

**City of Corpus Christi, Texas  
Engineering Services Dept.**



**Plan Preparation  
Standards  
and  
Contract Format**

**Last Revision: December 2004**

**Engineering Services Department**

**Plan Preparation Standards**  
**&**  
**Contract Format**

**~ Table of Contents ~**

**Tab One.....General Instructions**

**Tab Two.....City of Corpus Christi  
Plan Preparation Standards**

**Tab Three.....SECOMA**

**Tab Four.....Small A/E Contract Package**

**Tab Five.....Large A/E Contract Package**

**Tab Six.....Contract (Front End)  
Documents**

**Tab Seven ..... Small Construction Contract**

**December 2004**



**GENERAL**  
**INSTRUCTIONS**

# **City of Corpus Christi Plan Preparation Standards**

## **Table of Contents**

### **GENERAL INSTRUCTIONS**

- A. Monthly Status Report
- B. Property & Land Acquisition Division
- C. Informational Pre-Construction Meeting Format
- D. Bid Tabulation Samples

**MONTHLY**  
**STATUS REPORT**

# MEMORANDUM

**TO:** Consultants

**FROM:** Joe F. Trejo, P. E.  
Major Projects Engineer

**SUBJECT:** MONTHLY STATUS REPORT

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Please prepare monthly status reports for review updates. This will greatly aid the City in keeping all projects on track and help coordinate all activities for the operating departments. If you have any questions, please do not hesitate to call. The reports are to be brief, and are to be emailed when ready. Please try to keep to one (1) page maximum. Please submit by the 5<sup>TH</sup> of each month on your particular active project until completion.

**CONSULTANT  
MONTHLY STATUS REPORT**

Consultant: \_\_\_\_\_

Date: \_\_\_\_\_

Project Name (Per Contract): \_\_\_\_\_

City Project No.: \_\_\_\_\_ Consultant Project No.: \_\_\_\_\_

Month: \_\_\_\_\_, 200\_\_

Progress Last Month:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Anticipated Progress This Month:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Unusual Delays:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Action Items: \_\_\_\_\_ Responsible Party: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

Percent Complete: \_\_\_\_\_

Orig. Design Completion: \_\_\_\_\_

Preliminary Phase: \_\_\_\_\_

Amended Date: (if any): \_\_\_\_\_

Design Phase: \_\_\_\_\_

Bid Phase: \_\_\_\_\_

Construction Phase: \_\_\_\_\_



## E-Mail Address Listing

Please use the following E-Mail addresses to distribute your monthly reports to the various departments.  
**Have a separate Attachment in your e-mail for each project you may have with the City.**

### American Bank Plaza Conv. Center & Arena (SMG)

Marc Solis - marcs@cctexas.com  
Larry Stonecipher - larryst@cctexas.com

### Aviation

Dave Hamrick - daveh@cctexas.com  
Roy Rodriguez - roelr@cctexas.com  
Ralph Zapata - ralphz@cctexas.com  
Victor Gonzalez - victor@cctexas.com

### Development Services

Barbara Bailey - barbarab@cctexas.com  
Mary Frances Teniente - Teniente@cctexas.com  
Vernon Wuensche - vernonw@cctexas.com  
Charles Baish - charlesb@cctexas.com  
Cristina Fratila - cristinaf@cctexas.com

### Environmental Department:

Kim McGuire - kimm@cctexas.com

### Fire Department:

JJ Adame - jja@cctexas.com  
Richard Hooks - rh@cctexas.com  
Andy Cardiel - andyc@cctexas.com  
Eloy Ceballos - ecaballos@cctexas.com

### Gas Department:

Debbie Marroquin - debbiem@cctexas.com  
David Flores - davidf@cctexas.com  
Keith Rodriguez - keithr@cctexas.com

### Health Department:

Annette Rodriguez - annetter@cctexas.com  
Larry Jones - lajones@cctexas.com  
Mike Hacke - hacker@cctexas.com  
Angelica Castanon - castanon@cctexas.com  
Michael Silvers - silvers@cctexas.com

### Engineering Projects Department:

Angel Escobar - angele@cctexas.com  
Joe Trejo - joet@cctexas.com  
Kevin Stowers - kevin@cctexas.com  
Joe Cavalier - joec@cctexas.com  
Velma Rios - velmar@cctexas.com  
Randal Stivers - randals@cctexas.com  
Lynda Sutherland - lyndas@cctexas.com  
John Moses - johnmo@cctexas.com  
Sonny Garza - eusebiog@cctexas.com  
CJ Rodriguez - rodr@cctexas.com  
Ricardo Guzman - ricardog@cctexas.com  
Guadalupe Rocha- guadalupemr@cctexas.com  
Jerry Shoemaker - jerrys@cctexas.com  
Edwardo Ochoa - edwardoo@cctexas.com  
Rachelle Parry - rachelle@cctexas.com  
Jeremy Vernon - jeremyv@cctexas.com  
Lee Keller - leek@cctexas.com  
Kent Power - kentp@cctexas.com  
Alice Lopez - alicel@cctexas.com

### Library:

Herbert Canales - herbc@cctexas.com

### Museum of Science and History

Rick Stryker - ricks@cctexas.com

### Neighborhood Services

#### (CDBG)

Jonathan Wagner - jonathanw@cctexas.com  
Gloria De Leon - gloried@cctexas.com

### Park and Recreation Department:

Sally Gavlik - sallyg@cctexas.com  
Lynda Hodge - lindah@cctexas.com  
Peter Davidson - peterd@cctexas.com  
Art Sosa - arts@cctexas.com  
Ray Curran - rayc@cctexas.com

### Police:

Pedro Alvarez - petea@cctexas.com  
Kenneth Bung - kenb@cctexas.com

### Streets & Solid Waste Services Dept.:

Jeff Kaplan - jeffk@cctexas.com  
Lawrence Mikolajczyk - lawm@cctexas.com  
Andy Leal - andyl@cctexas.com

### Storm Water Department:

Valerie Gray - valerieg@cctexas.com  
Ed Leonard - edgarl@cctexas.com  
Ernest Chavez - ernestc@cctexas.com  
Aurora Parlamas - aurorap@cctexas.com  
Peggy Sumner - peggys@cctexas.com

### Wastewater Department:

Foster Crowell - fosterc@cctexas.com  
Johnny Perales - johnnyp@cctexas.com  
Tom Bacon - tomb@cctexas.com  
Harish Shah - harishs@cctexas.com  
Cliff Beaber - cliffb@cctexas.com

### Water Department:

Ed Garaña - edg@cctexas.com  
Danny Ybarra - danny@cctexas.com  
Mucio Garza - muciog@cctexas.com  
Frank Rodriguez - frankr@cctexas.com  
Fred Peña - fredp@cctexas.com  
Richard Harp - Richardh3@cctexas.com

**PROPERTY & LAND**  
**ACQUISITION**  
**DIVISION**

## PROPERTY & LAND ACQUISITION DIVISION

### Minimum requirements for Parcel Maps:

1. Print on 8 ½ by 11 inch paper. Vertical (or portrait) format preferred.
2. Place north arrow on upper, right hand corner of each page and on all successive drawings.
3. Tie in the Point of Beginning to Section corners, lot lines, or other data referenced in the deed information supplied, and per Texas Board of Professional Surveying regulations.
4. Include the following information for the subject parcel being described (i.e. easement, right-of-way, etc.):
  - a. Point of Beginning.
  - b. Bearings and distances for all sides.
  - c. Iron rods set or found. Include diameter of rod.
  - d. Cross hatch or shade the parcel being described.
  - e. Show all existing easements adjacent to, intersecting, or abutting the parcel.
5. For the parent tract or lot that the parcel is taken from, show the following information:
  - a. Legal description
  - b. Owner(s) name.
  - c. Recording data (i.e. Volume & page, Document No., etc.)
  - d. Distance of the new right-of-way line to any adjacent buildings or structures.
6. Other general items to include:
  - a. Parcel Number. If parcels are abutting and have identical ownership, use successive numbering such as 1A, 1B, 1C, etc.
  - b. Area calculations.

Total Tract:	_____	SF
Acquired Area:	_____	SF
Remainder:	_____	SF

- c. Scale of drawing.
  - d. Legend of all symbols used.
  - e. Name all adjacent streets, roads, and highways. Show centerline and right-of-way width.
  - f. Date of any revision and type of revision.
  - g. Date of survey, surveyor's certifications, signature, and professional registration seal.
  - h. Surveyor's title block in lower right corner if possible.
  - i. General notes if needed (such as – flood zones, etc.)
7. General Project Map showing all parcels to be acquired in reference to adjacent street, etc. (strip map).
    - a. Existing Right-of-way.
    - b. Proposed Right-of-way.
    - c. Land ownership.

- d. Parcel recording data (provide parcel identification to be acquired; after acquisition, revise and update to include recording data.)
- e. Easements.
- f. Previous acquired easements/ right-of-way by prior instrument as needed.
- g. Lot/block subdivision designation.

## **EASEMENTS, RIGHTS OF WAY AND LAND ACQUISITION TASKS**

### **CLARIFICATION FOR THE STANDARD CONTRACT PART B, ADDITIONAL SERVICES, PARAGRAPHS 2 [RIGHT OF WAY] AND 3 [TOPOGRAPHIC SURVEY]**

1. Consultant will provide a parcel strip map, indicating all information in electronic format plus a one half size hard copy
2. City Land Acquisition [LA] will utilize the strip map to determine the ownership of adjacent properties using tax rolls, via computer, of the most current owners, and obtain a copy of the most current deed.
3. City LA will transfer a copy of the most current deed to the Consultant.

### **END OF CITY LAND ACQUISITION RESEARCH FOR PROJECT**

4. Consultant completes the research to provide metes and bounds with Exhibit, sealed by RPLS
5. Consultant will identify properties that will require Right-of-Entry [ROE] forms.
6. City LA will prepare the Right of Entry [ROE] forms & letters, and mail them.
7. After ROEs are received, City LA will transmit them to the Consultant
8. Consultant can then conduct surveying, staking, geotechnical, etc. work.
9. Consultant will provide a preliminary Parcel strip plat of each individual taking (w/metes & bounds description) to City LA at Design Memorandum submission.
10. City LA will prepare introductory letter to the owners, attaching the preliminary Parcel Plat (with metes & bounds), to initiate the appraisal process.
11. Consultant will perform complete research for deed/title discrepancies to provide Parcel plats and strip maps, with RPLS seal.
12. Before the 60% design submittal, Consultant will provide the sealed Parcel Maps to City LA
13. City LA will proceed with the acquisition instruments.
14. Consultant will proceed with design completion.

**INFORMATIONAL**  
**PRE-**  
**CONSTRUCTION**  
**MEETING**  
**FORMAT**

**PRE-CONSTRUCTION MEETING**

PROJECT: \_\_\_\_\_  
CONTRACTOR: \_\_\_\_\_  
DATE: \_\_\_\_\_  
CONSULTANT: \_\_\_\_\_

**TOPICS OF DISCUSSION**

1. Project Scope:

**Award:** .....

**Total Base Bid:**.....

2. Project Coordination:

**City**

- a. City Project Manager: Ángel Escobar, P.E. (361/880-3506)
- b. City Asst. Proj. Managers: Construction Engineer (361/880-3555)
- c. City Operating Department: \_\_\_\_\_
- d. City Inspection: \_\_\_\_\_
- e. Consultant Project Engineer: \_\_\_\_\_

**Contractor**

- f. Spokesperson: \_\_\_\_\_
- g. Field Supt. (must be present): \_\_\_\_\_

h. After Hours Numbers (2 people with pagers/cell phone):

i. Sub-Contractors (with proof of workers comp on file)

j. Work Schedule (must be submitted prior to meeting)

3. Contract Status:

Work Order Issued: \_\_\_\_\_  
Start Date on/or Before: \_\_\_\_\_

4. Contract Time:

\_\_\_\_\_ **Calendar Days**

Sufficient time has been allotted for this project.

5. Liquidated Damages:

\$\_\_\_\_\_ per day for each day in excess of \_\_\_\_\_ days.

6. Minority/Minority Business Enterprise Participation:

Minority Participation: \_\_\_\_\_ %  
MBE Participation: \_\_\_\_\_ %

7. Workers Compensation Coverage for Building or Construction Projects for Government Entities (Includes all Sub-Contractors)

Contractor's attention is directed to **Notice to Contractors - B, Page 1** of the Contract documents. As outlined therein, the Contractor shall be responsible for submitting documentation as proof of workers compensation coverage for any and **all sub-contractors** used on the project site. The Project Inspector will be observing the job site to determine compliance. **Any violations will result in work stoppage for the sub-contractor and withholding of payments to the Contractor, until documentation is submitted.**

8. Change Orders:

- a. Perform no unauthorized Change Order work until it is signed off by the Director of Engineering and/or City Council.
- b. Change Orders will be prepared by the City Engineer. Consultant Project Engineer shall provide scope, Contractor shall furnish cost estimates.
- c. Change Orders over \$25,000 will require Council action, which requires approximately four weeks to get on the Council agenda in addition to the review time required by the Director of Engineering.
- d. Change Orders under \$25,000 can be approved by the Director of Engineering and normally take approximately two weeks after submittal.
- e. Under rare instances, i.e., life or property threatening, an emergency Change Order over \$25,000 can be verbally approved by the City Manager with the proper-documentation following up as soon as possible.
- f. Total amount of all Change Orders shall not exceed 25% of original contract price. (25% of Contract Award =\$)

9. Contractor's Claim for Damages:

Attention is directed to Paragraph B-6-12 of the General Provisions of the Contract, which states that any claims must be filed in writing within 3 days of occurrence, and submitted to the Project Inspector.

10. Wage Rates and Federal Requirements:

- a. All applicable Federal wage rates and regulations apply.
- b. Bi-Weekly submittal of certified Contractor and Sub-Contractor payrolls for work performed on the project are due within 10 calendar days of work reported. These must be submitted to Ms. Alice Lopez in the Construction Activity office, 1317 Mestina St., Corpus Christi, Texas 78401. Payrolls must be certified and contain employee name, social security number, classification, gross pay, deductions and net pay. Periodic interviews will be conducted by the City with field workers on the job site to determine wage compliance. (Attachment "C")
- c. **Monthly payments will be withheld if payrolls are not submitted by cut off day for payment request submitted.**

**PRE-CON MEETING**

Project - Date

Page 2 of 5

Last Revision: Dec 2004



11. Field Office:

This project **does not require** a field office.

The Contractor must furnish the City Engineer or his representative with a field office at the construction site. The field office must contain at least 120 square feet of useable space. The field office must be air conditioned and heated and must be furnished with an inclined table that measures at least 30" x 60" and two (2) chairs. The Contractor shall move the field office on the site as required by the City Engineer or his representative. The field office must be furnished with a telephone (with 24 Hour per day answering service) and FAX machine paid for by the Contractor. There is no separate pay item for the field office.

Contractor is responsible for all required Building Department permits for the field office.

12. Project Signs:

This project **does not require** any project signs.

The Contractor must furnish and install \_\_\_ Project sign(s) as outlined in Special Provision A-21 of the contract documents. The sign(s) must be installed before construction begins and will be maintained throughout the Project period by the Contractor. The location of the sign(s) will be determined in the field by the City Engineer.

13. Storm Water Pollution Prevention Plan (SWPPP) (As applicable):

Attention is directed to Sections A-14 and A-42 of the Special Provisions and to any project-specific plans and specifications related to SWPPP. Failure to comply with any of the aforesaid requirements may result in the issuance of a Stop Work Order or the withholding of partial estimates until compliance is attained.

14. Testing:

This project **does not require** any construction materials testing.

All construction materials testing for this project shall be conducted by \_\_\_\_\_. The cost of the laboratory testing shall be paid for by the City. In the event that any test fails, that test must be done over after corrective measures have been taken, and the cost of retesting shall be paid for by the Contractor and deducted from the payment to the Contractor.

The Contractor shall assume all responsibility for seeing that all applicable certifications are provided to the Engineer on required equipment or installation.

15. Monthly Estimates:

- a. Submit Contractor Schedule of Values.
- b. Estimates shall be prepared by the Construction Inspector. The Inspector shall review the estimates with the Contractor for agreement/concurrence prior to submission to City Construction Engineer, for processing and payment. In the event that the Inspector and Contractor cannot agree, City Construction Engineer will be the arbitrators and final word.
- c. According to Special Provision A-40, Contractors can be paid for non-perishable materials on hand stored at the site, provided that invoices are furnished to the City for verification of the material value; and provide documents, satisfactory to the City, that show that the material supplier has been paid for the materials delivered to the work site.
- d. **Estimate will not be processed if payrolls are not included.**
- e. Only one monthly estimate will be processed per 30 day calendar period.

**PRE-CON MEETING**

Project - Date

Page 3 of 5

Last Revision: Dec 2004

16. Limits of Work and Storage Areas:

- a. Access to site through approved routes. Damage due to construction operations shall be the responsibility of the General Contractor.
- b. Security against theft or vandalism is Contractor's responsibility.

17. Submittals

The Contractor shall prepare and submit the following sets to the Consultant Project Engineer for review and approval.

Upon approval the following distribution by the Consultant Project Engineer will occur (Engineer will submit cover letter with enclosure):

- a. Submit \_\_\_ sets with cover letter to **Construction Activity**.
- b. Submit \_\_\_ sets to the City Operating Department located at
- c. Consultant Project Engineer shall keep \_\_\_ sets
- d. Contractor shall keep \_\_\_ sets for his use, including Sub-Contractors
- e. Contractor shall keep **one** approved set at the project site at all times.

A total of \_\_\_\_\_ sets of submittals will be required for this project.

**Submittals procedures shall be closely monitored by the Consultant Project Engineer. Any delays shall be immediately reported to **City Construction Engineer** and 'Angel Escobar, Director of Engineering.**

18. Cooperation with Public Agencies:

A list of phone numbers is furnished in Paragraph A-11 of the Special Provisions. The Inspector will assist the Contractor in coordinating activities with the agencies and utilities.

19. Use of a Section or Portion of the Work:

Contractor's attention is directed to Item B-6-17 of the General Provisions and Requirements of the contract documents, which states:

"Wherever, in the opinion of the Engineer, any section or portion of the work or any structure is in suitable condition, it may be put into use upon the written order of the Engineer, and such usage shall not be held to be in any way an acceptance of said work or structure or any part thereof or as a waiver of any of the provisions of these specifications or the contract pending final completion and acceptance of the work; all necessary repairs and removals of any section of the work so put into use, due to defective materials or workmanship or to operations of the Contractor, shall be performed by the Contractor at his own cost and expense."

20. Project Close Out Requirements:

- a. Contractor and Sub-Contractor payrolls must be up to date and final payrolls submitted, including weeks where work was not performed (i.e., painter had 3

week schedule; worked 1 week, off next week, worked final week = 3 payrolls; 2 payrolls certifying work performed and 1 payroll certifying work not performed).

**PRE-CON MEETING**

Project - Date

Page 4 of 5

Last Revision: Dec 2004

- b. Final affidavit from Contractor indicating all bills for labor, materials, equipment, etc. have been paid in full, signed by an officer of the company and notarized. Any exceptions should be listed where release of retainage are involved. (Attachment "A")
- c. City check-list is attached for reference. (Attachment "B")  
All construction documentation requested must be submitted before final payment and acceptance of project.
- d. Contractor must submit letter of compliance with MBE goals.  
This second letter must be submitted before the final payment and acceptance of project to illustrate that the intended MBE goals were achieved.
- e. Construction Status Reports (Consultant, as applicable). (Attachment "D")

21. Permit Documentation:

- a. No work will be permitted on site until the Contractor provides proof that the permits required to perform work on the site have been obtained. The Contractor's first pay request **will not be processed** until permit information is verified by the Construction Inspector.
- b. The Construction Engineer will not release the final pay request unless a copy of the "Green Tag" from Building Inspection is attached. (A "Green Tag" signifies job is approved by the Development Services Department.)

22. Items for Discussion per Consultant Project Engineer/Architect:

Agenda or outline of items to be addressed by Project Engineer/ Architect as they pertain to the subject project.

ATTACHMENTS (AS APPLICABLE TO JOB):

- Attachment "A" – FINAL AFFIDAVID
- Attachment "B" – CITY CHECK LIST
- Attachment "C" – PAYROLL FORM
- Attachment "D" – CONSTRUCTION STATUS REPORT
- Attachment "E" – REQUEST FOR COMPOST/MULCH
- Attachment "F" – WATER SERVICE (FIRE PROTECTION SYSTEM BACKFLOW PREVENTION ASSEMBLY) PERMIT APPLICATION

AFFIDAVIT AND WAIVER OF LIEN BY CONTRACTOR

STATE OF TEXAS

COUNTY OF \_\_\_\_\_

Personally appeared before me, the undersigned authority in and for said State and County, \_\_\_\_\_ (Name/Title) of

\_\_\_\_\_ (Name of Company) which firm is hereinafter called "Contractor", who being duly sworn states on oath that he has personal knowledge of the following:

1. Contractor has paid in full all debts, obligations, and liabilities (including, without limitation, all debts, obligations, and liabilities for labor, materials, equipment or services, and for all local, state or federal taxes) which have been incurred by Contractor, or which are claimed by others to have been incurred by Contractor, or which have arisen in conjunction with work done, or labor, materials, equipment or services furnished by Contractor under contract with the City of Corpus Christi on the \_\_\_\_\_

(Project Name)

2. This Affidavit and Waiver is made and given upon and in exchange for final payment of all sums due Contractor by the City of Corpus Christi under the terms of said contract. In consideration therefor, Contractor waives and releases any and all claims and any and all liens or rights to liens which Contractor has or may have against the City of Corpus Christi for amounts due and owing to Contractor by virtue of Contractor furnishing the labor, materials, equipment or services referred to above.

The above statements are made by \_\_\_\_\_ (Name) of \_\_\_\_\_ (Name of Company) individually and on behalf of the Contractor.

\_\_\_\_\_  
(Name and Title)

\_\_\_\_\_  
(Company name)

Sworn to and subscribed before me on \_\_\_\_\_ (Date).

\_\_\_\_\_  
Notary Public  
State of Texas

\_\_\_\_\_  
Commission Expires

## PROJECT ACCEPTANCE PROCEDURES CHECK LIST

Project Name/Number: \_\_\_\_\_

Contractor: \_\_\_\_\_

Inspector: \_\_\_\_\_

Pre-Con Mtg. Date: \_\_\_\_\_ Final Inspect. Date: \_\_\_\_\_

**(for City use only)**

Date    Initial

\_\_\_\_\_ (1) Final Inspection (Contractor shall have red lined set ready to submit to City with all corrections/ notes):

(Name of Person attending & responsible)

Contractor	_____
Inspector (City/Consultant)	_____
A/E Consultant	_____
Operating Dept. Rep.	_____
City Engineering Rep.	_____
Mfg. Rep. (if applicable)	_____

\_\_\_\_\_ (2) Inspector prepares final quantities, contractor evaluation form, and project summary.

\_\_\_\_\_ (3) Inspector/Engineer verifies that all **submittals, payrolls, Inspection Reports, As-Builts, O&M Manuals (in electronic format as required), SCADA documentation, and other Field Information** are complete.

\_\_\_\_\_ (4) Contractor reviews and agrees to final quantities or differences agreed upon by Contractor and Inspector.

\_\_\_\_\_ (5) Final estimate reviewed by City Construction Engineer.

- \_\_\_\_\_ (6) City Construction Engineer submits to Engineering Administrative Asst., the final estimate and Contractor evaluation form (attached) and this form (Project Acceptance Procedures Check List).
- \_\_\_\_\_ (7) Final payment checklist:
  - (a) Affidavit that all bills have been paid, "Waiver of Lien"  
 \_\_\_\_\_  
 (Name of Responsible Party)
  - (b) Submittal of all remaining payrolls  
 \_\_\_\_\_  
 (Name of Responsible Party)
  - (c) Submittal of MBE letter on what Contractor has actually subcontracted through end of project  
 \_\_\_\_\_  
 (Name of Responsible Party)
  - (d) If CDBG project, all federal (yellow) forms completed and submitted  
 \_\_\_\_\_  
 (Name of Responsible Party)
- \_\_\_\_\_ (8) Final acceptance memo prepared by Administrative Asst.
- \_\_\_\_\_ (9) Administrative Asst. reviews for completeness, funding availability, prepares financial paperwork (transfers, adjustments)
- \_\_\_\_\_ (10) Administrative Asst. submits to Director of Engineering Services/Operating Department Head for approval and forwarding to Asst. City Manager
- \_\_\_\_\_ (11) Final acceptance memo returned from Asst. City Manager
- \_\_\_\_\_ (12) Authorization for Payment (AFP) prepared and submitted to Accounting Department

- \_\_\_\_\_ (13) Contractor receives final payment after City Council (if required) or Asst. City Manager accepts project
- \_\_\_\_\_ (14) Administrative Asst. sends letter to Contractor informing him when one year warranty date begins.

# NOTICE TO ALL EMPLOYEES



## Working on Federal or Federally Financed Construction Projects

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### MINIMUM WAGES

You must be paid not less than the wage rate in the schedule posted with this Notice for the kind of work you perform.

### OVERTIME

You must be paid not less than one and one-half times your basic rate of pay for all hours worked over 40 a week. There are some exceptions.

### APPRENTICES

Apprentice rates apply only to apprentices properly registered under approved Federal or State apprenticeship programs.

### PROPER PAY

If you do not receive proper pay, contact the Contracting Officer listed below:

LABOR RELATIONS SPECIALIST  
U.S. DEPT. OF HOUSING AND  
URBAN DEVELOPMENT  
800 DOLOROSA, ROOM 303  
SAN ANTONIO, TX 78207-4563  
(210) 229-6805

or you may contact the nearest office of the Wage and Hour Division, U.S. Department of Labor. The Wage and Hour Division has offices in several hundred communities throughout the country. They are listed in the U.S. Government section of most telephone directories under: U.S. Department of Labor  
Employment Standards Administration







Date: \_\_\_\_\_

**Consultant  
(Construction Status Report)**

Project Name:	Contractor's Name:	Sub-Contractors:
Consultant Name:	City Proj. No.	Consultant Proj. No.
Days Charged:	Total Days Used:	

**A.) Project Progress:**

(Contractors Update, Certified Payrolls, O & M's, As-builts, Any items needing to be resolved, Etc.)

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

**B.) Anticipated Progress:**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

**C.) Unusual Delays/Recommendation:**

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**D.) Comments:**

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**CONTACT PERSON:**  
Tony Benavides – Landfill Manager  
(361) 826-1631

## City of Corpus Christi Solid Waste Service

### REQUEST FOR COMPOST/MULCH

Date: \_\_\_\_\_ Driver: \_\_\_\_\_  
Unit #: \_\_\_\_\_ Time: \_\_\_\_\_  
Dept: \_\_\_\_\_ Material: \_\_\_\_\_

The four types of compost/mulch material that is currently offered at the J.C. Elliott Landfill are:

**#1: Fresh Grid (mulch) .....**

Green material that has not been screened or cooked. Soft spongy material excellent for pathways.

**#2: Fresh Grid/One Screening (mulch) .....**

Green material that has been screened once but has not been cooked. Soft spongy material excellent for pathways or playground cover.

**#3: 50/50 Compost/Mulch .....**

Brown material. Cooked in windrows for approximately 90 days. Material is 50% mulch and 50% compost. Material has not been screened so therefore it has large wood pieces combined with composed material. It should be noted that at this point material has some contaminants (plastic) are present and material is not recommended for final cover.

**#4: Final product .....**

Dark brown material. Cooked in windrows for approximately 90 days. Material has been screened and is mostly compost. Excellent for final cover for gardens, plants, and other vegetation.

Ordered by: \_\_\_\_\_ Title: \_\_\_\_\_

Signature: \_\_\_\_\_

**WATER SERVICE**  
**FIRE PROTECTION SYTEM**  
**BACKFLOW PREVENTION ASSEMBLY**  
**APPLICATION FOR PERMIT**

City of Corpus Christi  
Water Department 2726 Holly Drive  
P.O. Box 9277 78415  
Corpus Christi, Texas 78469-9277

Utility Contractor (Company Name): \_\_\_\_\_

Utility Contractor Contact: \_\_\_\_\_ Phone: \_\_\_\_\_

Fire Marshall's Office (Initials): \_\_\_\_\_ Date: \_\_\_\_\_

**ATTENTION: WATER UTILITIES ENGINEERING** – Formal notice is hereby given that:

**Fire Protection System Contractor** \_\_\_\_\_ **Phone** \_\_\_\_\_ **SCR #** \_\_\_\_\_

Proposes to install a backflow Prevention Assembly, in conjunction with a Fire protection System/Fire Line, On the following property:

**Facility name/Description:** \_\_\_\_\_

**Facility Address (Street, Zip):** \_\_\_\_\_

**Subdivision/Tract:** \_\_\_\_\_ **Block:** \_\_\_\_\_ **Lot (s):** \_\_\_\_\_

All backflow prevention assembly (ies) that are installed will be constructed and maintained in accordance with governing laws. A certified backflow prevention assembly must test the backflow prevention assembly (ies) initially and on a yearly basis, thereafter. Backflow prevention assembly tester may test and repair assemblies on fire lines, only is they are permanently employed by an Approved Fire Protection System Contractor. Upon initial testing, the testing maintenance report and two copies of the testing maintenance report shall be turned in to the Fire department. The location and description of the backflow prevention assembly (ies) is/are more fully described by the drawings attached to this notice and/or in the application for "Automatic Sprinkler, Standpipe, and Fire-Lines Permit", filed separately. All work shall be performed in accordance with City of Corpus Christi Water Department guidelines. In the event that the property owner, or future property owner, fails to comply with the requirements as set forth herein, the City Water department may take such action, as it deems appropriate to compel compliance.

Construction of the proposed Backflow Prevention Assembly(ies) will begin on or after the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

**Signed (Proper Owner):** \_\_\_\_\_ **Print Name:** \_\_\_\_\_

**Title:** \_\_\_\_\_ **Phone:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Property Owner's Mailing Address:** \_\_\_\_\_

**City:** \_\_\_\_\_ **State:** \_\_\_\_\_ **Zip:** \_\_\_\_\_

**DO NOT WRITE BELOW THIS LINE**

The City of Corpus Christi water department offers no objection to the location of the proposed backflow prevention assembly (ies) as shown by the accompanying drawing(s) and notice except as noted and initialed on the documents.

The name of the Water department Inspector assigned to this project is: \_\_\_\_\_

Signed: \_\_\_\_\_ Date: \_\_\_\_\_ Permit #: \_\_\_\_\_

Fred Pena, Engineer III, 857-1808, Water Utilities Bldg., 2726 Holly Drive, fredp@cctexas.com

**ATTACHMENT "F"**

Application for Permit  
Page 1 of 13  
Last Revision: Dec 2004

# FIRE-LINE/WATER SERVICE PACKAGE

## BACKFLOW PREVENTION ASSEMBLY AND/OR TAPPING-SLEEVE, VALVE, & WATER SERVICE PIPE ASSEMBLY

### I. General

1. **Work Designation** –Both Utility and Fire Protection System Contractors shall be subject to Section I, General, of this “Fire-Line/Water Service package”. The Fire Protection System Contractor shall be responsible for Section II, and the Utilities Work Contractor shall be responsible for Section III. Contractors must be qualified and/or certified in their respective fields.
2. **Permits** - No work shall start on the installation of any water service assemblies until all of the approvals and permits have been obtained from the appropriate City Departments:
  - a. Fire Prevention Bureau - Permit ALWAYS REQUIRED on Fire Protection Systems
  - b. Water Department – Permit ALWAYS REQUIRED on Meters of 3” or 4” and on Fire Protection Systems
  - c. Engineering Department – A “Street Cut Permit” shall be required whenever any City street is to be cut
  - d. Traffic Engineering Department – A “Traffic Control Plan” shall be required whenever any work is to be performed in a City right-of-way whether or not a City street is being cut.
3. **Fees** – This “Fire-Line/Water Service Package” Permit is free, but work shall not proceed without first having obtained it.
4. **Materials** – Unless specifically documented, the Contractor doing the work shall furnish all labor, equipment and material for a complete installation.
5. **Fire System Plans** - The Fire Protection System Contractor shall submit plans of the fire protection system to the Fire Prevention Bureau and shall obtain an “Automatic Sprinkler, Standpipe, & Fire-Lines Permit” prior to applying for a permit from the Water Department. At that time, the Fire Marshall’s Office shall initial the “Water Service Application for Permit”, to denote that they are aware of the project.
6. **Permit Application** – The Contractor shall submit four (4) complete sets of this package to the City of Corpus Christi Water Department, on 8 ½” x 11” format. Each set shall contain original signatures of the Owner or Owner’s authorized representative.
7. **Valid Permit** – This permit shall become void, and subject to the cancellation of utility services, if it is discovered that the information that was turned in on the application is false.
8. **Plans** – Four (4) sets of plans shall be submitted in separate binders, on 8 ½” x 11” paper, attached to the back of each of the permit applications. Drawings must be provided which depict the details about the proposed project, i.e.:
  - [1] location or vicinity map,
  - [2] site plan with work layout, showing vault orientation,
  - [3] pipe sizes, pipe layout, and pipe locations,
  - [4] specification sheets of the proposed double check detector valve.
9. **“As-Built” Drawings** – If any changes are made during field operations that vary from the proposed drawings, the Contractor shall submit, to the inspector, “as-built” drawings with the modified layout. Four (4) sets of drawings, on 8 ½” x 11”, must be turned in to the Inspector before inspections on this project are approved.
10. **Telephone Numbers** -

Water Department	857-1888	Engineering	880-3500
Fire Prevention Bureau	880-3953	Traffic Engineering	880-3540, or 3550
11. **Vehicular Loads** – If it is anticipated that either the Fire-Line Vault or the Meter Vault has, or will have, vehicular traffic loading, a Professional Engineer, incorporating the same components, shall design the vault affected.

Revised 07-30-01

## II. DOUBLE CHECK-DETECTOR BACKFLOW PREVENTION ASSEMBLY (DCDA)

1. **DCDA Requirement** – The Fire Protection System Contractor shall be responsible for installing the DCDA assembly (ies). The potable water supply shall be protected using a DCDA and shall be housed in an underground prefabricated concrete vault as specified in Exhibits “A1” through “A3”. If high-hazard protection is required (i.e. antifreeze loops, etc.) on any portion of the fire system, a Reduced Pressure Principle Backflow Prevention Assembly (RP) or an air gap shall be installed, as required by the Fire Official, in that portion of the fire system.
2. **DCDA Notification** - The Fire Official shall be notified at least twenty-four (24) hours prior to preparation for the testing of the DCDA Assembly (ies) and the Fire Protection System.
3. **Mechanical Rooms** – The only time that the DCDA will be permitted inside the building is when the Water Department determines that there is insufficient land space to install the prefabricated concrete vault as specified.
4. **Testing** – All backflow prevention assemblies shall be tested by a certified backflow prevention assembly tester, and two sets of a Testing Maintenance Reports shall be turned in to the Fire Prevention Bureau, before permanent water service is provided. Thereafter, the Owner of the property shall be responsible for having the tester re-certify all backflow prevention assembly (ies) on an annual basis, submitting one copy of the testing report to the Backflow Prevention Division of the Water Department.
5. **Registration Number** - The permit application for the installation of the DCDA shall include the Contractor’s “TEXAS STATE FIRE MARSHALL CERTIFICATE OF REGISTRATION NUMBER”.
6. **Variance to DCDA Requirements** – Approval for a variance must be made in writing, prior to making any changes. The Water Department shall approve proposed changes, during the permit application process, and the Fire Official shall approve field changes. Approved copies must be submitted to the Water Department for their records. Variances will be approved on a case-by-case basis, depending on the specific circumstances.
7. **Inspections of DCDA Work** - The Fire Prevention Bureau must inspect all work before the work is covered up. If the Inspector before covering does not approve the work, the work will have to be uncovered for the inspection to take place and before permanent water service is made available.
8. **Approved Materials** - All proposed material must be approved by the appropriate testing agencies and documentation of that fact must be submitted to the City Water Department during the Permit process.
9. **Specification** – The DCDA shall be Underwriters Laboratories listed, Factory Mutual approved, and USC approved. The assembly shall meet the requirements of ASSE Standard 1015, AWWA Standard C506, and USC Foundation for Cross Connection Control and Hydraulic Research.
10. **Construction** – The body of the DCDA shall be of either epoxy-coated ductile iron or stainless steel construction.
11. **Working Pressure** – The DCDA shall have a minimum working pressure of 150 psi.
12. **Gate Valves** – The gate valves on each side of the DCDA shall have an Outside-Stem-and-Yoke configuration, unless otherwise approved by the Fire Official.
13. **Concrete Vaults** – Pre-manufactured concrete vaults shall be built according to drawings in “Exhibits A1-A3”.
14. **Excavation** – Preparation for excavation shall be approximately 6-8 inches deeper than the vault depth, and 6-8 inches of gravel or crushed rock must be added to the entire bottom surface for drainage.
15. **Maintenance** – The Property Owner shall be responsible for maintaining the fire protection system and the pre-manufactured concrete vault.
16. **Vault Protection** – If there is a possibility for vehicular traffic to travel over the vault, the Water Department will require the installation of barrier protection. If a barrier cannot be installed, the Contractor shall hire a Professional Engineer to submit drawings of a Fire-Line Vault, with the same components as specified, designed to carry vehicular loading. The Water Inspector must approve the variance, before the work is begun.

### III. TAPPING-SLEEVE, VALVE, & SERVICE PIPE ASSEMBLY

1. **Tapping-Sleeve, Valve, & Service Pipe Assembly Requirement** – The Utility Work Contractor shall be responsible for installing the tapping-sleeve, valve, and service-pipe assembly in this section. The Contractor shall take steps to protect the drinking water. The work to be performed is specified in “Exhibit B1 through B4”.
2. **Notification** – The Water Department Inspector shall be notified at least twenty-four (24) hours prior to starting construction of the Tapping-Sleeve, Valve, & Service Pipe Assembly.
3. **Variance to Water Service** – Approval for a variance must be made in writing, prior to making any changes. The Water Department must approve all changes that need to be made to this portion of the permit application, before the changes are made, and approved copies must be submitted to the Water Department for their records. Variances will be approved on a case-by-case basis, depending on the specific circumstances.
4. **Wet Taps** - In the event that a “wet” tap has to be made on an existing City Water Main, the Contractor shall furnish and install the tapping gate valve, the tapping sleeve. The Contractor shall also provide a source of air power and lifting equipment for the City Tap Crew to tap the main through the tapping. The Contractor shall have the appropriate size excavation (see “Exhibit B2”) ready for the City Tapping Crew. The excavation shall be done in accordance with acceptable OSHA safety standards. The Contractor shall give the Water Department Inspector at least forty-eight (48) hours notice before the Tapping Crew is needed.
5. **“Extra-Time” Fees** - There shall be no charge from the City of Corpus Christi for the first two hours of the City Tapping Crew. After the first two hours, there shall be a charge of \$150.00 per hour. Time shall start when the City Tap Crew arrives. A check for “extra time”, payable to the City of Corpus Christi, shall be turned in to the Water Inspector, before approval of the inspection can be made.
6. **Inspections on Water Service Assembly** - The Water Inspector must inspect all work before the work is covered up. If the Inspector before covering does not approve the work, the work will have to be uncovered for the inspection to take place and before permanent water service is made available.
7. **City Valves** – No valve owned by the City of Corpus Christi Water Department shall be operated by other than City of Corpus Christi Department personnel, unless authorized by a representative of the City of Corpus Christi Water Department.
8. **Large Meters Require Vault** – Before the project is started, the Contractor shall obtain the meter size for the facility from the Water Department Meter Shop. Whenever meters sized less than 3” are required, the Water Department will install the meter box. Whenever 3” or 4” meters are needed for the facility, a meter vault (as specified in Exhibits B3 and B4) shall be installed by the Utility Contractor. All meters greater than 4” in size shall be installed above ground, as directed by the Water Department Inspector.
9. **Layout** – The general layout of the service pipe assembly is found in Exhibit B2. Note that the vault orientation will be site specific and must be considered while designing the project layout.
10. **Excavation** – Whenever a vault is required, preparation for excavation shall be approximately 6-8 inches deeper than the vault depth, and 6-8 inches of gravel or crushed rock must be added to the entire bottom surface for drainage.
11. **Maintenance** – The Property Owner shall be responsible for maintaining the pre-manufactured concrete vault.
12. **Vault Protection** – If there is a possibility for vehicular traffic to travel over the vault, the Water Department will require the installation of barrier protection, as required. If a barrier cannot be installed, the Contractor shall hire a Professional Engineer to submit drawings of a Meter Vault, with the same components as specified, designed to carry vehicular loading. The Water Department must approve the variance, before the work is begun.

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Revised 07-30-01

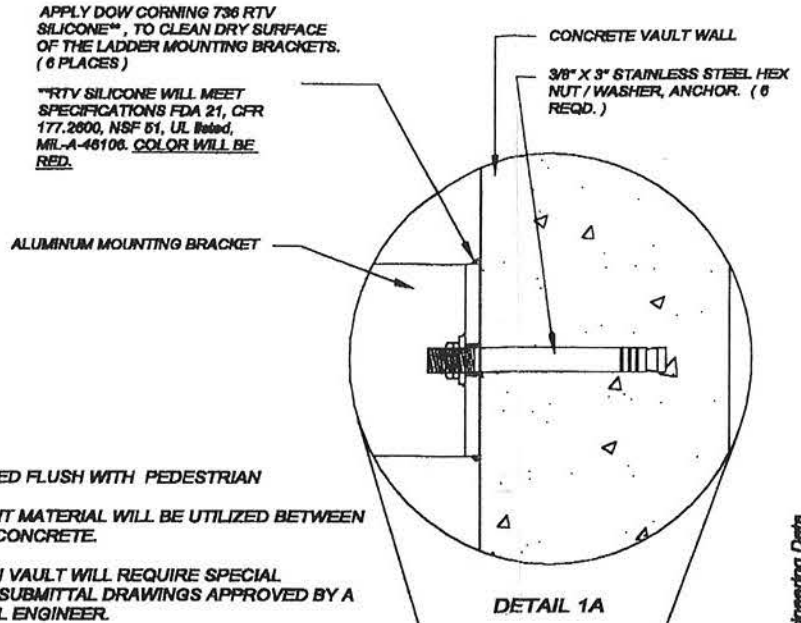
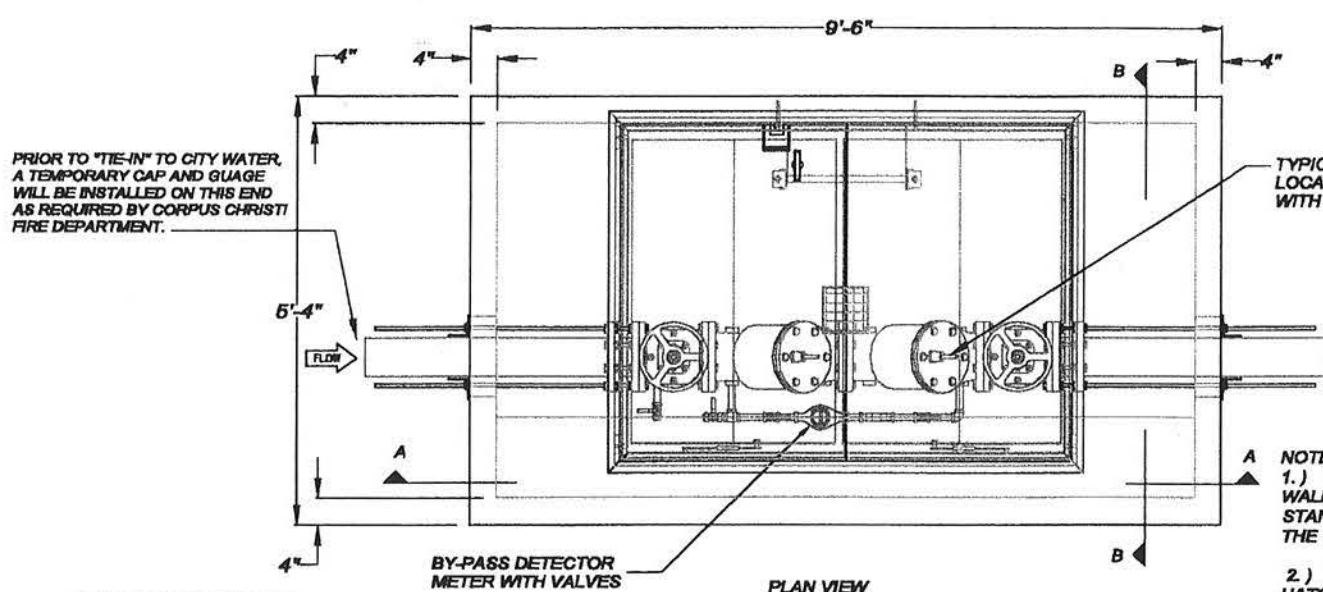


**ATTACHMENT "F"**

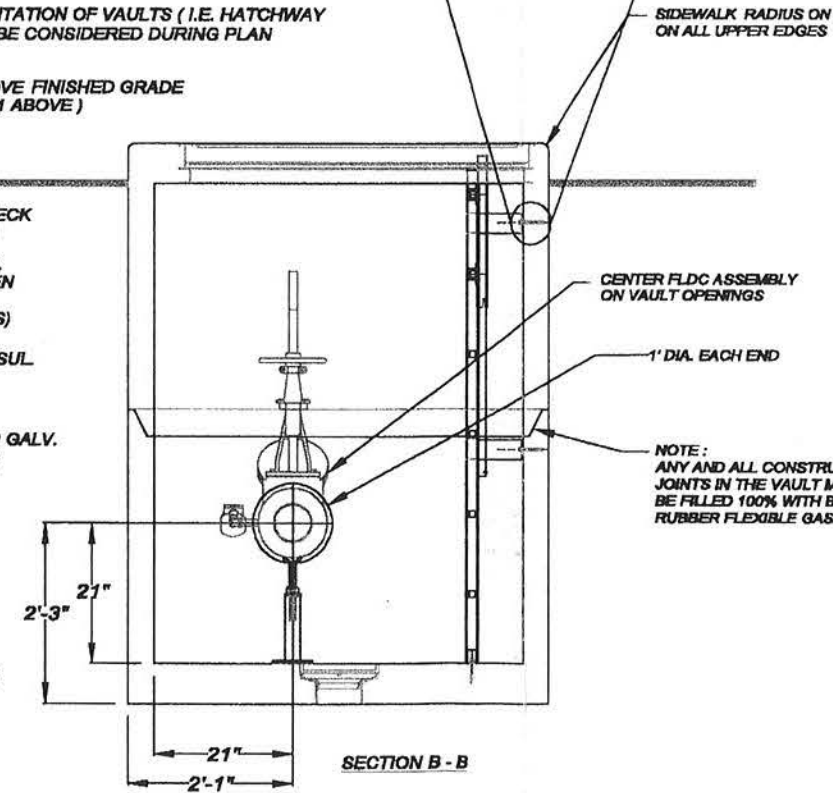
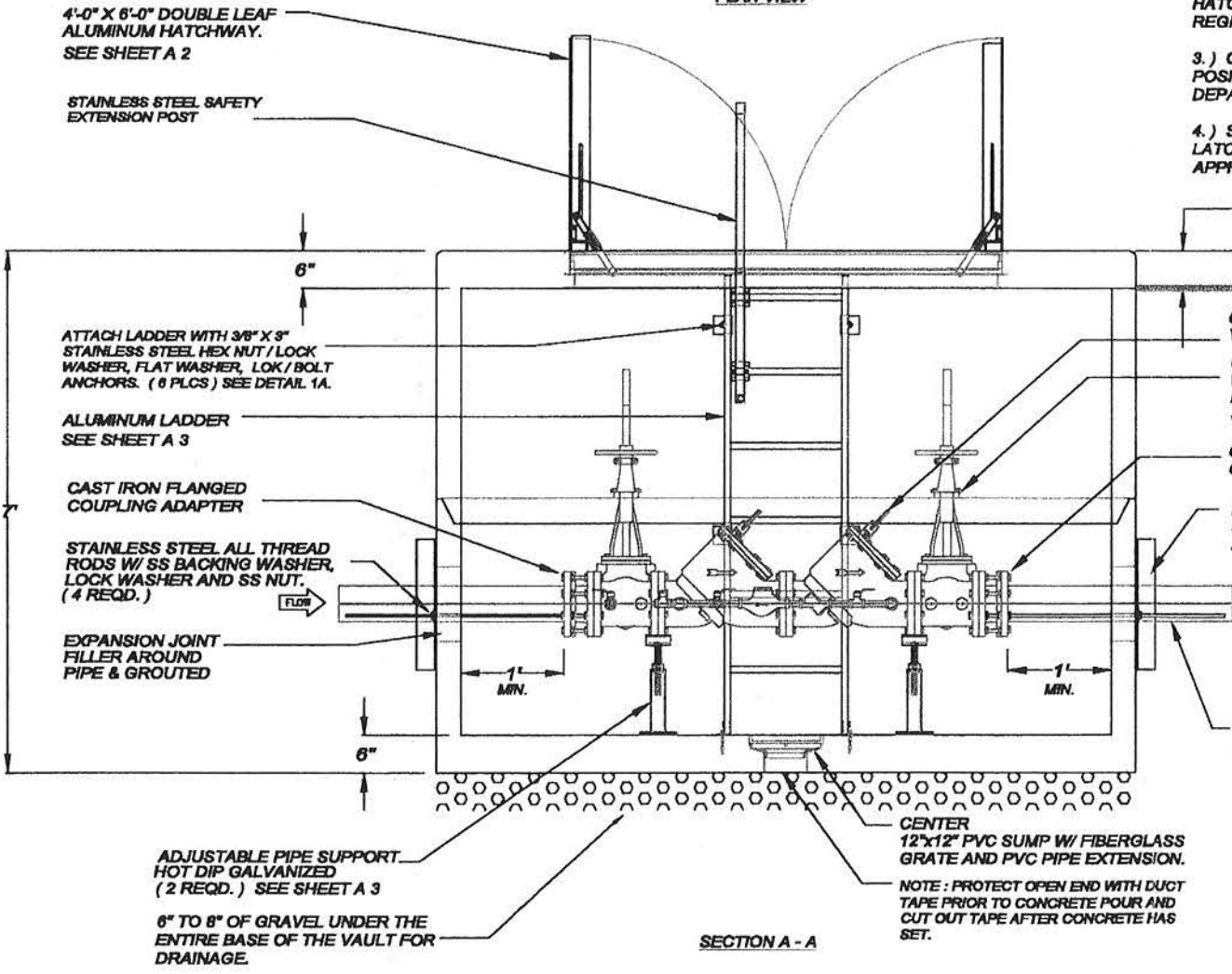
Fire-Line/Water Service Package

Page 5 of 13

Last Revision: Dec 2004



- NOTES:
- 1.) VAULT MAY BE INSTALLED FLUSH WITH PEDESTRIAN WALKWAYS. STANDARD EXPANSION JOINT MATERIAL WILL BE UTILIZED BETWEEN THE VAULT AND ADJACENT CONCRETE.
  - 2.) VEHICULAR TRAFFIC ON VAULT WILL REQUIRE SPECIAL HATCHWAY AND SEPERATE SUBMITTAL DRAWINGS APPROVED BY A REGISTERED PROFESSIONAL ENGINEER.
  - 3.) OS&Y GATE VALVES WILL BE CHAINED AND LOCKED IN THE OPEN POSITION, OR AS SPECIFIED BY THE CORPUS CHRISTI FIRE DEPARTMENT.
  - 4.) SEPARATION AND ORIENTATION OF VAULTS (I.E. HATCHWAY LATCH ORIENTATION) WILL BE CONSIDERED DURING PLAN APPROVAL.



VAULT SPECIFICATIONS:

SIDE WALLS:	4" - 4 X 4 X #4 WIRE
TOP:	6" - 4 X 4 X #4 WIRE WITH 4'-0" X 6'-0" DOUBLE LEAF ALUMINUM HATCHWAY SEE DRAWING B 4
BOTTOM:	6" - 4 X 4 X #4 WIRE
CONCRETE:	4000 psi - 600 lbs per cy ( 50% 5/8" pea gravel, 50% sand )
REINFORCEMENT:	ADD ADDITIONAL REINFORCEMENT AROUND HATCHWAY AND OPENINGS TO PREVENT CRACKING.

## 6" - 8" BACKFLOW PREVENTER DOUBLE CHECK DETECTOR ASSEMBLY

NOTE: GREY LINES ARE HIDDEN LINES.

Engineering Data

Field excavation and preparation shall be completed prior to delivery of assembly. Use dimensional data as shown. Pipe, valves and fittings of the assembly are approved by one or more of the following associations:



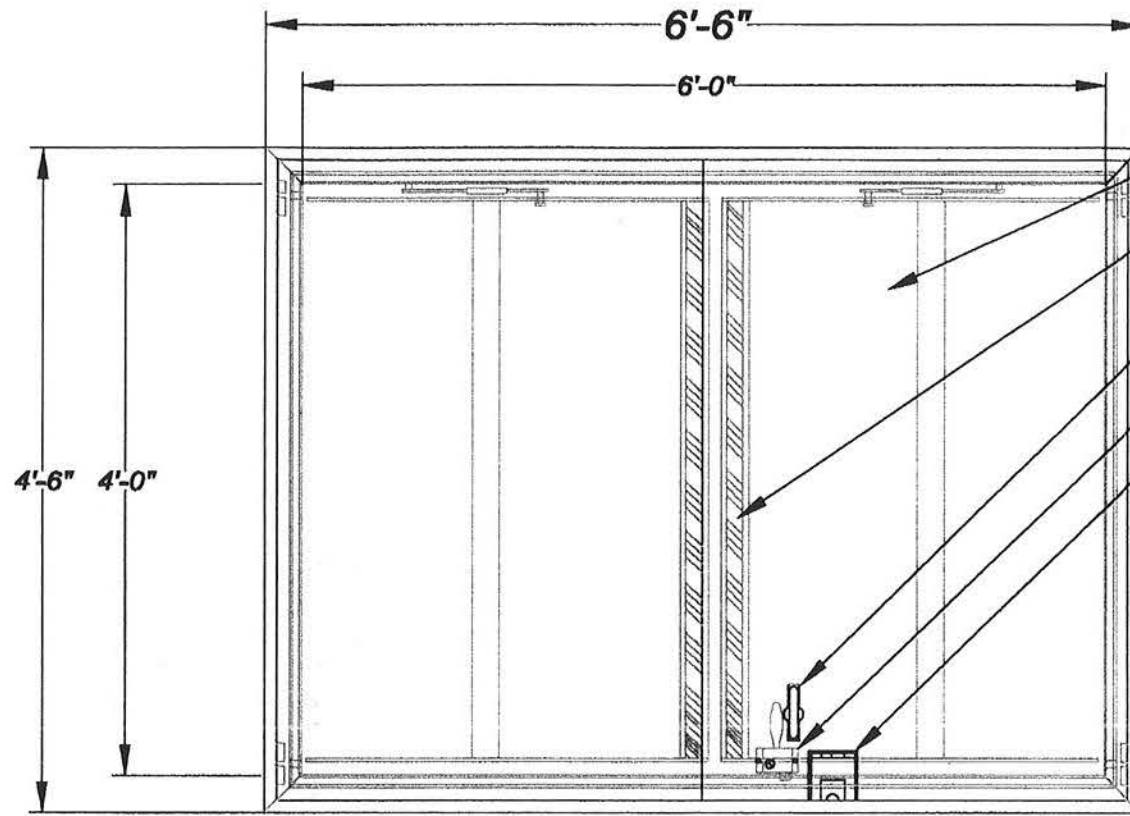
CITY OF CORPUS CHRISTI	6" - 8" BACKFLOW PREVENTER DOUBLE DETECTOR CHECK ASSEMBLY	D. DIETRICH	chvr.	D. DIETRICH	c/d.	Rev. By	Date
WATER UTILITIES ENGINEERING	F. PENA	D. DIETRICH	Designed	Date	04/24/01	Rev. By	Date
						Sh. of	P.N.
						06/26/01	

ATTACHMENT "F"

Fire-Line/Water Service Package

Page 6 of 13

Last Revision: Dec 2004



SPLATTER - PROTECTIVE  
REMOVABLE COVER

VISIBILITY SAFETY TAPE  
( APPLIED TO UNDERSIDE  
OF LID )

STAINLESS STEEL RECESS HANDLE

S.S. SLAM LATCH

RECESSED HASP BOX

### SPECIFICATIONS

**NOTE :**

Aluminum doors are for offstreet locations and pedestrian loading only.

Access door assembly shall be non watertight. Door lids shall be fabricated with 3/16" mill finish aluminum plate designed to support a 300 lb./s.f. live load with a maximum deflection of 1/150th of span. Doors shall open 90 degrees and automatically lock in that position with a stainless steel hold open arm with a red vinyl grip. Doors shall be equipped with a recessed lift handle, stainless steel slam lock with cover plug and two ( 2 ) removable " T " handles, and stainless steel spring assist which shall provide a smooth and controlled operation when opening and closing. Operation will not be affected by temperature. The underside of each door shall have visibility tape applied for safety. Doors shall be interlocking i.e., the lockable door, when locked, shall keep the other door from being opened. Lock shall be recessed hasp. Frame shall be a 4" deep extruded aluminum with a 1/8" neoprene cushion, continous anchor flange and UniFrame Nut Rail to accomadate 1/2" nuts. Frame shall have sufficient bitumastic coating applied to the exterior to prevent hydrolysis with concrete.

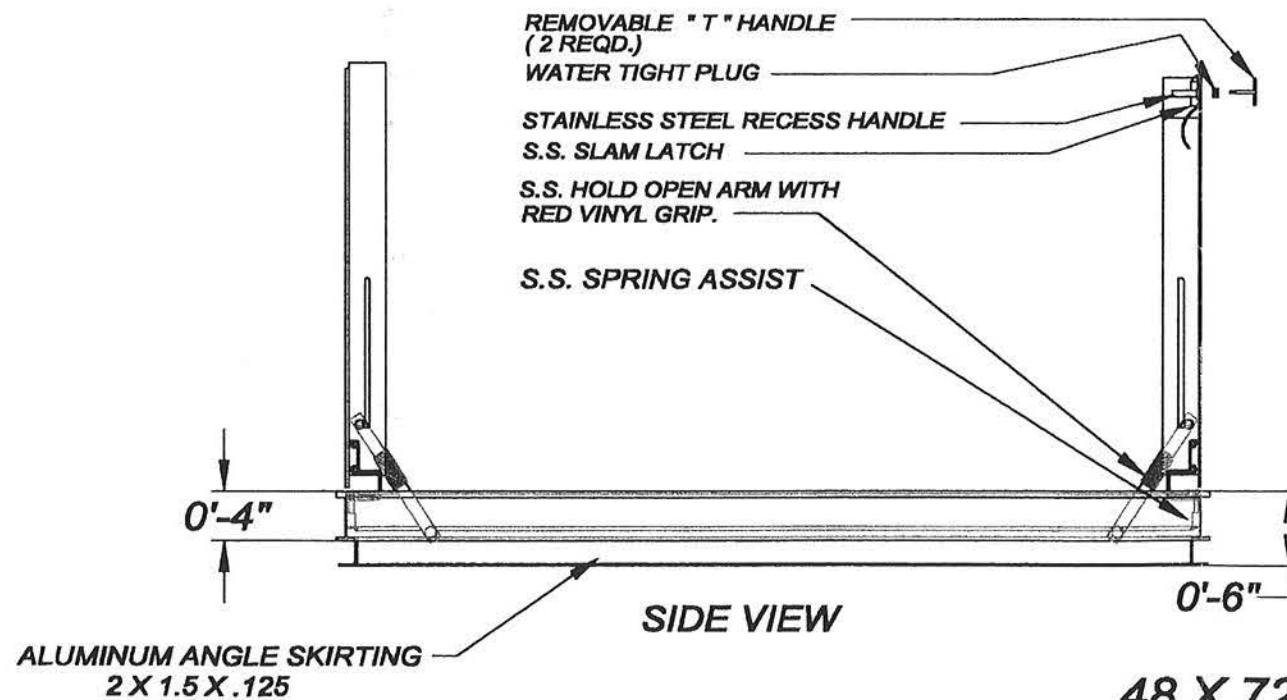
Skirting will be Aluminum angle 2 x 1 1/2 x .125 to make the total thickness of the frame assembly 6".

Door and Frame Assembly shall be furnished with peel-off protective cover to protect from concrete splatter.

All hardware shall be grade 316 stainless steel.

This is an example of a product manufactured by ACCESS MANUFACTURING, MASPETH, NY.

TOP VIEW



SIDE VIEW

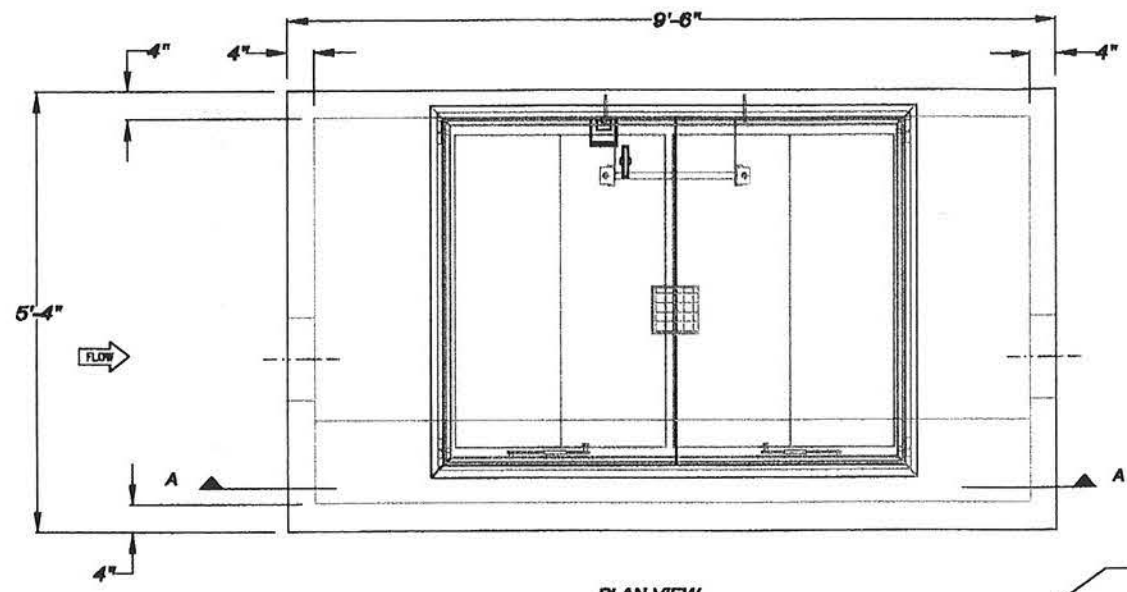
## 48 X 72 ACCESS DOOR - DOUBLE LEAF

ATTACHMENT "F"  
Fire-Line/Water Service Package  
Page 7 of 13  
Last Revision: Dec 2004

NOTE: GREY LINES ARE HIDDEN LINES.

CITY OF CORPUS CHRISTI		WATER UTILITIES ENGINEERING		Sh. of	P.N.
48 X 72		ACCESS DOOR - DOUBLE LEAF		Rev. By	Date
D.W.M. D. DIETRICH		c/d.		Approved	Date
D. DIETRICH		Designed		F. PENA	
04/24/01		Date		08/26/01	
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**VAULT SPECIFICATIONS :**

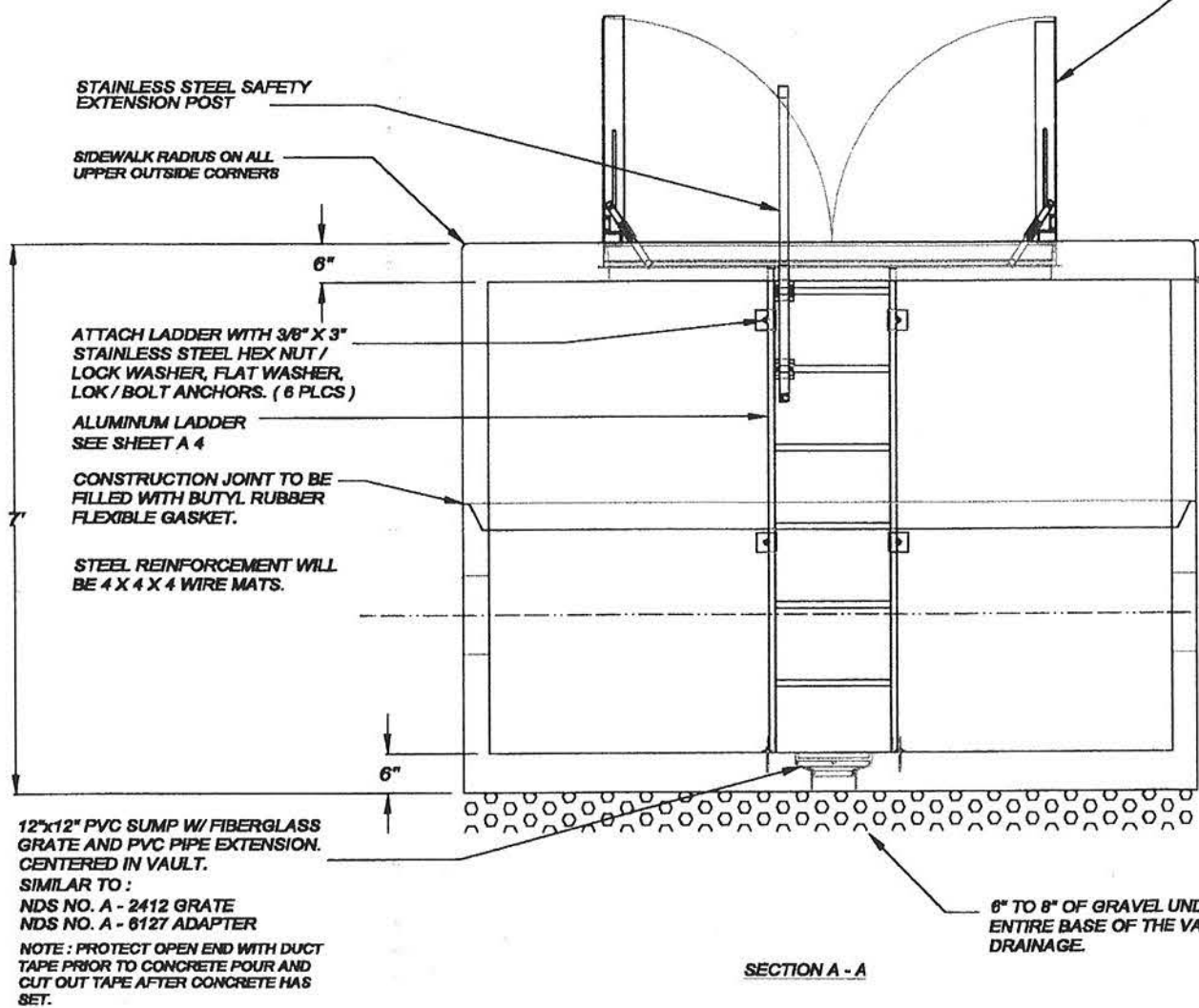
**SIDE WALLS:** 4" - 4 X 4 X #4 WIRE ( ALL WIRE GRADE 60 )

**TOP :** 6" - 4 X 4 X #4 WIRE WITH 4'-0" X 6'-0" DOUBLE LEAF ALUMINUM HATCHWAY SEE DRAWING B 4

**BOTTOM :** 6" - 4 X 4 X #4 WIRE

**CONCRETE :** 4000 psi - 600 lbs per cy ( 50% 5/8" pea gravel, 50% sand )

**REINFORCEMENT:** ADD ADDITIONAL REINFORCEMENT AROUND HATCHWAY AND OPENINGS TO PREVENT CRACKING.



**NOTE:**

1.) VAULT MAY BE INSTALLED FLUSH WITH PEDESTRIAN WALKWAYS. STANDARD EXPANSION JOINT MATERIAL WILL BE UTILIZED BETWEEN THE VAULT AND ADJACENT CONCRETE.

2.) VEHICULAR TRAFFIC ON VAULT WILL REQUIRE SPECIAL HATCHWAY AND SEPERATE SUBMITTAL DRAWINGS APPROVED BY A REGISTERED PROFESSIONAL ENGINEER.

ACCESS DOOR SKIRTING WILL BE FLUSH WITH INSIDE FACE.

4'-0" X 6'-0" DOUBLE LEAF ALUMINUM HATCHWAY. SEE SHEET A 2

4" TO 6" ABOVE FINISHED GRADE (SEE NOTE 1 ABOVE)

FINISHED GRADE

2'-3"

2'-1"

END VIEW

12" DIA. OPENING EACH END

Engineering Data

Field excavation and preparation shall be completed prior to delivery of vault assembly. Use dimensional data as shown. Pipe, valves and fittings of the assembly will be approved by one or more of the following associations:



**ATTACHMENT "F"**  
 Fire-Line/Water Service Package  
 Page 9 of 13  
 Last Revision: Dec 2004

NOTE: GREY LINES ARE HIDDEN LINES.

US FILTER HATCHWAY, SAFETY EXTENSION POST, ALUMINUM LADDER AND FLOOR DRAIN PACKAGE PART NUMBER CCAAC4872

# VAULT ASSEMBLY FIRELINE DOUBLE CHECK DETECTOR

CITY OF CORPUS CHRISTI WATER UTILITIES ENGINEERING

Sh. of	F.PENA	Approved	Date 06/26/01
P.N.			
Designed	D. DIETRICH	Designed	Date 04/24/01
Drawn	D. DIETRICH	Drawn	Date
Checked		Checked	Date
Scale		Scale	
Description	VAULT ASSEMBLY FIRELINE DOUBLE CHECK DETECTOR		
Rev. By		Rev. By	
Date		Date	
Page	D.N. A 4		

ONE PIECE  
STAINLESS STEEL  
TAPPING SLEEVE  
Line Size x 6" MIN.

CITY WATER MAIN

M.J. X FLANGE  
TAPPING VALVE

6" OR 8" DUCTILE  
IRON

MECHANICAL JOINT  
TEE 6" OR 8" X 4"

6" OR 8"  
MECHANICAL JOINT  
CAP

6' MINIMUM  
(AND NO CLOSER  
THAN 3' FROM THE  
EDGE OF THE VAULT.)

1'-6" MINIMUM

EXCAVATION OUTLINE

FRONT VIEW

12" TO 14"

NOTES:

1. MINIMUM TAP SIZE IS SIX ( 6 ) INCHES
2. ALL MECHANICAL JOINTS WILL BE RESTRAINED
3. SEE EXHIBIT B 2 FOR EXCAVATION REQUIREMENTS
4. WHEN A 3" OR 4" METER IS REQUIRED, A METER VAULT WILL BE INSTALLED. ( SEE SHEET B 3 )

EXCAVATION OUTLINE  
( SEE SHEET B 2 )

4 " DUCTILE IRON METER RUN

4 " 90° MECHANICAL JOINT ELL

4 " MECHANICAL JOINT CAP

3' MAXIMUM

PROPERTY LINE

FOR METER VAULT,  
SEE NOTE 4., ABOVE.

INSTALL STANDARD CITY  
VALVE BOX , LID AND 8" PVC  
RISER. ENCASE WITH 3000  
PSI CONCRETE RING (20"  
DIA. X 9" DEEP).

PROPERTY LINE

3' MAXIMUM

FINISHED GRADE

SIDE VIEW

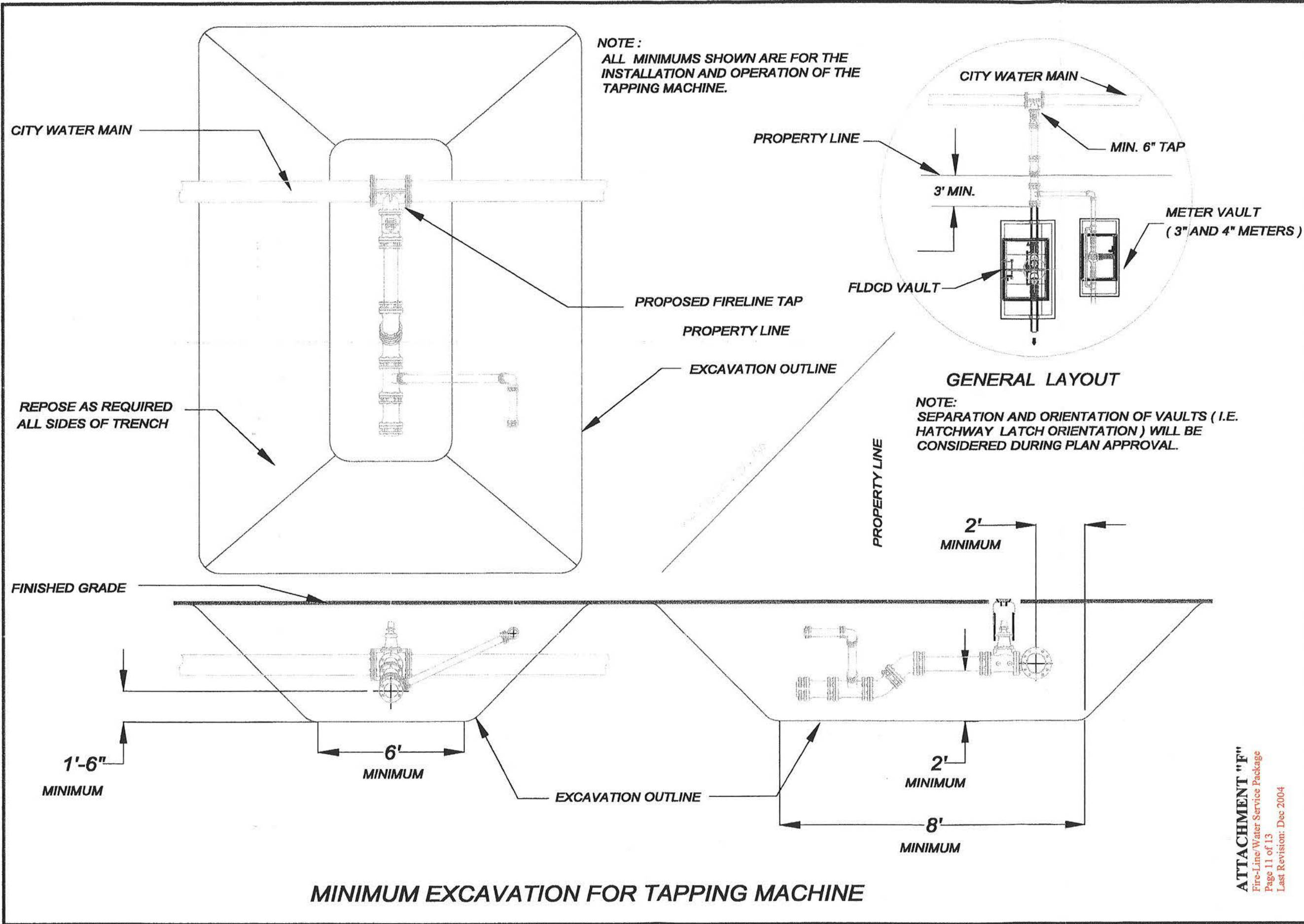
OFFSET AS REQUIRED  
ALL MECHANICAL JOINT  
( RESTRAINED )

FIRELINE TAP REQUIREMENTS

ATTACHMENT "F"  
Fire-Line/Water Service Package  
Page 10 of 13  
Last Revision: Dec 2004

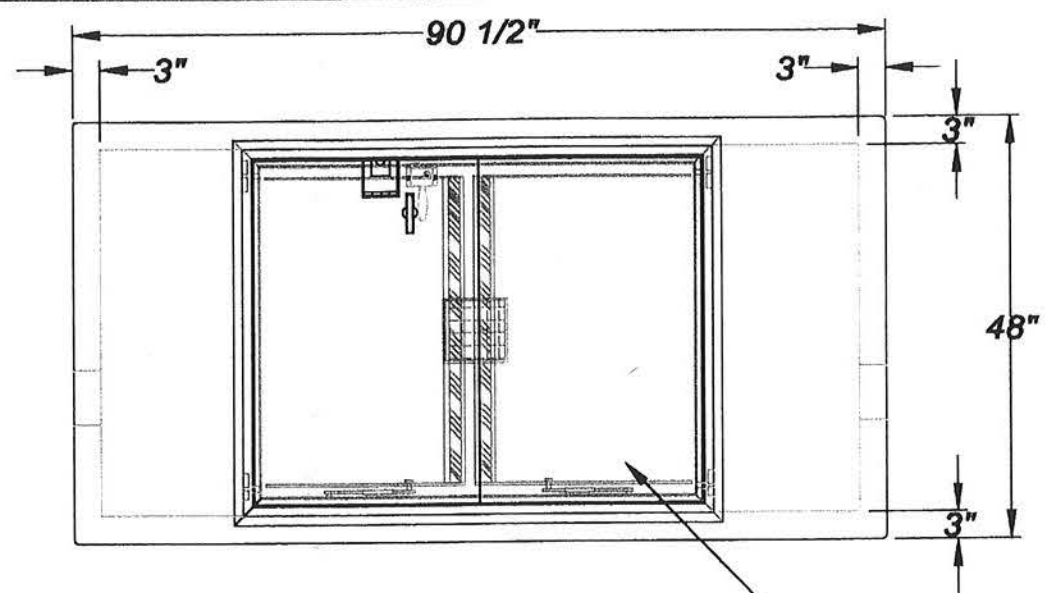
CITY OF CORPUS CHRISTI WATER UTILITIES ENGINEERING

Sh. of	F.PENA	Approved	Date	P.N.
			08/26/01	
Designed	D.DIETRICH	Approved	Date	
			04/24/01	
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**ATTACHMENT "F"**  
Fire-Line/Water Service Package  
Page 11 of 13  
Last Revision: Dec 2004

CITY OF CORPUS CHRISTI		WATER UTILITIES ENGINEERING	
Page	Rev. By	Date	Description
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<b>B</b>			
	dwg. D.DIETRICH	ckd.	
	hor. N.T.B.	Scale: vert.	
Designed	D.DIETRICH	Date	04/24/01
Approved	F.PENA	Date	06/26/01
Sh. of		P.N.	



**VAULT TOP VIEW**

36" X 48" DOUBLE LEAF ALUMINUM HATCHWAY CENTERED IN VAULT TOP. SEE SHEET B 4

**VAULT SPECIFICATIONS :**

**TOP:** 4" - 4 X 4 X #4 WIRE WITH 3'-0" X 4'-0" DOUBLE LEAF ALUMINUM HATCHWAY SEE DRAWING B 4

**SIDE WALLS:** 3" - 4 X 4 X #4 WIRE

**BOTTOM :** 5" - 4 X 4 X #4 WIRE

**CONCRETE :** 4000 psi - 600 lbs per cy ( 50% 5/8" pea gravel. 50% sand )

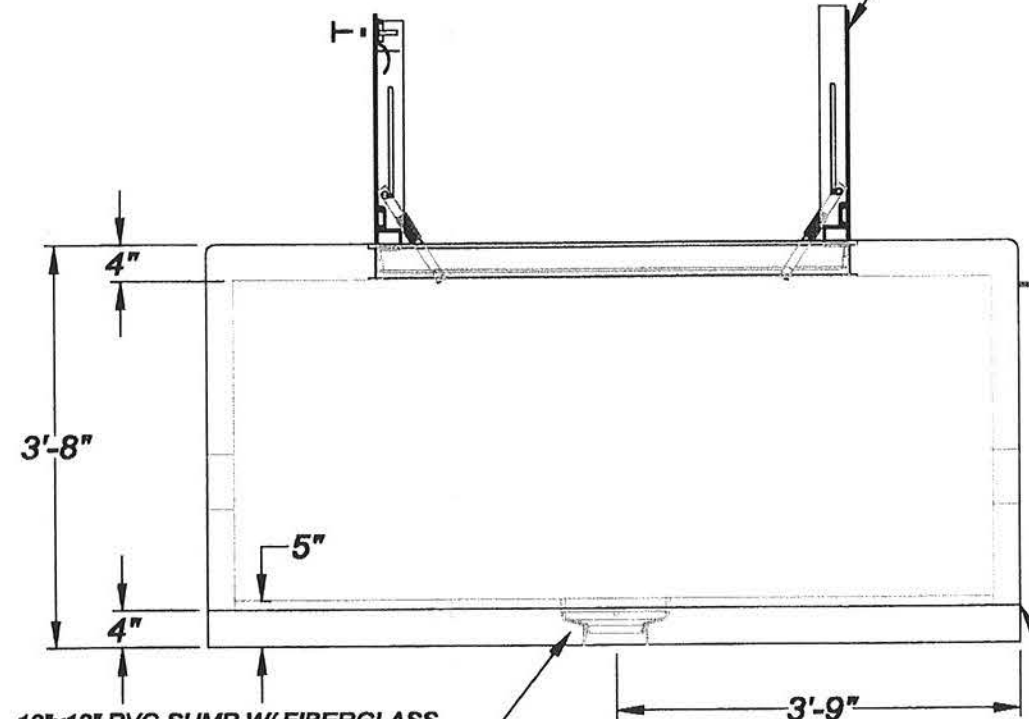
**REINFORCEMENT :** ADD ADDITIONAL REINFORCEMENT AROUND HATCHWAY AND OPENINGS TO PREVENT CRACKING.

**NOTE:**

1.) VAULT MAY BE INSTALLED FLUSH WITH PEDESTRIAN WALKWAYS. STANDARD EXPANSION JOINT MATERIAL WILL BE UTILIZED BETWEEN THE VAULT AND ADJACENT CONCRETE.

2.) VEHICULAR TRAFFIC ON VAULT WILL REQUIRE SPECIAL HATCHWAY AND SEPERATE SUBMITTAL DRAWINGS APPROVED BY A REGISTERED PROFESSIONAL ENGINEER.

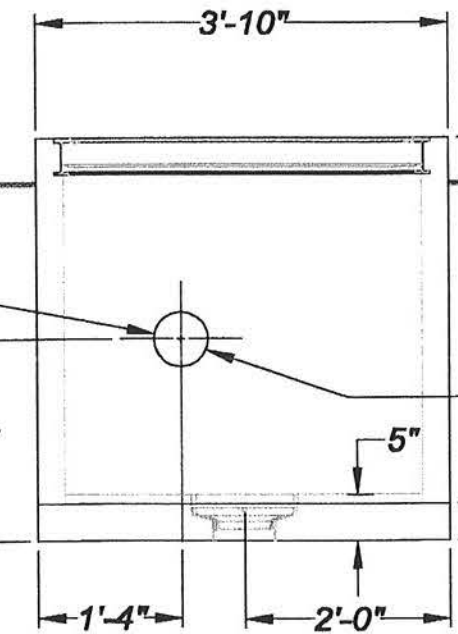
3.) SEPARATION AND ORIENTATION OF VAULTS ( I.E. HATCHWAY LATCH ORIENTATION ) WILL BE CONSIDERED DURING PLAN APPROVAL.



**VAULT SIDE VIEW**

12"x12" PVC SUMP W/ FIBERGLASS GRATE AND PVC PIPE EXTENSION. CENTERED IN VAULT. SIMILAR TO : NDS NO. A - 2412 GRATE NDS NO. A - 6127 ADAPTER NOTE : PROTECT OPEN END WITH DUCT TAPE PRIOR TO CONCRETE POUR AND CUT OUT TAPE AFTER CONCRETE HAS SET.

FINISHED GRADE



**VAULT END VIEW**

CONSTRUCTION JOINT TO BE FILLED 100% WITH BUTYL RUBBER FLEXIBLE GASKET.

AFTER METER INSTALLATION INSTALL EXPANSION JOINT FILLER AROUND PIPE AND GROUT.

**48 X 90 METER VAULT ASSEMBLY**

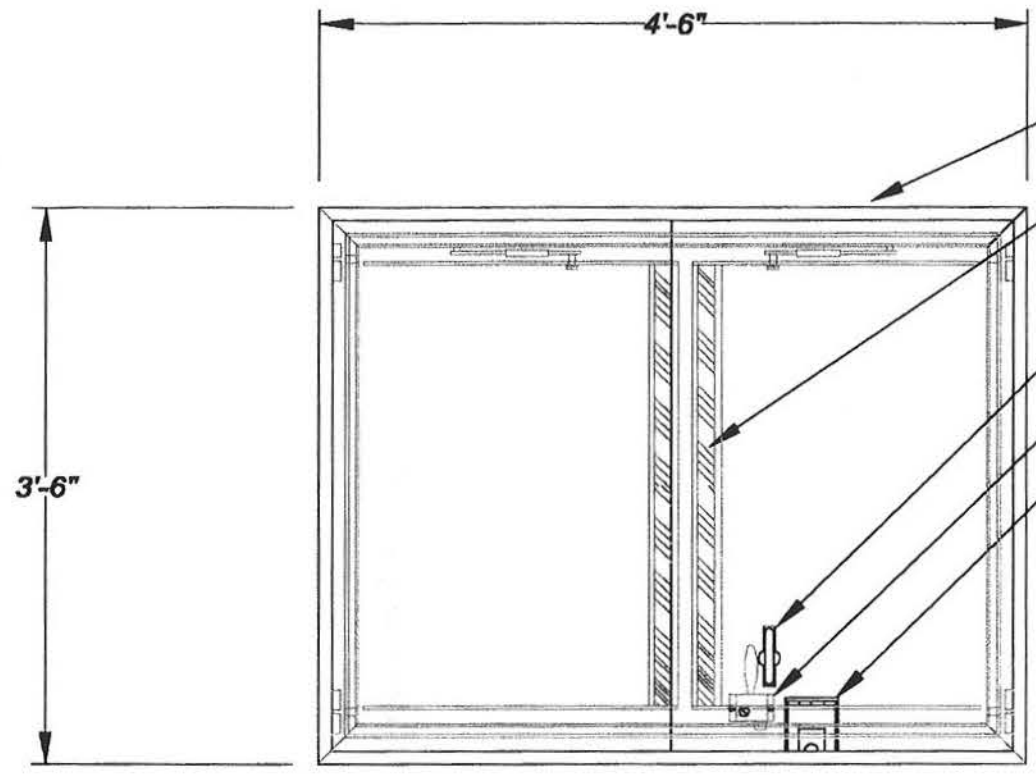
US FILTER HATCHWAY AND FLOOR DRAIN PACKAGE PART NUMBER CCAAC3648

NOTE: GREY LINES ARE HIDDEN LINES.

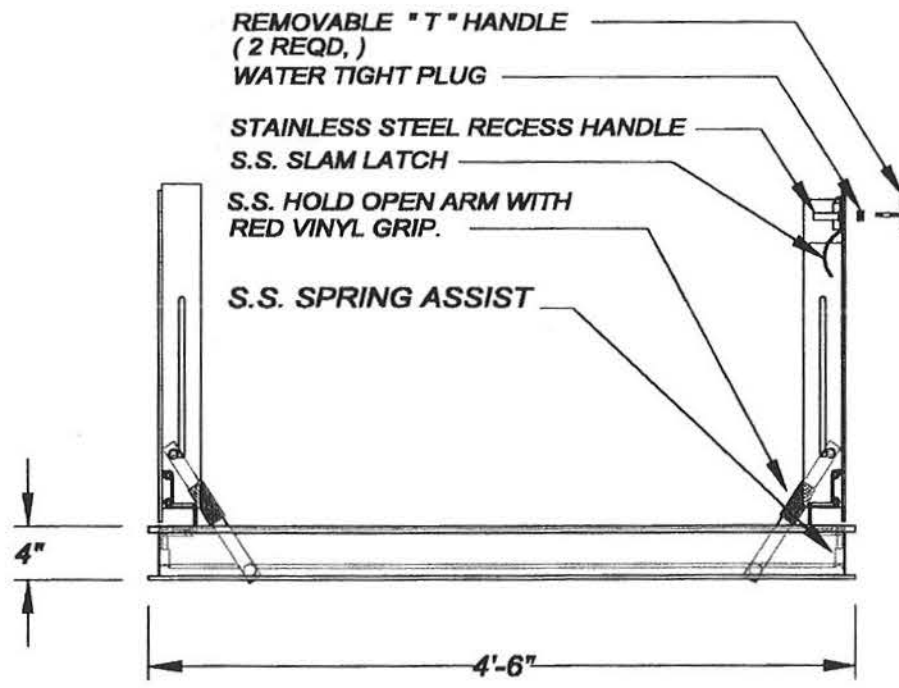
ATTACHMENT "F"  
Fire-Line/Water Service Package  
Page 12 of 13  
Last Revision: Dec 2004

CITY OF CORPUS CHRISTI		WATER UTILITIES ENGINEERING	
Rev. By	Date	Description	
METER VAULT 48 X 90		chn. D. DIETRICH	ctcd.
D. DIETRICH		Designed	Date 04/24/01
F. PENA		Approved	Date 08/26/01
Sh. of	P. N.		
Page		D.N.	
3		3	





TOP VIEW



SIDE VIEW

- SPLATTER - PROTECTIVE REMOVABLE COVER
- VISIBILITY SAFETY TAPE ( APPLIED TO UNDERSIDE OF LID )
- STAINLESS STEEL RECESS HANDLE
- S.S. SLAM LATCH
- RECESSED HASP BOX

**SPECIFICATIONS**

**NOTE :**  
 Aluminum doors are for offstreet locations and pedestrian loading only.

Access door assembly shall be non watertight. Door lids shall be fabricated with 3/16" mill finish aluminum plate designed to support a 300 lb./s.f. live load with a maximum deflection of 1/150th of span. Doors shall open 90 degrees and automatically lock in that position with a stainless steel hold open arm with a red vinyl grip. Doors shall be equipped with a recessed lift handle, stainless steel slam lock with cover plug and two ( 2 ) removable " T " handles, and stainless steel spring assist which shall provide a smooth and controlled operation when opening and closing. Operation will not be affected by temperature. The underside of each door shall have visibility tape applied for safety. Doors shall be interlocking i.e., the lockable door, when locked, shall keep the other door from being opened. Lock shall be recessed hasp. Frame shall be a 4" deep extruded aluminum with a 1/8" neoprene cushion, continous anchor flange and UniFrame Nut Rail to accomadate 1/2" nuts. Frame shall have sufficient bitumastic coating applied to the exterior to prevent hydrolysis with concrete.

Door and Frame Assembly shall be furnished with peel-off protective cover to protect from concrete splatter. All hardware shall be grade 316 stainless steel. This is an example of a product manufactured by ACCESS MANUFACTURING, MASPETH, NY.

**36 X 48  
 ACCESS DOOR - DOUBLE LEAF**

ATTACHMENT "F"  
 Fire-Line/Water Service Package  
 Page 13 of 13  
 Last Revision: Dec 2004

NOTE: GREY LINES ARE HIDDEN LINES.

CITY OF CORPUS CHRISTI		WATER UTILITIES ENGINEERING	
36 X 48	ACCESS DOOR - DOUBLE LEAF	DRW. D. DIETRICH	CHKD.
Rev. By	Date	Description	Page
D.N.	B	4	
D. DIETRICH	Designed	Date 04/24/01	
F. PENA	Approved	Date 06/26/01	
Sh. of	P.N.		

**BID TABULATION**  
**SAMPLES**

TABULATED BY: 'Angel R. Escobar, P. E., Director of Engineering Services

ENGINEER'S ESTIMATE: \$79,000.00

DATE: Wednesday, November 8, 2000

Page 1 of 3

TIME OF COMPLETION: 45 Calendar Days

O. N. Stevens Water Treatment Plant Sludge Lagoons and Presedimentation Basin Rehabilitatn: Pollywog Pond Improvements Project No. 8365				JSJ Services, Inc. 8601 Up River Road Corpus Christi, TX 78409		Four-Star Design & Const. 730 Quetzal Street Corpus Christi, TX 78418		Isensee Construction 746 Princess Corpus Christi, TX 78410	
	DESCRIPTION	QTY.	UNIT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT
1.	Timber Boardwalk, including timber lumber (0.6 CCA), concrete, etc., complete in place per LS.	1	LS		19,140.00		34,500.00		34,500.00
2.	Information Kiosk, including premanufactured structure, concrete slab, etc., complete in place per LS.	1	LS		5,800.00		7,750.00		13,750.00
3.	Birdwatching Observation Blind, including lumber (0.6 CCA), etc., complete in place per LS.	1	LS		2,400.00		2,500.00		2,750.00
	<b><u>TOTAL BASE BID</u></b>				27,340.00		44,750.00		51,000.00
1.	Resurface berms with sand cap, complete in place per CY.	200	CY		800.00		4,900.00		8,000.00
	<b><u>TOTAL BASE BID PLUS ADDITIVE ALTERNATE NO. 1</u></b>				28,140.00		49,650.00		59,000.00

DEPARTMENT OF ENGINEERING SERVICES - CITY OF CORPUS CHRISTI, TEXAS

TABULATED BY: 'Angel R. Escobar, P. E., Director of Engineering Services

ENGINEER'S ESTIMATE: \$79,000.00

DATE: Wednesday, November 8, 2000

Page 2 of 3

TIME OF COMPLETION: 45 Calendar Days

O. N. Stevens Water Treatment Plant Sludge Lagoons and Presedimentation Basin Rehabilitatn: Pollywog Pond Improvements Project No. 8365				Bracco Construction 4722 Neptune St. Corpus Christi, TX 78405		Reese Contracting, Inc. P. O. Box 8352 Corpus Christi, TX 78468		R. S. Black Civil Engr. P. O. Box 6385 Corpus Christi, TX 78466	
	DESCRIPTION	QTY.	UNIT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT
1.	Timber Boardwalk, including timber lumber (0.6 CCA), concrete, etc., complete in place per LS.	1	LS		49,760.00		61,000.00		71,900.00
2.	Information Kiosk, including premanufactured structure, concrete slab, etc., complete in place per LS.	1	LS		10,500.00		6,000.00		8,000.00
3.	Birdwatching Observation Blind, including lumber (0.6 CCA), etc., complete in place per LS.	1	LS		3,851.00		4,000.00		3,000.00
	<b><u>TOTAL BASE BID</u></b>				64,111.00		71,000.00		82,900.00
1.	Resurface berms with sand cap, complete in place per CY.	200	CY		5,600.00		6,000.00		6,250.00
	<b><u>TOTAL BASE BID PLUS ADDITIVE ALTERNATE NO. 1</u></b>				69,711.00		77,000.00		89,150.00

DEPARTMENT OF ENGINEERING SERVICES - CITY OF CORPUS CHRISTI, TEXAS

TABULATED BY: 'Angel R. Escobar, P. E., Director of Engineering Services  
 DATE: Wednesday, November 8, 2000

ENGINEER'S ESTIMATE: \$79,000.00

Page 3 of 3

TIME OF COMPLETION: 45 Calendar Days

O. N. Stevens Water Treatment Plant Sludge Lagoons and Presedimentation Basin Rehabilitatn: Pollywog Pond Improvements Project No. 8365				JSJ Services, Inc. 8601 Up River Road Corpus Christi, TX 78409 <b>NOTE NO. 1</b>					
	DESCRIPTION	QTY.	UNIT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT
1.	Timber Boardwalk, including timber lumber (0.6 CCA), concrete, etc., complete in place per LS.	1	LS		19,140.00				
2.	Information Kiosk, including premanufactured structure, concrete slab, etc., complete in place per LS.	1	LS		5,800.00				
3.	Birdwatching Observation Blind, including lumber (0.6 CCA), etc., complete in place per LS.	1	LS		2,400.00				
	<b><u>TOTAL BASE BID</u></b>				27,340.00				
1.	Resurface berms with sand cap, complete in place per CY.	200	CY		800.00				
	<b><u>TOTAL BASE BID PLUS ADDITIVE ALTERNATE NO. 1</u></b>				28,140.00				

NOTE NO. 1 - initial bid submitted by JSJ Services, Inc. did not include Bid Bond and is considered Nonresponsive.

## TABULATION OF BIDS

TABULATED BY: Doug Ellis, P.E., Project Manager, DMJM Aviation, Inc.  
 BID DATE: Wednesday, August 30, 2000

ENGINEER'S ESTIMATE: \$2,454,000  
 PROJECT DURATION: 730 Calendar Days

TERMINAL APRON IMPROVEMENTS CORPUS CHRISTI INTERNATIONAL AIRPORT PROJECT NO. 1072				W. B. CONSTRUCTION, LTD. 7055 FANNETT ROAD BEAUMONT, TX 77705		BAY, LTD. 1414 CORN PRODUCTS RD. CORPUS CHRISTI, TX 78469		HAAS-ANDERSON CONST., INC. P. O. BOX 7692 CORPUS CHRISTI, TX 78467	
BID ITEM	DESCRIPTION	QTY	UNIT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT
	<b>Apron Bid Items (Base Bid)</b>								
1	P-101-2.1 Mobilization, complete in place per Lump Sum.	1	LS	136,000.00	136,000.00	131,341.00	131,341.00	200,000.00	200,000.00
2	P-152-4.1 Unclassified Excavation, complete in place per Cubic Yard.	17,500	CY	9.12	159,600.00	5.30	92,750.00	6.40	112,000.00
3	P-153-4.1 Removal of Airfield Pavement (Concrete), complete in place per Square Yard.	6,700	SY	10.00	67,000.00	10.40	69,680.00	17.60	117,920.00
4	P-153-4.3 Milling of Bituminous Surface Course, complete in place per Square Yard.	850	SY	4.95	4,207.50	11.50	9,775.00	15.40	13,090.00
5	P-153-4.4 Removal of Miscellaneous Bituminous and Concrete Pavement for Roadways, Driveways, Sidewalks, Parking Areas, Complete, complete in place per Square Yard.	5,200	SY	7.01	36,452.00	2.70	14,040.00	7.20	37,440.00
6	P-153-4.5 Removal of Airfield Guidance Sign including Foundation, complete in place per Each.	2	Each	1,265.00	2,530.00	260.00	520.00	1,000.00	2,000.00
7	P-153-4.6 Removal of Airfield Edge Light including Base, complete in place per Each.	24	Each	350.00	8,400.00	100.00	2,400.00	200.00	4,800.00
8	P-153-4.7 Removal of 2-inch PVC Conduit, Concrete Encased, including Conductor, complete in place per Linear Foot.	1,800	LF	7.75	13,950.00	5.60	10,080.00	3.50	6,300.00
9	P-153-4.8 Remove Concrete Drainage Headwall, complete, per Each.	1	Each	1,850.00	1,850.00	1,000.00	1,000.00	1,700.00	1,700.00

10	P-155-8.1 8-inch Lime Stabilized Subgrade, complete in place, per Square Yard.	30,050	SY	1.96	* 58,898.00	2.40	72,120.00	3.00	
11	P-155-8.2 Lime, complete in place per Ton.	670	TON	129.07	86,476.90	90.00	60,300.00	78.00	52,260.00
12	P-156-5.1 Siltation Fence, complete in place per Linear Foot.	1,720	LF	3.53	6,071.60	4.90	8,428.00	4.30	7,396.00
13	P-209-5.1 Crushed Aggregate Base Course, 6-inch depth, complete in place per Square Yard.	17,250	SY	7.01	120,922.50	6.95	119,887.50	8.80	151,800.00
14	P-209-5.2 Crushed Aggregate Base Course, 8-inch depth, complete in place per Square Yard.	6,750	SY	8.42	56,835.00	9.40	63,450.00	12.00	81,000.00
15	P-209-5.3 Crushed Aggregate Base Course, 10-inch depth, complete in place per Square Yard.	6,450	SY	8.77	56,566.50	13.00	83,850.00	16.50	106,425.00
16	P-401-8.1 Bituminous Surface Course, complete in place per Ton.	3,000	TON	42.09	126,270.00	50.00	150,000.00	43.30	129,900.00
17	P-401-8.2 Bituminous Base Course, complete in place per Ton.	5,280	TON	39.28	207,398.40	50.00	264,000.00	37.20	196,416.00
18	P-501-8.1 15-inch Portland Cement Concrete Pavement, complete in place per Square Yard.	13,660	SY	59.25	809,355.00	69.00	942,540.00	59.50	812,770.00
19	P-501-8.2 9-inch Port Cement Concrete Pavement, complete in place per Square Yard.	3,570	SY	45.30	161,721.00	59.00	210,630.00	49.00	174,930.00
20	P-602-5.1 Bituminous Prime Coat, complete in place per Gallon.	15,430	Gal	1.54	23,762.20	1.90	29,317.00	1.80	27,774.00
21	P-603-5.1 Bituminous Tack Coat, complete in place per Gallon.	4,200	Gal	1.40	5,880.00	2.00	8,400.00	1.85	7,770.00
22	P-620-5.1 Runway and Taxiway Painting, complete in place per Square Foot.	9,000	SF	1.74	15,660.00	1.40	12,600.00	1.50	13,500.00
23	D-620-5.2 Black Outline Marking, complete in place per Square Foot.	3,700	SF	1.74	6,438.00	1.40	5,180.00	1.50	5,550.00

24	D-751-5.1 Adjust Type 'C' Electrical Manhole, complete in place per Each.	2	Each	5,000.00	10,000.00	7,162.00	14,324.00	2,850.00	5,000.00
25	D-751-5.2 Concrete Headwall with parallel wings for 24" RCP, per TxDOT CH-DW-0; complete in place per Each.	1	Each	2,500.00	2,500.00	4,000.00	4,000.00	4,300.00	4,300.00
26	L-104-6.1 Temporary Airfield Circuits, complete in place per Lump Sum.	1	LS	39,425.00	39,425.00	19,000.00	19,000.00	22,800.00	22,800.00
27	L-108-5.1 1/C #8 L-824 5kV Cable, installed in duct or conduit, complete in place per Linear Foot.	3,500	LF	1.85	6,475.00	0.70	2,450.00	0.90	3,150.00
28	L-108-5.2 1/C #6 Bare Copper Counterpoise, installed in trench, complete in place per Linear Foot.	1,750	LF	0.70	* 1,225.00	0.40	700.00	0.50	875.00
29	L-110-5.1 2-inch, Single-way Electrical Duct, Concrete Encased, complete in place per Linear Foot.	1,750	LF	26.25	45,937.50	10.00	17,500.00	12.00	21,000.00
30	L-125-5.1 Installation of existing L-861 Elevated Taxiway Edge Light, including new L-830 Transformer, complete in place per Each.	24	Each	520.50	12,492.00	360.00	8,640.00	430.00	10,320.00
31	L-125-5.2 L-867, Non-Metallic Base Can and appurtances, complete in place per Each.	24	Each	757.50	18,180.00	840.00	20,160.00	1,000.00	24,000.00
32	L-125-5.3 Installation of Existing L-858 Sign, Single and Double Face, 1-Module, complete in place per Each.	2	Each	3,000.00	6,000.00	1,000.00	2,000.00	1,200.00	2,400.00
33	L-125-5.4 Sign Base for L-858 Sign, Single and Double Face, 1-Module, including L-867 Base Can, complete in place per Each.	2	Each	1,500.00	3,000.00	1,600.00	3,200.00	2,350.00	4,700.00
34	L-125-5.5 Furnish New L-861T Omnidirectional, blue, quartz, MITL Taxiway Edge Light, column mounted, complete in place per Each.	6	Each	771.60	4,629.60	300.00	1,800.00	370.00	2,220.00
35	T-901-5.1 Hydro-mulch Seeding, complete in place per Acre.	5	Acre	2,384.95	10,970.77	6,000.00	27,600.00	6,850.00	31,510.00
36	T-905-5.1 Topsoil, complete in place per Cubic Yard.	1,300	CY	16.83	21,879.00	5.00	6,500.00	10.00	13,000.00
37	SS-100.2 Trench Safety System for installation of Waterline and Sewer Line, all depths, complete in place, per Lump Sum.	1	LS	3,582.00	3,582.00	300.00	300.00	3,000.00	3,000.00



38	SS-100.3 Design of Trench Excavation and Shoring Plan, complete in place, per Lump Sum.	1	LS	1,500.00	1,500.00	800.00	800.00	2,000.00	2,000.00
39	SS-100.4 16-inch Diameter Pipe Casing, complete in place, per Linear Foot.	50	LF	80.10	4,005.00	70.00	3,500.00	70.00	3,500.00
40	0-1000 Ozone Day, complete in place, per Each.	5	Each	1,402.91	7,014.55	520.00	2,600.00	400.00	2,000.00
<b>Triturator Station Bid Items (Base Bid)</b>									
41	SS-100.1 Triturator Station, complete with Grinder, Wiring, Piping, Control Panel, Structure, Yard Hydrant, Waterline Sewer Line, Pavement, Masonry Block, Complete in Place per Lump Sum.	1	LS	27,000.00	27,000.00	56,000.00	56,000.00	105,000.00	105,000.00
42	P-155-8.1 8-inch Lime Stabilized Subgrade, complete in place per Square Yard.	129	SY	2.67	344.43	18.00	2,322.00	14.00	1,806.00
43	P-155-8.2 Lime, complete in place per Ton.	3	TON	129.07	387.21	125.00	375.00	115.00	345.00
44	P-209-5.3 Crushed Aggregate Base Course, 10-inch depth, complete in place per Square Yard.	129	SY	9.82	1,266.78	40.00	5,160.00	21.00	2,709.00
45	P-401-8.1 Bituminous Surface Course, complete in place per Ton.	27	TON	49.10	1,325.70	120.00	3,240.00	100.00	2,700.00
46	P-602-5.1 Bituminous Prime Coat, complete in place per Gallon.	64	Gal	1.54	98.56	6.00	384.00	3.00	192.00
<b>East Access Road Bid Items (Base Bid)</b>									
47	P-155-8.1 8-inch Lime Stabilized Subgrade, complete in place per Square Yard.	1,405	SY	1.96	2,753.80	5.00	7,025.00	3.50	4,917.50
48	P-155-8.2 Lime, complete in place per Ton.	25	TON	129.07	3,226.75	90.00	2,250.00	115.00	2,875.00
49	P-209-5.3 Crushed Aggregate Base Course, 10-inch depth, complete in place per Square Yard.	1,310	SY	8.42	11,030.20	14.00	18,340.00	16.00	20,960.00

50	P-401-8.1 Bituminous Surface Course, complete in place per Ton.	255	TON	49.10	12,520.50	50.00	12,750.00	60.00	15,300.00
51	P-602-5.1 Bituminous Prime Coat, complete in place per Gallon.	610	Gal	1.54	939.40	1.40	854.00	2.00	1,220.00
<b>BASE BID TOTAL:</b>					<b>* 2,431,953.35</b>		<b>2,606,062.50</b>		<b>2,667,390.50</b>
AA1	P-153-4.9 Remove Concrete Headwall for a 2- 27" x 43" CMPA, complete per Each.	1	Each	2,600.00	2,600.00	1,000.00	1,000.00	1,500.00	1,500.00
AA2	D-751-5.3 Concrete Headwall with parallel wings for dual (2) 27" x 43" CMPA, complete in place per Each.	1	Each	4,800.00	4,800.00	3,500.00	3,500.00	3,500.00	3,500.00
AA3	D-751-5.4 Dual (2) 27" x 43" Corrugated Metal Arch Pipe (CMPA), complete in place per Linear Foot.	35	LF	110.00	3,850.00	42.00	1,470.00	125.00	4,375.00
AA4	P-155-8.1 8-inch Lime Stabilized Subgrade, complete in place per Square Yard.	2,950	SY	1.96	5,782.00	2.50	7,375.00	3.15	9,292.50
AA5	P-155-8.2 Lime, complete in place per Ton.	55	TON	129.07	7,098.85	90.00	4,950.00	115.00	6,325.00
AA6	P-209-5.3 Crushed Aggregate Base Course, 10-inch depth, complete in place per Square Yard.	2,750	SY	8.42	23,155.00	12.00	33,000.00	16.50	45,375.00
AA7	P-401-8.2 Bituminous Surface Course, complete in place per Ton.	535	Ton	49.10	26,268.50	40.00	21,400.00	52.00	27,820.00
AA8	P-602-5.1 Bituminous Prime Coat, complete in place per Gallon.	1,260	Gal	1.54	1,940.40	1.30	1,638.00	1.75	2,205.00
<b>ADDITIVE ALTERNATE BID TOTAL:</b>					<b>75,494.75</b>		<b>74,333.00</b>		<b>100,392.50</b>
<b>TOTALS:</b>									
<b>BASE BID + ADDITIVE ALTERNATE:</b>					<b>* 2,507,448.10</b>		<b>2,680,395.50</b>		<b>2,767,783.00</b>

\*Error in bid extensions Items #10 & #28 - Totals shown have been corrected.

TABULATION OF BIDS  
DEPARTMENT OF ENGINEERING - CITY OF CORPUS CHRISTI, TEXAS

PREPARED BY: Ángel R. Escobar, P.E., Acting Director of Engineering Services

DATE: Wednesday, April 7, 1999

TIME OF COMPLETION: 40 Working Days

ENGINEER'S ESTIMATE: \$75,000

44th Street Curb and Gutter Replacement Project No. 2048				A. Ortiz Constr/Paving 102 Airport Rd CC, TX 78405		Paladin/E.G. Invest. 10201 Leopard CC, TX 78410		Casey Brothers Constr P.O. Box 4609 CC, TX 78469		King-Isles Inc 1641 Goldston Rd CC, TX 78409	
	DESCRIPTION	QTY.	UNIT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT
A-1	Street excavation	640	SY	6.50	4,160.00	3.50	2,240.00	8.20	5,248.00	14.25	9,120.00
A-2	Remove concrete driveway	2,910	SF	1.90	5,529.00	1.00	2,910.00	2.70	7,857.00	2.75	8,002.50
A-3	Install 6" curb & gutter	690	LF	11.00	7,590.00	8.80	6,072.00	12.00	8,280.00	15.00	10,350.00
A-4	Install concrete driveways	2,530	SF	3.95	9,993.50	3.20	8,096.00	3.45	8,728.50	5.00	12,650.00
A-5	Install Tensar	790	SY	3.15	2,488.50	2.90	2,291.00	4.10	3,239.00	2.50	1,975.00
A-6	Install 6" subgrade	640	SY	4.00	2,560.00	4.25	2,720.00	2.30	1,472.00	5.50	3,520.00
A-7	Install 4" Type B	610	SY	10.75	6,557.50	13.20	8,052.00	11.95	7,289.50	15.50	9,455.00
A-8	Install 5" Type B	330	SY	12.00	3,960.00	16.60	5,478.00	13.90	4,587.00	20.00	6,600.00
A-9	Install 2" Type D	330	SY	8.00	2,640.00	8.00	*2,640.00	6.90	2,277.00	8.50	2,805.00
	<b>TOTAL BASE BID 'A':</b>				<b>\$45,478.50</b>		<b>*\$40,499.00</b>		<b>\$48,978.00</b>		<b>\$64,477.50</b>
AA-1	Street Excavation	280	SY	8.00	2,240.00	4.00	1,120.00	8.20	2,296.00	16.00	4,480.00
AA-2	Concrete driveway removal	1,650	SF	1.98	3,267.00	1.00	1,650.00	2.70	4,455.00	2.50	4,125.00
AA-3	Install 6" curb & gutter	300	LF	13.00	3,900.00	9.00	2,700.00	12.00	3,600.00	13.50	4,050.00
AA-4	Install concrete driveway	1,790	SF	4.25	7,607.50	3.30	5,907.00	3.45	6,175.50	4.50	8,055.00
AA-5	Install Tensar	350	SY	4.75	1,662.50	5.00	1,750.00	4.10	1,435.00	2.50	875.00
AA-6	Install 6" subgrade	380	SY	4.50	1,710.00	4.80	1,824.00	2.30	874.00	5.50	2,090.00
AA-7	Install 4" Type B	270	SY	12.50	3,375.00	16.00	4,320.00	11.95	3,226.50	16.50	4,455.00
AA-8	Install 5" Type B	150	SY	15.00	2,250.00	20.00	3,000.00	13.90	2,085.00	21.00	3,150.00
AA-9	Install 2" Type D	150	SY	9.00	1,350.00	10.00	1,500.00	6.90	1,035.00	8.50	1,275.00
	<b>TOTAL ADD ALT 'AA':</b>				<b>\$27,362.00</b>		<b>\$23,771.00</b>		<b>\$25,182.00</b>		<b>\$32,555.00</b>

TABULATION OF BIDS  
DEPARTMENT OF ENGINEERING - CITY OF CORPUS CHRISTI, TEXAS

Page 2 of 4

PREPARED BY: Ángel R. Escobar, P.E., Acting Director of Engineering Services

DATE: Wednesday, April 7, 1999

TIME OF COMPLETION: 40 Working Days

ENGINEER'S ESTIMATE: \$75,000

44th Street Curb and Gutter Replacement Project No. 2048		A.Ortiz Constr/Paving 102 Airport Rd CC, TX 78405		Paladin/E.G. Invest. 10201 Leopard CC, TX 78410		Casey Brothers Constr P.O. Box 4609 CC, TX 78469		King-Isles Inc 1641 Goldston Rd CC, TX 78409			
DESCRIPTION	QTY.	UNIT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	
<b>TOTAL BASE BID 'A' + ADD ALT 'AA':</b>				<b>\$72,840.50</b>		<b>*\$64,270.00</b>		<b>\$74,160.00</b>		<b>\$97,032.50</b>	
B-1	Street excavation	570	SY	7.00	3,990.00	6.00	3,420.00	8.20	4,674.00	27.50	15,675.00
B-2	Remove concrete driveway	2,910	SF	1.90	5,529.00	1.00	2,910.00	2.70	7,857.00	2.75	8,002.50
B-3	Install 6" curb & gutter	690	LF	11.50	7,935.00	20.00	13,800.00	30.85	21,286.50	32.00	22,080.00
B-4	Install concrete driveway	2,530	SF	3.95	9,993.50	3.20	8,096.00	3.45	8,728.50	5.00	12,650.00
B-5	Install Type B	330	SY	15.50	5,115.00	23.00	7,590.00	17.10	5,643.00	30.00	9,900.00
B-6	Install 2" Type D	330	SY	8.00	2,640.00	8.00	2,640.00	6.90	2,277.00	8.50	2,805.00
<b>TOTAL BASE BID 'B':</b>				<b>\$35,202.50</b>		<b>\$38,456.00</b>		<b>\$50,466.00</b>		<b>\$71,112.50</b>	
B-1	Street excavation	250	SY	8.00	2,000.00	6.00	1,500.00	8.20	2,050.00	30.00	7,500.00
B-2	Concrete driveway removal	1,650	SF	2.00	3,300.00	1.00	1,650.00	2.70	4,455.00	2.50	4,125.00
B-3	Install 6" curb & gutter	300	LF	12.50	3,750.00	20.00	6,000.00	30.85	9,255.00	35.00	10,500.00
B-4	Install concrete driveway	1,790	SF	3.95	7,070.50	3.20	5,728.00	3.45	6,175.50	4.50	8,055.00
B-5	Install Type B (various thickness)	150	SY	15.50	2,325.00	25.00	3,750.00	17.10	2,565.00	32.00	4,800.00
B-6	Install 2" Type D	150	SY	7.00	1,050.00	10.00	1,500.00	6.90	1,035.00	9.00	1,350.00
<b>TOTAL ADD ALT 'BB':</b>				<b>\$19,495.50</b>		<b>\$20,128.00</b>		<b>\$25,535.50</b>		<b>\$36,330.00</b>	
<b>TOTAL BASE BID 'B' + ADD ALT 'BB':</b>				<b>\$54,698.00</b>		<b>\$58,584.00</b>		<b>\$76,001.50</b>		<b>\$107,442.50</b>	

\*Error in extension - totals shown have been corrected

**TABULATION OF BIDS**  
**DEPARTMENT OF ENGINEERING - CITY OF CORPUS CHRISTI, TEXAS**

**PREPARED BY:** Angel R. Escobar, P.E., Acting Director of Engineering Services

**DATE:** Wednesday, April 7, 1999

**TIME OF COMPLETION:** 40 Working Days

**ENGINEER'S ESTIMATE:** \$75,000

44th Street Curb and Gutter Replacement Project No. 2048				Garrett Construction P.O. Box 1028 Ingleside, TX 78362							
	DESCRIPTION	QTY.	UNIT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT
A-1	Street excavation	640	SY	19.80	12,672.00		0.00		0.00		0.00
A-2	Remove concrete driveway	2,910	SF	2.20	6,402.00		0.00		0.00		0.00
A-3	Install 6" curb & gutter	690	LF	9.50	6,555.00		0.00		0.00		0.00
A-4	Install concrete driveways	2,530	SF	3.40	8,602.00		0.00		0.00		0.00
A-5	Install Tensar	790	SY	5.30	4,187.00		0.00		0.00		0.00
A-6	Install 6" subgrade	640	SY	18.10	11,584.00		0.00		0.00		0.00
A-7	Install 4" Type B	610	SY	17.70	10,797.00		0.00		0.00		0.00
A-8	Install 5" Type B	330	SY	27.20	8,976.00		0.00		0.00		0.00
A-9	Install 2" Type D	330	SY	12.00	3,960.00		0.00		0.00		0.00
	<b>TOTAL BASE BID 'A':</b>				<b>\$73,735.00</b>		<b>\$0.00</b>		<b>\$0.00</b>		<b>\$0.00</b>
AA-1	Street Excavation	280	SY	23.90	6,692.00		0.00		0.00		0.00
AA-2	Concrete driveway removal	1,650	SF	2.20	3,630.00		0.00		0.00		0.00
AA-3	Install 6" curb & gutter	300	LF	9.50	2,850.00		0.00		0.00		0.00
AA-4	Install concrete driveway	1,790	SF	3.40	6,086.00		0.00		0.00		0.00
AA-5	Install Tensar	350	SY	6.00	2,100.00		0.00		0.00		0.00
AA-6	Install 6" subgrade	380	SY	22.80	8,664.00		0.00		0.00		0.00
AA-7	Install 4" Type B	270	SY	18.60	5,022.00		0.00		0.00		0.00
AA-8	Install 5" Type B	150	SY	29.90	4,485.00		0.00		0.00		0.00
AA-9	Install 2" Type D	150	SY	13.20	1,980.00		0.00		0.00		0.00
	<b>TOTAL ADD ALT 'AA':</b>				<b>\$41,509.00</b>		<b>\$0.00</b>		<b>\$0.00</b>		<b>\$0.00</b>

TABULATION OF BIDS  
DEPARTMENT OF ENGINEERING - CITY OF CORPUS CHRISTI, TEXAS

BULATED BY: Ángel R. Escobar, P.E., Acting Director of Engineering Services

DATE: Wednesday, April 7, 1999

TIME OF COMPLETION: 40 Working Days

ENGINEER'S ESTIMATE: \$75,000

44th Street Curb and Gutter Replacement Project No. 2048		Garrett Construction P.O. Box 1028 Ingleside, TX 78362									
	DESCRIPTION	QTY.	UNIT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT
	<b>TOTAL BASE BID 'A' + ADD ALT 'AA':</b>				\$115,244.00		\$0.00		\$0.00		\$0.00
B-1	Street excavation	570	SY	37.70	21,489.00		0.00		0.00		0.00
B-2	Remove concrete driveway	2,910	SF	2.20	6,402.00		0.00		0.00		0.00
B-3	Install 6" curb & gutter	690	LF	25.00	17,250.00		0.00		0.00		0.00
B-4	Install concrete driveway	2,530	SF	3.40	8,602.00		0.00		0.00		0.00
B-5	Install Type B	330	SY	42.70	14,091.00		0.00		0.00		0.00
B-6	Install 2" Type D	330	SY	14.60	4,818.00		0.00		0.00		0.00
	<b>TOTAL BASE BID 'B':</b>				\$72,652.00		\$0.00		\$0.00		\$0.00
3B-1	Street excavation	250	SY	43.00	10,750.00		0.00		0.00		0.00
3B-2	Concrete driveway removal	1,650	SF	2.20	3,630.00		0.00		0.00		0.00
3B-3	Install 6" curb & gutter	300	LF	25.00	7,500.00		0.00		0.00		0.00
3B-4	Install concrete driveway	1,790	SF	3.40	6,086.00		0.00		0.00		0.00
3B-5	Install Type B (various thickness)	150	SY	52.30	7,845.00		0.00		0.00		0.00
3B-6	Install 2" Type D	150	SY	35.10	*5,265.00		0.00		0.00		0.00
	<b>TOTAL ADD ALT 'BB':</b>				*\$41,076.00		\$0.00		\$0.00		\$0.00
	<b>TOTAL BASE BID 'B' + ADD ALT 'BB':</b>				*\$113,728.00		\$0.00		\$0.00		\$0.00

\*Error in extension - totals shown have been corrected

TABULATION OF BIDS  
DEPARTMENT OF ENGINEERING - CITY OF CORPUS CHRISTI, TEXAS

SAMPLE C

PREPARED BY: Ángel R. Escobar, P.E., Acting Director of Engineering Services

DATE: Wednesday, March 10, 1999

TIME OF COMPLETION: 180 Calendar Days

ENGINEER'S ESTIMATE: \$833,000

1999 AIRLINE ROAD PHASE II (WOOLDRIDGE ROAD TO SARATOGA BLVD.) UTILITY ADJUSTMENTS PROJECT NO. 6055				W.T. Young Construction Co. P.O. Box 9197 Corpus Christi, TX 78469		King-Isles Inc. 1641 Goldston Rd. Corpus Christi, TX 78409		Bracco Constr. Co. P.O. Box 7067 Corpus Christi, TX 78467	
	DESCRIPTION	QTY.	UNIT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT
A1	12" waterline AWWA C900	3,275	LF	28.00	91,700.00	42.00	137,550.00	22.50	73,687.50
A2	8" waterline AWWA C900	655	LF	23.50	15,392.50	21.50	14,082.50	19.00	12,445.00
A3	6" waterline AWWA C900	440	LF	22.50	9,900.00	16.00	7,040.00	13.38	5,887.20
A4	12 x 12 Tee D.I.	3	EA	500.00	1,500.00	600.00	1,800.00	325.00	975.00
A5	12 x 8 Tee D.I.	4	EA	490.00	1,960.00	525.00	2,100.00	295.00	1,180.00
A6	12 x 6 Tee D.I.	4	EA	460.00	1,840.00	490.00	1,960.00	320.00	1,280.00
A7	8 x 8 Tee D.I.	3	EA	360.00	1,080.00	350.00	1,050.00	280.00	840.00
A8	45" Bend 12" D.I.	8	EA	380.00	3,040.00	510.00	4,080.00	300.00	2,400.00
A9	22½" Bend 12" D.I.	5	EA	350.00	1,750.00	325.00	1,625.00	300.00	1,500.00
A10	11¼" 12" D.I.	2	EA	270.00	540.00	305.00	610.00	295.00	590.00
A11	90" Bend 8" D.I.	8	EA	210.00	1,680.00	300.00	2,400.00	195.00	1,560.00
A12	45° Bend 8" D.I.	14	EA	200.00	2,800.00	230.00	3,220.00	185.00	2,590.00
A13	45° Bend 6" D.I.	6	EA	180.00	1,080.00	190.00	1,140.00	200.00	1,200.00
A14	90" Bend 6" D.I.	8	EA	190.00	1,520.00	200.00	1,600.00	215.00	1,720.00
A15	12 x 8 Reducer D.I.	2	EA	200.00	400.00	190.00	380.00	238.00	476.00
A16	12" plug D.I.	1	EA	200.00	200.00	240.00	240.00	218.00	218.00
A17	8" plug D.I.	5	EA	100.00	500.00	120.00	600.00	210.00	1,050.00
A18	12" gate valve w/box	20	EA	1,250.00	25,000.00	1,350.00	27,000.00	1,030.00	20,600.00
A19	8" gate valve w/box	7	EA	760.00	5,320.00	800.00	5,600.00	650.00	4,550.00
A20	6" gate valve w/box	4	EA	550.00	2,200.00	615.00	2,460.00	511.00	2,044.00

TABULATION OF BIDS  
DEPARTMENT OF ENGINEERING - CITY OF CORPUS CHRISTI, TEXAS

SUBMITTED BY: Ángel R. Escobar, P.E., Acting Director of Engineering Services

DATE: Wednesday, March 10, 1999

TIME OF COMPLETION: 180 Calendar Days

ENGINEER'S ESTIMATE: \$833,000

1999 AIRLINE ROAD PHASE II (WOOLDRIDGE ROAD TO SARATOGA BLVD.) UTILITY ADJUSTMENTS PROJECT NO. 6055				W.T. Young Construction Co. P.O. Box 9197 Corpus Christi, TX 78469.		King-Isles Inc. 1641 Goldston Rd. Corpus Christi, TX 78409		Bracco Constr. Co. P.O. Box 7067 Corpus Christi, TX 78467	
DESCRIPTION	QTY.	UNIT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	
\21 Fire hydrant connection Tee and valve w/box	10	EA	2,270.00	22,700.00	2,550.00	25,500.00	1,511.00	15,110.00	
\22 12" diameter x 1/2" thick steel casing @ Sta. 40+37	85	LF	75.00	6,375.00	160.00	13,600.00	170.00	14,450.00	
\23 12" diameter x 1/2" thick steel casing @ Sta. 46+44	75	LF	75.00	5,625.00	190.00	14,250.00	170.00	12,750.00	
\24 12" diameter x 1/2" thick steel casing @ Sta. 49+30	75	LF	75.00	5,625.00	190.00	14,250.00	170.00	12,750.00	
\25 16" diameter x 3/8" thick steel casing @ Sta. 35+12	70	LF	120.00	8,400.00	200.00	14,000.00	195.00	13,650.00	
\26 16" diameter x 3/8" thick steel casing @ Sta. 56+20	80	LF	100.00	8,000.00	170.00	13,600.00	195.00	15,600.00	
\27 16" diameter x 3/8" thick steel casing @ Sta. 59+35	80	LF	100.00	8,000.00	170.00	13,600.00	195.00	15,600.00	
\28 20" diameter x 3/8" thick steel casing between Sta. 51+51 and Sta. 52+31	80	LF	350.00	28,000.00	400.00	32,000.00	1,000.00	80,000.00	
\29 20" diameter x 3/8" thick steel casing @ Sta. 64+14	80	LF	110.00	8,800.00	100.00	8,000.00	106.00	8,480.00	
\30 12" x 2" tapping saddle	9	EA	300.00	2,700.00	225.00	2,025.00	268.00	2,412.00	
\31 2" dia. service line	9	EA	600.00	5,400.00	280.00	2,520.00	800.00	7,200.00	
\32 Grout existing waterline (6", 8" and 12" dia.)	4,300	LF	8.00	34,400.00	5.50	23,650.00	2.60	11,180.00	
\33 Pavement Repair	97	SY	37.00	3,589.00	50.00	4,850.00	50.00	4,850.00	



TABULATION OF BIDS  
DEPARTMENT OF ENGINEERING - CITY OF CORPUS CHRISTI, TEXAS

PREPARED BY: Ángel R. Escobar, P.E., Acting Director of Engineering Services

DATE: Wednesday, March 10, 1999

TIME OF COMPLETION: 180 Calendar Days

ENGINEER'S ESTIMATE: \$833,000

1999 AIRLINE ROAD PHASE II (WOOLDRIDGE ROAD TO SARATOGA BLVD.) UTILITY ADJUSTMENTS PROJECT NO. 6055				W.T. Young Construction Co. P.O. Box 9197 Corpus Christi, TX 78469		King-Isles Inc. 1641 Goldston Rd. Corpus Christi, TX 78409		Bracco Constr. Co. P.O. Box 7067 Corpus Christi, TX 78467	
	DESCRIPTION	QTY.	UNIT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT
A34	Trench safety for waterlines	4,370	LF	2.00	8,740.00	1.15	5,025.50	2.00	8,740.00
A35	Ozone Advisory	2	EA	1,000.00	2,000.00	1.00	2.00	1,500.00	3,000.00
<b>SUB-TOTAL BASE BID (ITEMS A1-A35):</b>					<b>\$327,756.50</b>		<b>\$403,410.00</b>		<b>\$362,564.70</b>
B1	2-12" diameter PVC Sanitary sewer Force main (under 8' cut)	3,200	LF	50.00	160,000.00	52.00	166,400.00	25.11	80,352.00
B2	12" x 90° D.I.M.J. Bends	4	EA	770.00	3,080.00	775.00	3,100.00	525.00	2,100.00
B3	12" x 45° D.I.M.J. Bends	8	EA	600.00	4,800.00	915.00	7,320.00	490.00	3,920.00
B4	12" x 22½° D.I.M.J. Bends	2	EA	430.00	860.00	485.00	970.00	490.00	980.00
B5	12" x 11¼° D.I.M.J. Bends	4	EA	260.00	1,040.00	485.00	1,940.00	495.00	1,980.00
B6	Air release valve including fiberglass manhole	4	EA	3,200.00	12,800.00	3,900.00	15,600.00	3,640.00	14,560.00
B7	16" diameter x 3/8" thick steel casing @ Sta. 51+04	90	LF	110.00	9,900.00	105.00	9,450.00	106.00	9,540.00
B8	2-20" diameter x 3/8" thick steel casing between Sta. 51+07.4 and Sta. 51+97.4	90	LF	600.00	54,000.00	600.00	54,000.00	760.00	68,400.00
B9	2-20" diameter x 3/8" thick steel casing @ Sta. 37+29	90	LF	250.00	22,500.00	280.00	25,200.00	515.00	46,350.00
B10	2-30" diameter x 1/2" thick steel casing at Sta. 35+66	90	LF	500.00	45,000.00	410.00	36,900.00	867.00	78,030.00
B11	Pavement Repair	150	SY	37.00	5,550.00	50.00	7,500.00	50.00	7,500.00
B12	Cement grout near the telephone manholes	12	CY	210.00	2,520.00	165.00	1,980.00	250.00	3,000.00

TABULATION OF BIDS  
DEPARTMENT OF ENGINEERING - CITY OF CORPUS CHRISTI, TEXAS

PREPARED BY: Ángel R. Escobar, P.E., Acting Director of Engineering Services

DATE: Wednesday, March 10, 1999

TIME OF COMPLETION: 180 Calendar Days

ENGINEER'S ESTIMATE: \$833,000

1999 AIRLINE ROAD PHASE II (WOOLDRIDGE ROAD TO SARATOGA BLVD.) UTILITY ADJUSTMENTS PROJECT NO. 6055				W.T. Young Construction Co. P.O. Box 9197 Corpus Christi, TX 78469		King-Isles Inc. 1641 Goldston Rd. Corpus Christi, TX 78409		Bracco Constr. Co. P.O. Box 7067 Corpus Christi, TX 78467	
	DESCRIPTION	QTY.	UNIT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT
13	60" dia. fiberglass manhole	1	EA	20,000.00	20,000.00	16,500.00	16,500.00	27,000.00	27,000.00
14	Trench safety for force main	1,200	LF	3.00	9,600.00	1.50	4,800.00	2.00	6,400.00
15	Ozone Advisory	2	EA	1,000.00	2,000.00	1.00	2.00	1,500.00	3,000.00
<b>SUB-TOTAL BASE BID (ITEMS B1-B15):</b>					<b>\$353,650.00</b>		<b>\$351,662.00</b>		<b>\$353,112.00</b>
<b>SUB-TOTAL BASE BID A + B:</b>					<b>\$681,406.50</b>		<b>\$755,072.00</b>		<b>\$715,676.70</b>
11	Installation ONLY of 6" wrapped steel gas line	3,000	LF	58.00	174,000.00	60.00	180,000.00	82.00	246,000.00
12	Installation ONLY of 6"x6" welded Tee	2	EA	340.00	680.00	350.00	700.00	200.00	400.00
13	Installation ONLY of 45" welded Bend 6"	12	EA	225.00	2,700.00	230.00	2,760.00	150.00	1,800.00
14	Installation ONLY of 11-1/4" welded Bend 6"	2	EA	225.00	450.00	230.00	460.00	150.00	300.00
15	Installation ONLY of 6" welded cap	4	EA	120.00	480.00	115.00	460.00	120.00	480.00
16	Installation ONLY of 6" diameter welded lubricated plug valve	4	EA	450.00	1,800.00	460.00	1,840.00	120.00	480.00
17	Pavement repair	67	SY	37.00	2,479.00	30.00	2,010.00	50.00	3,350.00
18	Trench safety for gas lines	1,810	LF	5.00	9,050.00	3.50	6,335.00	2.00	3,620.00
<b>SUB-TOTAL BASE BID (ITEMS C1-C8):</b>					<b>\$191,639.00</b>		<b>\$194,565.00</b>		<b>\$256,430.00</b>
<b>TOTAL BASE BID A+B+C:</b>					<b>\$873,045.50</b>		<b>\$949,637.00</b>		<b>\$972,106.70</b>

TABULATION OF BIDS  
DEPARTMENT OF ENGINEERING - CITY OF CORPUS CHRISTI, TEXAS

Page 5 of 8

PREPARED BY: Angel R. Escobar, P.E., Acting Director of Engineering Services

DATE: Wednesday, March 10, 1999

TIME OF COMPLETION: 180 Calendar Days

ENGINEER'S ESTIMATE: \$833,000

1999 AIRLINE ROAD PHASE II (WOOLDRIDGE ROAD TO SARATOGA BLVD.) UTILITY ADJUSTMENTS PROJECT NO. 6055				Bay, Ltd. P.O. Box 9908 Corpus Christi, TX 78469-9908		Jalco Inc. P.O. Box 27368 Houston, TX 77227			
DESCRIPTION	QTY.	UNIT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	
A1	3,275	LF	24.70	80,892.50	107.00	350,425.00		0.00	
A2	655	LF	46.60	30,523.00	45.00	29,475.00		0.00	
A3	440	LF	21.70	9,548.00	51.00	22,440.00		0.00	
A4	3	EA	429.00	1,287.00	730.00	2,190.00		0.00	
A5	4	EA	418.00	1,672.00	725.00	2,900.00		0.00	
A6	4	EA	371.00	1,484.00	688.00	2,752.00		0.00	
A7	3	EA	276.00	828.00	620.00	1,860.00		0.00	
A8	8	EA	416.00	3,328.00	715.00	5,720.00		0.00	
A9	5	EA	393.00	1,965.00	685.00	3,425.00		0.00	
A10	2	EA	255.00	510.00	560.00	1,120.00		0.00	
A11	8	EA	220.00	1,760.00	551.00	4,408.00		0.00	
A12	14	EA	215.00	3,010.00	568.00	7,952.00		0.00	
A13	6	EA	133.00	798.00	514.00	3,084.00		0.00	
A14	8	EA	171.00	1,368.00	514.00	4,112.00		0.00	
A15	2	EA	186.00	372.00	545.00	1,090.00		0.00	
A16	1	EA	177.00	177.00	300.00	300.00		0.00	
A17	5	EA	86.00	430.00	219.00	1,095.00		0.00	
A18	20	EA	1,470.00	29,400.00	1,437.00	28,740.00		0.00	
A19	7	EA	880.00	6,160.00	872.00	6,104.00		0.00	
A20	4	EA	671.00	2,684.00	615.00	2,460.00		0.00	

TABULATION OF BIDS  
DEPARTMENT OF ENGINEERING - CITY OF CORPUS CHRISTI, TEXAS

Page 6 of 8

BIDULED BY: Ángel R. Escobar, P.E., Acting Director of Engineering Services

DATE: Wednesday, March 10, 1999

TIME OF COMPLETION: 180 Calendar Days

ENGINEER'S ESTIMATE: \$833,000

1999 AIRLINE ROAD PHASE II (WOOLDRIDGE ROAD TO SARATOGA BLVD.) UTILITY ADJUSTMENTS PROJECT NO. 6055				Bay, Ltd. P.O. Box 9908 Corpus Christi, TX 78469-9908		Jalco Inc. P.O. Box 27368 Houston, TX 77227			
DESCRIPTION	QTY.	UNIT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	
121 Fire hydrant connection Tee and valve w/box	10	EA	2,470.00	24,700.00	2,872.00	28,720.00		0.00	
122 12" diameter x 1/4" thick steel casing @ Sta. 40+37	85	LF	214.70	18,249.50	28.00	2,380.00		0.00	
123 12" diameter x 1/4" thick steel casing @ Sta. 46+44	75	LF	263.80	19,785.00	31.00	2,325.00		0.00	
124 12" diameter x 1/4" thick steel casing @ Sta. 49+30	75	LF	231.60	17,370.00	31.00	2,325.00		0.00	
125 16" diameter x 3/8" thick steel casing @ Sta. 35+12	70	LF	242.60	16,982.00	31.00	2,170.00		0.00	
126 16" diameter x 3/8" thick steel casing @ Sta. 56+20	80	LF	227.00	18,160.00	31.00	2,480.00		0.00	
127 16" diameter x 3/8" thick steel casing @ Sta. 59+35	80	LF	237.70	19,016.00	38.00	3,040.00		0.00	
128 20" diameter x 3/8" thick steel casing between Sta. 51+51 and Sta. 52+31	80	LF	775.80	62,064.00	50.00	4,000.00		0.00	
129 20" diameter x 3/8" thick steel casing @ Sta. 64+14	80	LF	172.80	13,824.00	50.00	4,000.00		0.00	
130 12" x 2" tapping saddle	9	EA	267.50	2,407.50	381.00	3,429.00		0.00	
131 2" dia. service line	9	EA	998.40	8,985.60	286.00	2,574.00		0.00	
132 Grout existing waterline (6", 8" and 12" dia.)	4,300	LF	7.44	31,992.00	7.00	30,100.00		0.00	
133 Pavement Repair	97	SY	37.00	3,589.00	53.00	5,141.00		0.00	
134 Trench safety for waterlines	4,370	LF	1.30	5,681.00	1.00	4,370.00		0.00	

TABULATION OF BIDS  
DEPARTMENT OF ENGINEERING - CITY OF CORPUS CHRISTI, TEXAS

Page 7 of 8

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	DESCRIPTION	QTY.	UNIT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT
A35	Ozone Advisory	2	EA	687.00	1,374.00	500.00	1,000.00		0.00
	<b>SUB-TOTAL BASE BID (ITEMS A1-A35):</b>				<b>\$442,376.10</b>		<b>\$579,706.00</b>		<b>\$0.00</b>
B1	2-12" diameter PVC Sanitary sewer Force main (under 8' cut)	3,200	LF	42.20	135,040.00	123.00	393,600.00		0.00
B2	12" x 90" D.I.M.J. Bends	4	EA	781.40	3,125.60	707.00	2,828.00		0.00
B3	12" x 45" D.I.M.J. Bends	8	EA	560.00	4,480.00	627.00	5,016.00		0.00
B4	12" x 22½° D.I.M.J. Bends	2	EA	420.00	840.00	413.00	826.00		0.00
B5	12" x 11¼" D.I.M.J. Bends	4	EA	342.00	1,368.00	413.00	1,652.00		0.00
B6	Air release valve including fiberglass manhole	4	EA	3,042.00	12,168.00	1,141.00	4,564.00		0.00
B7	16" diameter x 3/8" thick steel casing @ Sta. 51+04	90	LF	162.00	14,580.00	53.00	4,770.00		0.00
B8	2-20" diameter x 3/8" thick steel casing between Sta. 51+07.4 and Sta. 51+97.4	90	LF	896.00	80,640.00	112.00	10,080.00		0.00
B9	2-20" diameter x 3/8" thick steel casing @ Sta. 37+29	90	LF	406.00	36,540.00	112.00	10,080.00		0.00
B10	2-30" diameter x 1/2" thick steel casing at Sta. 35+66	90	LF	539.00	48,510.00	155.00	13,950.00		0.00
B11	Pavement Repair	150	SY	37.00	5,550.00	53.00	7,950.00		0.00
B12	Cement grout near the telephone manholes	12	CY	146.00	1,752.00	150.00	1,800.00		0.00
B13	60" dia. fiberglass manhole	1	EA	11,000.00	11,000.00	20,000.00	20,000.00		0.00

**TABULATION OF BIDS**  
**DEPARTMENT OF ENGINEERING - CITY OF CORPUS CHRISTI, TEXAS**

BULATED BY: Ángel R. Escobar, P.E., Acting Director of Engineering Services

DATE: Wednesday, March 10, 1999

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1999 AIRLINE ROAD PHASE II (WOOLDRIDGE ROAD TO SARATOGA BLVD.) UTILITY ADJUSTMENTS PROJECT NO. 6055				Bay, Ltd. P.O. Box 9908 Corpus Christi, TX 78469-9908		Jalco Inc. P.O. Box 27368 Houston, TX 77227			
	DESCRIPTION	QTY.	UNIT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT
B14	Trench safety for force main	3,200	LF	1.30	4,160.00	1.00	3,200.00		0.00
B15	Ozone Advisory	2	EA	687.00	1,374.00	500.00	1,000.00		0.00
	<b>SUB-TOTAL BASE BID (ITEMS B1-B15):</b>				<b>\$361,127.60</b>		<b>\$481,316.00</b>		<b>\$0.00</b>
	<b>SUB-TOTAL BASE BID A+B:</b>				<b>\$803,503.70</b>		<b>\$1,061,022.00</b>		<b>\$0.00</b>
C1	Installation ONLY of 6" wrapped steel gas line	3,000	LF	76.00	228,000.00	41.00	123,000.00		0.00
C2	Installation ONLY of 6"x6" welded Tee	2	EA	830.00	1,660.00	250.00	500.00		0.00
C3	Installation ONLY of 45" welded Bend 6"	12	LF	840.00	10,080.00	100.00	1,200.00		0.00
C4	Installation ONLY of 45 1/4" welded Bend 6"	2	EA	1,400.00	2,800.00	150.00	300.00		0.00
C5	Installation ONLY of 6" welded cap	4	EA	820.00	3,280.00	100.00	400.00		0.00
C6	Installation ONLY of 6" diameter welded lubricated plug valve	4	EA	1,700.00	6,800.00	250.00	1,000.00		0.00
C7	Pavement repair	67	LF	37.00	2,479.00	29.00	1,943.00		0.00
C8	Trench safety for gas lines	1,810	LF	7.00	12,670.00	1.25	2,262.50		0.00
	<b>SUB-TOTAL BASE BID (ITEMS C1-C8):</b>				<b>\$267,769.00</b>		<b>\$130,605.50</b>		<b>\$0.00</b>
	<b>TOTAL BASE BID + A+B+C:</b>				<b>\$1,071,272.70</b>		<b>*\$1,191,627.50</b>		<b>\$0.00</b>

\* Addition error in total total shown has been corrected



# City of Corpus Christi Plan Preparation Standards

## Table of Contents

### SECTION 1

### INTRODUCTION

- 1.0 Purpose and Use

### SECTION 2

### DRAWINGS

- 2.0 General
- 2.1 Ownership of Drawings
- 2.2 Reuse of Drawings
- 2.3 Standard City Sheets
- 2.4 City Drawing Index Numbers
- 2.5 AutoCAD Shape and Font Types
- 2.6 Minimum Lettering Size and Style
- 2.7 Arrangement of Drawings
- 2.8 Civil Drawings
- 2.9 Structural Drawings
- 2.10 Architectural Drawings
- 2.11 Mechanical Drawings
- 2.12 Electrical Drawings
- 2.13 Control Systems Drawings
- 2.14 Submittals
- 2.15 Professional Responsibilities
- 2.16 Identification of Design Professional
- 2.17 Report Requirements

### SECTION 3

### DESIGN STANDARDS

- 3.0 Standard Designs and Details
  - A. General
  - B. Current Standards
- 3.1 Storm Water Pollution Prevention Plan
- 3.2 Traffic Control Plan



## **SECTION 4 TYPICAL PLAN PREPARATION STANDARDS**

- 4.0 General
- 4.1 Consistency
- 4.2 Dimensions
- 4.3 Scales
- 4.4 Layout of Drawing
- 4.5 Orientation
- 4.6 Reference Information
- 4.7 Miscellaneous Plan Preparation Standards
  - A. Decals, Stick-on Drafting Aids, and Labels
  - B. Shading
  - C. Scales
  - D. Sections
  - E. Details
  - F. Titles
  - G. North Arrows
  - H. Title Blocks
  - I. Title Sheets
  - J. Line Weights
- 4.8 Units of Measurement
- 4.9 Revisions to Drawings

## **SECTION 5 SOFTWARE COMPATIBILITY**

- 5.0 General
- 5.1 Specific Software
- 5.2 Computer Disk Records

## **SECTION 6 SUBMITTALS**

- 6.0 General
- 6.1 Project Checklist
- 6.2 Drawings Review Checklist
- 6.3 Plan Executive Summary
- 6.4 60% Submittal
- 6.5 90% Submittal
- 6.6 100% Submittal
- 6.7 Re-Submittal
- 6.8 Final Submittal
- 6.9 Record Drawings

**SECTION 7**                      **MISCELLANEOUS PROJECT GUIDELINES**

- 7.0                      General
- 7.1                      Addenda
- 7.2                      Design Revisions During Construction
- 7.3                      Record Drawings

**SECTION 8**                      **SPECIFICATIONS**

- 8.0                      General

**APPENDIX**

- Exhibit No. 1 Typical City Title Sheet
- Exhibit No. 2 Typical City Drawing Sheets (3 sheets)
- Exhibit No. 3 Miscellaneous Plan Preparation Standards
- Exhibit No. 4 **Curb, Gutter, & Sidewalk Details (one sheet- Rev. 12-2004)**
- Exhibit No. 5 **Driveway Details (2 sheets- Rev. 12-2004)**
- Exhibit No. 6 City Standard Curb Ramp Details (3 sheets-Rev. 1-21-2002)
- Exhibit No. 7 Standard Water Details (5 sheets-Rev. 7-13-2001)
- Exhibit No. 8 **Sanitary Sewer Standard Details (5 sheets-Rev. 12-2-2004)**
- Exhibit No. 9 Standard Storm Water Details (2 sheets-Rev. 1-14-2002)
- Exhibit No. 10 **Storm Water Pollution Prevention Plan**
- Exhibit No. 11 Project Checklist (2 sheets)
- Exhibit No. 12 **Drawings Review Checklist (2 sheets)**
- Exhibit No. 13 **Samples and Other Guidelines**
  - a. **NEW Samples of Typical Addenda in City Format**
  - b. **Guidelines for Street Plan Sheets**
  - c. **Sample Contractor Qualification Language for Contract Documents**
  - d. **Sample A/E's Letter to 3 Lowest Bidders**
  - e. **Elements of a Design Memorandum**
  - f. **Sample Citizen Meeting Format**
  - g. **Traffic Control Details, twelve sheets revised**
- Exhibit No. 14 Plan/Profile and Demolition
- Exhibit No. 15 SCADA Documentation Standards

# SECTION 1

## INTRODUCTION

### 1.0 PURPOSE AND USE

The purpose of the *City of Corpus Christi Plan Preparation Standards* is to establish, define, and clarify the requirements for preparing **all** project drawings for the City of Corpus Christi (City), including private developer subdivision plans (as applicable). Projects funded by the Federal Aviation Agency (FAA) and the Texas Department of Transportation (TxDOT) may require compliance with their standards in addition to those outlined in this document.

This manual is the first step toward improving the process of producing project drawings for the City. All design professionals who participate in the process of generating design drawings for the City - City staff (in-house design), consultants, drafters, technicians, etc. - will comply with these standards. It is the intent of this manual to provide guidelines and establish standards in order to ensure that all project drawings are consistent and reflect high quality workmanship.

The requirements outlined in the following sections will be incorporated into the production of all designs and drawings submitted to the City. Deviation from that specified herein must be approved in writing by the Director of Engineering Services **prior** to the commencement of the work.

The design professional is responsible for ensuring the compliance of this document with any subordinate staff and sub-consultants. In addition, the design professional is responsible for the quality control of the project drawings throughout the design phase and prior to the submittal to the City for approval, in order to eliminate errors and omissions and reduce review time by City staff.

This manual is meant to be a working document and will be updated, as the City deems necessary; as such, **it is the responsibility of the design professional to confirm the latest version in use by the City.** The City will make available to the design professional with a copy of the latest revisions. The City invites written comments on the contents of this document and suggestions for further refinement. Submit all such correspondence to the Director of Engineering Services.

## SECTION 2

### DRAWINGS

#### 2.0 GENERAL

The following requirements will be incorporated into the production of all drawings for the City. Any deviation from the following must be approved in writing by the Director of Engineering Services prior to the commencement of the work.

#### 2.1 OWNERSHIP OF DRAWINGS

The City is the owner of all original drawings prepared by the design professional for a City project. The tracings (not the CADD drawing files) will be considered the original record copies for the project. At the completion of the design phase of the project, the design professional will deliver to the City all original drawings prepared by the design professional for a City project. The design professional may make a set of reproducible copies at his expense and retain same for his own future use.

In addition, at the completion of the construction project, the design professional will deliver a computer diskette and hard copy of all AutoCAD (DWG format R14 or latest release) generated record drawings to the City, as per Section 5, paragraph 5.2.

#### 2.2 REUSE OF DRAWINGS

The City hereby expressly reserves the right to copy and reuse the information shown on any drawings or CADD drawing files prepared by the design professional for any use it desires.

Furthermore, **such reuse will not obligate the City to pay the design professional any fee for such reuse.** The City understands that it will use this material at its own risk and agrees to hold harmless the design professional of any claim, liability, or cost arising out of such reuse.

#### 2.3 STANDARD CITY SHEETS

Drawings will be sized to 22" x 34" sheets, (that will reduce to 11" x 17" for half-size) with 21" x 32" drawing area, including the border lines and title block. Borders at the top, bottom and right edges will be ½" and there will be a 1- ½" margin at the left edge, for binding. Drawings must be produced using the standard City title block (see Exhibit No. 2, "Typical City Drawing Sheets"). Upon request, the City will furnish the design professional this information on diskette in AutoCAD format. Design professional's title block sheets **WILL NOT** be used. If plan and profile sheets or other gridded specialty sheets are needed, the design professional must splice the grid onto the standard City title block sheet.

## 2.4 CITY DRAWING INDEX NUMBERS

All drawings will be numbered according to the City's standard drawing numbering system. The design professional will obtain drawing numbers from the assigned City Project Manager at the "kick-off" meeting. The title sheet index must clearly identify the City's drawing number and sheet title for each drawing included in the set. Each drawing will identify the City's drawing number in the title block. If a design professional wishes to add his own company drawing numbers (and file path in small text), he may do so by adding his individual sheet numbers as indicated on the standard title block sheet in smaller numbers (see Exhibit No. 2).

## 2.5 AUTOCAD SHAPE AND FONT TYPES

Except in the case of a title sheet, the design professional will use only "standard" AutoCAD font types. Industry standard drafting procedures shall govern the use of line types to be used on project drawings. Typically, **all new work shall be shown with a solid, heavy line and existing conditions will be shown with lighter or dashed lines.**

## 2.6 MINIMUM LETTERING SIZE AND STYLE

From time to time, the City may use 11" x 17" drawing sets for bidding and construction. To facilitate this practice and the use of microfilm storage, a minimum lettering size is required on all drawings. The minimum size lettering, including all alpha-numeric symbols, will not be less than 3/32-inch high using all uppercase and vertical lettering. **The key to scale selection is that the drawings be readable if reduced to 11" x 17"**. The minimum gap between lines will be equal to one-half the letter height. Fancy, artistic lettering styles are not allowed. "Roman S" lettering is required.

## 2.7 ARRANGEMENT OF DRAWINGS

To simplify referencing during construction and after project completion, all drawings shall be separated by discipline insofar as possible and practical. For example, all electrical details and diagrams should be separate from mechanical (HVAC and plumbing) details. The drawings should be arranged in the following order (as applicable):

- Title Sheet (including sheet index, vicinity and location maps, City project title and number, design professional's identification, and approval signature(s))
- General Notes and Design Criteria (including control information, benchmarks, hydraulic and/or mechanical flow diagrams, as applicable, and a project layout)
- Quantity Sheet
- Civil Drawings
- Structural Drawings
- Architectural Drawings
- Mechanical Drawings
- Electrical Drawings

- Control Systems Drawings
- Storm Water Pollution Prevention Plan
- Traffic Control Plan

## 2.8 CIVIL DRAWINGS

The civil drawings normally include the following (as applicable):

- Existing Site Plan, Demolition Plan, and Site Plan
- Plan and Profile Sheets
- Details and Drainage Area

An existing site plan shall define existing features including structures, site work, drainage, etc. A demolition plan shall define the limits, as well as all pertinent details of the demolition. A site plan shall define the limits of the entire project. Plan and profile sheets shall show existing and proposed elevations, grades, rights of way, property lines, easements, and piping systems. Scales to be used in civil drawings are suggested for use as follows:

<u>Drawing</u>	<u>Suggested Scale</u>
Site Plan	1" = 20' to 1" = 50'
Plan and Profile, horizontal	1" = 20' to 1" = 50'
Plan and Profile, vertical	1" = 5' to 1" = 2'
Details	1/4" = 1'-0", 1" = 2'-0" to 1" = 10' (or NTS)

## 2.9 STRUCTURAL DRAWINGS

The structural drawings shall include, as required by project size and scope, the following:

- Structural Foundation Plans
- Sections and Elevations
- Details

The suggested scale for plan views shall be 1/4" = 1'-0" or 1/8" = 1'-0" minimum. The suggested scale for sections, elevations, and details be 1/2" = 1'-0" (or NTS).

## 2.10 ARCHITECTURAL DRAWINGS

The architectural drawings shall include, according to the size and scope of the project, the following (as applicable):

- Site Plan
- Floor Plans
- Schedules

- Building Elevations
- Building Cross Sections
- Wall Sections
- Exterior Details
- Interior Elevations
- Interior Details
- Reflected Ceiling Plan
- Roof Plans
- Miscellaneous Details
- Landscape and/or Irrigation Drawings

The floor plan is the main drawing in a set of architectural drawings. It is a plan view of the structure, as seen from above. The following scale standards are suggested for use:

<u>Drawing</u>	<u>Scale</u>
Floor, Roof, and Reflected Ceiling Plans	1/4" = 1'-0" or 1/8" = 1'-0"
Interior and Exterior Elevations	1/4" = 1'-0" or 1/8" = 1'-0"
Interior and Exterior Details	1/2" = 1'-0" or 3/4" = 1'-0" or 1" = 1'-0"
Sections	1/6" = 1'-0" (or NTS)

## 2.11 MECHANICAL DRAWINGS

The mechanical drawings are usually divided into two disciplines, and shall include the following:

Heating, Ventilating, and Air Conditioning:

- Utility Site Plan
- HVAC Plans
- Sections
- Details
- Schedules
- Schematics/Diagrams

Plumbing:

- Utility Site Plan
- Plumbing Plans
- Sections
- Details
- Schedules
- Schematics/Flow Diagrams

The following suggested scale standards apply:

<u>Drawing</u>	<u>Suggested Scale</u>
Plan Views	1/4" = 1'-0" or 1/8" = 1'-0" (min.) and shall match that used in the architectural floor plan
Details	1/2" = 1'-0" or 3/4" = 1'-0" or 1" = 1'-0" (or NTS)

## 2.12 ELECTRICAL DRAWINGS

The electrical drawings shall include the following:

- Electrical Site Plan
- Lighting Plans & Details
- Receptacle and Power Plans
- Communication Systems Plans & Details
- Line Diagrams
- Riser Diagrams
- Conduit and Feeder Schedules
- Panelboard Schedules
- Details, Legends, Symbols, etc.
- Control Panels

The following scale standards shall apply:

<u>Drawing</u>	<u>Suggested Scale</u>
Site Plans	1" = 20' to 1" = 50'
Plan Views	1/4" = 1'-0" or 1/8" = 1'-0" (min.) and shall match that used in the architectural floor plan
Details	1/2" = 1'-0" or 3/4" = 1'-0" or 1" = 1'-0"

## 2.13 CONTROL SYSTEMS DRAWINGS

The control systems drawings shall be organized as follows:

- General SCADA Architecture
- DSC I/O Documentation
- Logic Drawings



- Loop Sheets
- P & ID
- PFD
- Instrument Lists

The following scale standards shall apply:

<u>Drawing</u>	<u>Scale</u>
Plan Views	1/4" = 1'-0" or 1/8" = 1'-0" (min.) and shall match that used in the architectural floor plan
Details	1/2" = 1'-0" or 3/4" = 1'-0" or 1" = 1'-0"

## 2.14 SUBMITTALS

Clearly date submittal and indicate the type of submittal (60%, 90%, 100%, re-submittal, etc.). Each submittal shall be clearly marked with the following statement as outlined in Rule 131.138 Section (8) of the Texas Engineering Practices Act instead of a seal:

**SAMPLE**

THIS DOCUMENT IS  
RELEASED FOR THE  
PURPOSE OF REVIEW  
UNDER THE AUTHORITY  
OF \_\_\_\_\_  
P.E. # \_\_\_\_\_  
ON \_\_\_\_\_  
IT IS NOT TO BE USED  
FOR ANY OTHER  
PURPOSE.

After the City approves the 100% submittal, final completion drawings will be submitted by the design professional, complete with the design professional's seal, signature, and date.

## 2.15 PROFESSIONAL RESPONSIBILITIES

At the completion of the design phase, all original drawings must be sealed by the professional engineer, registered professional land surveyor, or registered architect responsible for the work portrayed on that drawing. All certifying individuals must be registered in the State of Texas. In case of multi-disciplined projects, the prime professional that executes the contract on behalf of the prime design professional will seal the title sheet and the overall project site plan(s). The registered professional may affix his seal on the original drawing, sign his name in ink below the seal, and date it.

No stick-on seals will be allowed. The consultant will comply with all requirements of the Texas Engineering Practices Act regarding sealing of interim review and completed drawings, etc. CADD or computer files are not considered the official original record copy.

All such files shall be clearly marked, as outlined in the Texas Engineering Practices Act instead of a seal. (see Section 2.14).

## **2.16 IDENTIFICATION OF DESIGN PROFESSIONAL**

Since the use of design professional's title block sheets is not allowed, design professionals furnishing professional services will insert the company name or affix the logo where shown on the standard City sheet (see Exhibit No. 2). The firm name or logo of the prime design professional must appear on every sheet. The names of subconsultants will be shown to the lower right of the title block on the sheets for which they are responsible.

## **2.17 REPORT REQUIREMENTS**

Documents for the Water Department must have the following on the first page:

### **TITLE**

Final or Draft Report  
City of Corpus Christi  
Project Number xxxx

### **Prepared for:**

Water Department  
City of Corpus Christi  
P.O. Box 9277  
Corpus Christi, TX 78469-9277  
(361) 857-1881

### **Prepared by:**

Company  
Address  
City, State, ZIP  
Phone  
Date of Report

## SECTION 3

### DESIGN STANDARDS

#### 3.0 STANDARD DESIGNS AND DETAILS

##### A. General

The City has developed standard designs and details for a variety of situations. These designs and details have been successfully used on many City projects. City policy is to use these designs and details in order to simplify design, construction, and maintenance, and thus reduce costs. However, it remains the design professional's responsibility to ensure the suitability of these details for the specific project requirements. The design professional is solely responsible for the design submitted under his seal. If the design professional determines that his design mandates a change in or from these standard details, he will discuss the proposed changes with the Director of Engineering Services or his representative (i.e. assigned City project manager) **prior** to making the proposed changes.

##### B. Current Standards

The following is a list of the standard designs and details currently adopted by the City's Engineering Services Department:

1. City Standard Curb, Gutter, & Sidewalk Details (Exhibit No. 4 – one sheet-Rev. 12-2004)
2. Driveway Details (Exhibit No. 5, two sheets- Rev. 12-2004)
3. City Standard Curb Ramp Details (Exhibit No. 6, three sheets-Rev. 1-21-2002)
4. Standard Water Details (Exhibit No. 7, five sheets-Rev. 7-13-2001)
5. Sanitary Sewer Standard Details (Exhibit No. 8, five sheets-Rev. 12-2-2004)
6. Storm Water Details (Exhibit No. 9, two sheets-Rev. 1-14-2002)
7. Storm Water Pollution Prevention Plan (Exhibit No. 10)
8. Plan Profile & Demolition (Exhibit No. 14)
9. SCADA Documentation Standards (Exhibit No.15)

The City will provide reproducible vellums (or AutoCAD files) of these details for the design professional to use, upon his request.

### **3.1 STORM WATER POLLUTION PREVENTION PLAN (SWPPP)**

The design professional will prepare a storm water pollution prevention plan for City project as required by regulatory permit. The plan will be prepared in accordance with current local, state, and federal requirements and will consist of a written plan and detailed plan sheet describing the specific locations where temporary erosion control and storm water pollution prevention measures are to be used. Permanent site stabilization will also be addressed in these documents.

The written plan may be included in the bid documents as a separate specification section and/or as notes on a detailed plan sheet. Pollution prevention plans must be prepared in accordance with EPA-832-R-005, and the following guidelines: Storm Water Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices and the City's Reference Documents: "*Storm Water Guidance Document for Assessment of Water Quality Impacts from New Flood Control Projects*", "*Guidance Document for Assessment of Water Quality Impacts from New Flood Control Projects*", and "*Guidance Document for Evaluation of Feasibility of Retrofitting Existing Flood Control Projects to Benefit Water*".

### **3.2 TRAFFIC CONTROL PLAN (TCP)**

The City's Traffic Engineer at the Traffic Engineering Department, third floor of City Hall, telephone (361) 880-3540, will provide instruction concerning traffic control plans preparation. The design professional shall prepare the TCP in accordance with City standards.

### **3.3 AMERICANS WITH DISABILITIES ACT (ADA) REQUIREMENTS**

The Design Professional is required to perform the following:

- Register project and pay all associated fees.
- Define project scope and clearly identify in the project plans the extent of Architectural Barrier elimination.
- Submit plans to TDLR or approved RAS (within 5 days of sealing documents) for review/comment/approval; incorporate all corrections/revisions into the contract documents (plans and specifications), during the bid phase.
- Schedule final TDLR inspection and assure that all comments/directives/etc. are incorporated into the project, as a condition of and prior to acceptance by CITY OF CORPUS CHRISTI.
- (See also Attachment A, to this section).

## Notice

Beginning January 1, 2002, Independent Contract Providers (ICPs) will no longer be authorized to perform plan review or inspections on behalf of TDLR. To perform the Department's review and/or inspection function, an individual will have to certify as registered Accessibility Specialist (RAS). The current registered Accessibility Specialist (RAS) are listed on TDLR web site at [www.license.state.tx.us/LicenseSearch](http://www.license.state.tx.us/LicenseSearch).

New rules pertaining to the Texas Architectural Barriers Act., Article 9102, Texas Civil Statutes were adopted effective June 17, 2001. Additionally, an emergency rule relating to fees was adopted effective November 7, 2001 and amended effective February 1, 2005.

Changes to the rules include qualifications for becoming a Registered Accessibility Specialist (RAS) and the associated fees. Persons interested in performing plan reviews and inspections for TDLR must apply to become a RAS. An application and checklist are available online [www.license.state.tx.us](http://www.license.state.tx.us) or by contacting Licensing and Registration at 800-803-9202 (within Texas) or 512-463-6599. Enter "0" to reach Customer Service or on web site at [www.license.state.tx.us](http://www.license.state.tx.us) , [customer.service@tdlr.state.tx.us](mailto:customer.service@tdlr.state.tx.us).

This information has also been posted on the TDLR web site at [www.license.state.tx.us](http://www.license.state.tx.us) If you have questions regarding the Registered Accessibility Specialist Program please refer to the Frequently Asked Questions published on the TDLR web site at [www.license.state.tx.us/ab/abfaq.htm](http://www.license.state.tx.us/ab/abfaq.htm) or contact TDLR Customer Service at the phone numbers referenced above.

## SECTION 4

### TYPICAL PLAN PREPARATION STANDARDS

#### 4.0 GENERAL

This section includes typical procedures for drafting standards.

#### 4.1 CONSISTENCY

**BE CONSISTENT!** Drafting techniques shall be consistent throughout the set of project drawings.

#### 4.2 DIMENSIONS

Show only the dimensions necessary for completion of work portrayed. If possible, show all dimensions outside the figure. When a dimension or figure is not to scale on a drawing, indicate this with “NTS” (not to scale), under the figure’s title, where the scale would be indicated.

#### 4.3 SCALES

Drawing scales shall be carefully selected to clearly show the required information. Suggested scales for particular drawings or details are indicated in Section 2.

#### 4.4 LAYOUT OF DRAWING

All drawings shall be laid out with ample space between drawing items and the borders to ensure sufficient space for dimensions, labels, notes, etc. The work shall be laid out in an orderly fashion, with sections following in consistent order (alphabetical or numerical).

#### 4.5 ORIENTATION

The north arrow shall be directed (pointed) up or to the left side of the sheet, if practical, and placed in the upper right hand corner of the sheet, if practical, and in approximately the same location on all drawings in the set (i.e., in the same location for all plan views be they structural, architectural, mechanical, electrical, etc.). If a vicinity map is used, ensure the orientation of its north arrow is the same as the plan view orientation. Plan views drawn by different disciplines for the same facility shall be laid out in the same orientation. On plan and profile sheets, plan views shall be situated **directly** above the profile section. **All station numbers along the baseline shall increase in numbers from left to right.**

Label orientation shall be as indicated in the example found in Exhibit No. 3.

## 4.6 REFERENCE INFORMATION

The drawings shall clearly identify construction benchmarks, base or control lines with stationing, bearings, curvature points, offsets, and all dimensions necessary to define the location, limits, size, and geometry of items to be constructed. Alignment data shall be tabulated to show stationing, coordinates, and curve data.

## 4.7 MISCELLANEOUS PLAN PREPARATION STANDARDS

### A. Decals, Stick-on Drafting Aids, and Labels

Decals, stick-on drafting aids, and labels must not be affixed to final original drawings. However, in the interest of saving drafting time, consultants may prepare a base sheet using these stick-ons and have a 4-mil film mylar (auto-positive, film quality) or vellum copy made at the completion of the design or construction phase and submit this as the final "record" original tracing, at no additional cost to the City.

### B. Shading

Certain kinds of shading (manual and stick-on) become illegible when a film mylar is made of an original drawing. The consultant will use cross-hatching or other means to avoid the loss of clarity.

### C. Scales

The consultant will clearly indicate the scale at which all details or plan views are drawn. In the case of a detail sheet where several details are drawn at different scales, each detail will show a separate scale beneath its identifying title. In the case of a plan sheet where all of the drawing is at one scale, the scale will be noted in the title block. In addition, engineering graphic scales will be used on all civil, site, and other plan drawings.

### D. Sections

Sections shall be **lettered** in consecutive order on each drawing. The direction of the section view is indicated by the direction of the arrow. Heavy dark lines indicate the location of the cutting plane, which must be located in the exact position where the section is cut. Reference mark text shall be placed so that it can be read from the bottom of the drawing. See example in Exhibit No. 3.

### E. Details

Details shall be **numbered** in consecutive order on each drawing. Reference mark text shall be placed so that it can be read from the bottom of the drawing. See example in Exhibit No. 3.

F. Titles

Titles shall be used on all drawings to name sections, elevations, plans, details, etc. They shall be located below and centered on the view to which they apply. All text in the title shall be placed so that it can be read from the bottom of the drawing.

G. North Arrows

North arrows shall be as shown on Exhibit 3. North arrows shall be the same size and configuration throughout a set of drawings.

H. Title Blocks

Title blocks will be completed as indicated in Exhibit No. 2. (See paragraph 4.10, DRAWING FORMAT)

I. Title Sheets

**All projects shall include a title sheet. This sheet shall include a sheet index, vicinity map, location map, project title, City assigned project number, and consultant's information. An example of a standard title sheet is found in Exhibit No. 1.** If the sheet index is too long to fit on the title sheet, it may be located on the second sheet, adjacent to the title block on the right-hand side of the sheet.

J. Line Weights

Normally there will be a differentiation between "existing" and "proposed" which can best be conveyed through use of varying line weights and shapes, that will still be legible when reduced and/or microfilmed. Linework portraying existing conditions must always be lighter or thinner than linework portraying the proposed work or installation.

Existing conditions - 0.10 (min.)

Proposed - 0.14 (min.)

#### 4.8 UNITS OF MEASUREMENT

The standard of measurement for all dimensions and quantities will be in English units of measure. Metric equivalents may be shown in parenthesis, if required.

#### 4.9 REVISIONS TO DRAWINGS

An equilateral triangle, (revision marker), shall encase the revision number. The



revision marker shall appear on the drawing near the changed or affected area(s). Also, cloud the affected area.

The first marked change of a drawing shall be number "1"; additional changes shall increase numerically. For all revisions, made to the drawings **after** the Director of Engineering has approved and signed the drawings, the revision marker, date, description of the revision, and the initials of the design professional who issued the revision, shall be entered in the revision block. When all of the available space for revision notes has been used, add more lines and increase the revision block. **DO NOT ERASE DOCUMENTATION IN A REVISION BLOCK!** Design revisions during construction are covered in Section 7.

#### **4.10 DRAWING FORMAT**

There are two (2) drawing formats currently acceptable to the City's Engineering Services Department. The format shown in Exhibit No. 2 is 11" x 17", half-size Title Block & Borders presentation. The 22" x 34", full-size Title Block & Borders are also available by selecting/deselecting the appropriate layers, within the AutoCAD environment. **DO NOT MIX FORMATS, I.E. HALF-SIZE BLOCK WITH FULL SIZE BORDERS, ETC.**

## SECTION 5

### SOFTWARE COMPATIBILITY

#### 5.0 GENERAL

The City engineering staff has adopted certain standard computer software for use in all of its in-house production of design drawings and specifications. In order to maintain ease of reference and later modification, the City requires its consultants to use this same software.

#### 5.1 SPECIFIC SOFTWARE

The software currently adopted by the City is **AutoCAD Release 2002**.

#### 5.2 COMPUTER DISK RECORDS

The design professional shall furnish the City with a copy of all electronic files on computer diskettes or CDs used in the preparation of the drawings. These disks should be submitted at the time the original drawings are finalized and delivered to the City for distribution to bidders. In addition, at the completion of the construction project, the design professional will deliver an electronic file of all AutoCAD (**DWG format 2002 or earlier**) generated record drawings to the City. A computer disk with the changes and information shall be furnished to the City in the time frame stated in the design professional's contract after the project's construction is completed, for record drawing purposes.

## **SECTION 6**

### **SUBMITTALS**

#### **6.0 GENERAL**

This section covers the type of submittals (60%, 90%, 100%, Re-submittals, Final Submittal) that are required by the City for review of the drawings for each project, and what shall be included in each type submittal. Each submittal shall be dated and the type of submittal indicated and clearly marked according to paragraph 2.14 "Submittals" of Section 2.0.

#### **6.1 PROJECT CHECKLIST**

A checklist of items (see Exhibit No. 11) is to be completed by the design professional and included with each submittal (except for the Final Submittal).

#### **6.2 DRAWINGS REVIEW CHECKLIST**

A checklist of items (see Exhibit No. 12) is to be completed by the design professional and included with each submittal (except for the Final Submittal).

#### **6.3 PLAN EXECUTIVE SUMMARY**

Included with each 60% submittal shall be a concise summary, which will identify and summarize the project by distinguishing key elements such as:

- Description (refer to the project design memorandum)
- Pipe Size or Building Size
- Pipe Material, etc.
- Pros/Cons of selections
- ROW requirements
- Permit and Regulatory requirements
- Easement requirements
- Embedment type
- Constructability, etc.
- Specific requirements of the City
- Standard specifications
- Non-standard specifications
- Any unique requirements
- Cost, alternatives, etc.
- Owner Permit Requirements and status

#### **6.4 60% SUBMITTAL**

Included in a 60% Submittal shall be the following:

- plans indicating the existing conditions and proposed improvements, including flowline information, proposed pipe routes, proposed layouts, etc.
- design calculations (if requested) and equipment criteria and selection information
- list of specifications to be used on the project
- completed Project Checklist (**MANDATORY** - See Exhibit #11)
- completed Drawings Review Checklist (**MANDATORY** – See Exhibit #12)
- completed Plan Executive Summary (**MANDATORY** – See section 6.3)
- electronic file of project design, as required, to be used by the Traffic Engineering to develop Traffic Control Plans.

## 6.5 90% SUBMITTAL

Included in a 90% Submittal shall be the following:

- a 90% submittal set of plans, including a cover sheet, vicinity and location maps, general notes, project layout, and details
- the City’s red-lined set of review comments from the 60% Submittal
- a 90% submittal set of specifications and contract documents
- preliminary opinion of probable construction costs
- completed Project Checklist (**MANDATORY** - see Exhibit #11)
- completed Drawings Review Checklist (**MANDATORY** – See Exhibit #12)

## 6.6 100% SUBMITTAL

Included in a 100% Submittal shall be the following:

- a 100% submittal set of plans
- the City’s red-lined set of review comments from the 90% Submittal
- a 100% submittal set of specifications and contract documents
- consultant’s opinion of probable construction costs
- **project layout and hydraulic analysis sheet(s)**

## 6.7 RE-SUBMITTAL

If the City should reject the design professional’s submittal as “not complete” for that stage of submittal, the design professional shall correct the deficiencies and re-submit under the same type submittal as was previously rejected.

## 6.8 FINAL SUBMITTAL

After the 100% Submittal is approved by the City, a final set of reproducible plans, specifications, and contract documents (with electronic file copy) shall be submitted by the design professional (with engineer’s seal and signature) as suitable for bidding.

## **6.9 RECORD DRAWINGS**

Contractor is responsible for providing to Engineer red-lined field documentation, addenda, change orders, and other applicable information for incorporation into record drawings. At the completion of the construction project, the design professional will deliver a hard copy “originals” and CD of all AutoCAD (**DWG format R2002 or earlier**) generated record drawings to the City, as per Section 5, paragraph 5.2.

## SECTION 7

### MISCELLANEOUS PROJECT GUIDELINES

#### 7.0 GENERAL

The following subsections have been developed to standardize the procedures involving preparation of project drawings. From time to time, the conditions involving a particular project may require a certain degree of deviation from these guidelines. In such cases, the design professional must submit an explanation of the necessity of such deviation to the Director of Engineering Services or his designated representative in writing and obtain his approval **prior** to implementing any revisions.

#### 7.1 ADDENDA

During the bidding phase, if the City or the design professional determines it is necessary to clarify, reword, add, or delete any information contained in the drawings, the design professional, unless otherwise directed by the Engineering Services Department, will prepare an addendum, in City format, and deliver it to the City for approval and distribution to all bidders, in a timely manner. An example of an addendum in City format can be found in Exhibit No. 13.

#### 7.2 DESIGN REVISIONS DURING CONSTRUCTION

During the course of construction, problems and questions occur in the field that necessitate changes, clarifications, or modifications (change order, etc.) in the construction drawings as originally prepared by the design professional. Many times, these changes are minor and do not affect the safety, suitability, or performance of a particular design. Other times, there are major changes. In order to protect the safety of the public, and to ensure the long-term performance of the facility, and to maintain the design professional's liability for the design, all significant changes should be reviewed with the design professional and his concurrence/approval obtained before the change is made. All revisions should be noted on the record drawings.

#### 7.3 RECORD DRAWINGS

In order to properly maintain existing facilities and construct new facilities, it is absolutely essential that all changes or deviations from the original design drawings be properly documented to reflect the actual field conditions. The Contractor is required to submit, at the completion of the project, a copy of drawings marked with field changes. It is the responsibility of the Contractor to ensure that proper records are kept during the course of construction. These records must accurately describe the final shape, size, location, elevation, components, and/or equipment used on a project if different from that originally specified. Furthermore, at the completion of the project, the Design Professional will then have these field changes permanently recorded on the final original set of drawings that will constitute the record drawings, with certification block (sign & date).

## **SECTION 8**

### **SPECIFICATIONS**

#### **8.0 GENERAL**

For the production of specifications for the proposed project, please refer to the City's standard contract documents on disk and hard copy, as updated and provided by the City Engineering Services Department.

#### **8.1 CONSTRUCTION AND UTILITY CASTINGS**

\* AASHTO-M-306 (See Attachment A, to this section).

# **SPECIFICATIONS FOR CONSTRUCTION AND UTILITY CASTINGS**

- Manhole Frames and Covers/Grates
- Catch Basin Inlets
- Curb and Gutter Inlets
- Ditch and Median Inlets
- Trench Drainage Inlets

## 1. Applicable Codes

A. Whenever reference is made to the furnishing of materials or testing thereof to conform to the Standards of any technical society, organization or body, it shall be construed to mean the latest standard, code specification or tentative specifications adopted and published at the time of advertisement for bids, even though reference has been made to an earlier standard. Such standards are made a part hereof to the extent, which is indicated or intended.

B. The following are names and abbreviations of such groups:

AASHTO	for American Association of State Highway and Transportation Officials
ACI	for American Concrete Institute
AISC	for American Institute of Steel Construction
ANSI	for American National Standards Institute
API	for American Pipe Institute
ASA	for American Standards Association
ASCE	for American Society of Civil Engineers
ASTM	for American Society of Testing Materials
AWSC	for American Welding Society Code
AWWA	for American Water Works Association
CIPRA	for Cast Iron Pipe Research Association
Fed. Spec	for Federal Specification
NPCI	for National Clay Pipe Institute
SDHPT	for State Department of Highways and Public Transportation
UL Inc.	for Underwriter's Laboratories, Inc.
UPPA	for Uni-Bell Plastic Pipe Association

C. Where no reference is made to a code, standard or specification, the Standard Specification of ASTM, AWWA, or ANSI, as appropriate, shall govern.

D. If the specifications and drawings show requirements that are in excess of codes and ordinances, then the specifications and drawings shall be followed. Should there be any conflicts between the specifications and drawings, and the codes and ordinances having jurisdiction, the Bidder shall report these in his bid.

## 2. General

This specification is applicable for gray and ductile iron castings for frames, grates, rings, and covers that are for use by the City of Corpus Christi, Texas. Castings shall be manufactured by East Jordan Iron Works, or other approved USA manufacturer. The approved manufacturer shall be able to demonstrate that there is an acceptable quality control program at the producing foundry, prior to supplying castings.



3. **Materials**

Gray iron castings shall be manufactured from iron conforming to ASTM A48 Class 35B, as noted in section 3.1 of AASHTO M306. Ductile iron castings shall be manufactured from iron conforming to ASTM A536. The iron material used in products provided shall have a minimum recycled material content of 75%. The recycled materials shall consist of post-consumer material.
4. **Manufacture**

Castings shall be of uniform quality, free from sand holes, gas holes, shrinkage, cracks and other surface defects. Castings shall be reasonably smooth and well cleaned by shot blasting. For traffic service castings, bearing surfaces between manhole rings and covers or grates and frames shall be ground or machined with such precision to prevent rocking. As-cast dimensions may vary within accepted foundry tolerances as outlined in the Iron Castings Handbook published by the American Foundrymen's Society, Inc. Nominally, casting dimensional tolerances shall be +/- 1/16" per foot. All published casting weights are average and approximate values and shall vary +/- 5%. Castings shall be furnished painted or unpainted as specified by the purchaser.
5. **Workmanship**

Castings shall show careful finished workmanship in all particulars. Castings which have been damaged either during manufacture or shipping may be rejected. Defects which would constitute poor workmanship include pinholes, shrink, crack, dirt, scab, and slag.
6. **Sampling**

Random checks on the castings may be conducted by the purchaser. These random checks shall be conducted in accordance with the AASHTO M306 Section 6.0 guidelines.
7. **Proof Load Testing**

Traffic service castings shall have a first article proof load test conducted and the results of that proof load shall be made available to the purchaser upon request. The proof load shall be conducted in accordance with the method and procedure that is outlined in AASHTO M306 Section 7.0, proof load testing. The casting shall be tested on a suitable and calibrated load testing machine and the casting shall hold a 40,000 pound proof load for one minute without experiencing any cracks or detrimental permanent deformation.
8. **Inspection**

Inspections shall be in accordance with 9.1.1 (refer to #7 above-Proof Load Testing) or 9.1.2 of AASHTO M306. Results of these tests shall be furnished to the purchaser upon request. The heat or production date and product numbers, as cast on the casting shall be the basis of trace-ability and recording of the tests.
9. **Certification**

A foundry certification shall be furnished to the purchaser stating that samples representing each lot have been tested, inspected, and are in accordance with this specification.

10. Marking

Each casting shall be identifiable and show, at a minimum, the following: name of the producing foundry, country of manufacture (such as "Made in USA"), ASTM material designation, recycle symbol, individual part number, cast or heat date. Castings shall also include all lettering as shown on the specification drawings.

11. Records

Test results for each lot of castings shall be maintained by the foundry for a minimum of seven years and shall be available to the purchaser upon request.

# APPENDIX

## Index

- Exhibit No. 1 Typical City Title Sheet
- Exhibit No. 2 Typical City Drawing Sheets (3 sheets)
- Exhibit No. 3 Miscellaneous Plan Preparation Standards
- Exhibit No. 4 **Curb, Gutter, & Sidewalk Details (one sheet-Rev. 12-2004)**
- Exhibit No. 5 **Driveway Details (2 sheets-Rev. 12-2004)**
- Exhibit No. 6 City Standard Curb Ramp Details (3 sheets-Rev. 1-21-02)
- Exhibit No. 7 Standard Water Details (5 sheets-Rev. 7-13-2001)
- Exhibit No. 8 **Sanitary Sewer Standard Details (5 sheets-Rev. 12-2-2004)**
- Exhibit No. 9 Standard Storm Water Details (2 sheets-Rev. 1-14-2002)
- Exhibit No. 10 **Storm Water Pollution Prevention Plan Details – SAMPLE ONLY**
- Exhibit No. 11 Project Checklist (2 sheets)
- Exhibit No. 12 **Drawings Review Checklist (2 sheets)**
- Exhibit No. 13 **Samples and Other Guidelines**
- a. **New' Sample Addendum in City Format**
  - b. **Guidelines for Street Plan Sheets**
  - c. **Sample Contractor Qualification Language for Contract Documents**
  - d. **Sample A/E's Letter to 3 Lowest Bidders**
  - e. **Elements of a Design Memorandum**
  - f. **Sample Citizen/s Meeting Format**
  - g. **Sample Traffic Control Details**
  - h. **New Construction Plan Sample (Wesley Seale Dam Operations Center  
Emergency Generator)**
- Exhibit No. 14 Plan/Profile and Demolition
- Exhibit No. 15 SCADA Documentation Standards

**EXHIBIT NO. 1**

**TYPICAL CITY**  
**TITLE SHEET**

**PROJECT LOCATION**  
 PHYSICAL ADDRESS  
 CORPUS CHRISTI, TEXAS

**CALL BEFORE YOU DIG!**



TEXAS ONE CALL PARTICIPANTS REQUEST  
 48 HOURS NOTICE BEFORE YOU DIG,  
 DRILL, OR BLAST - STOP AND CALL  
**Texas One Call System**  
 1-800-245-4545

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**SOUTHWESTERN BELL LOCATE GROUP**  
 AT 1-800-828-5127

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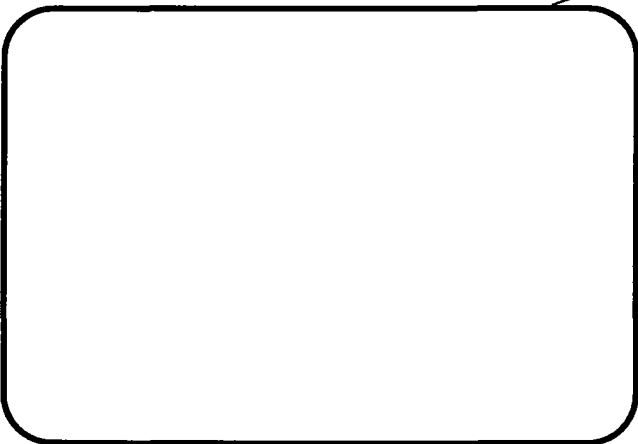
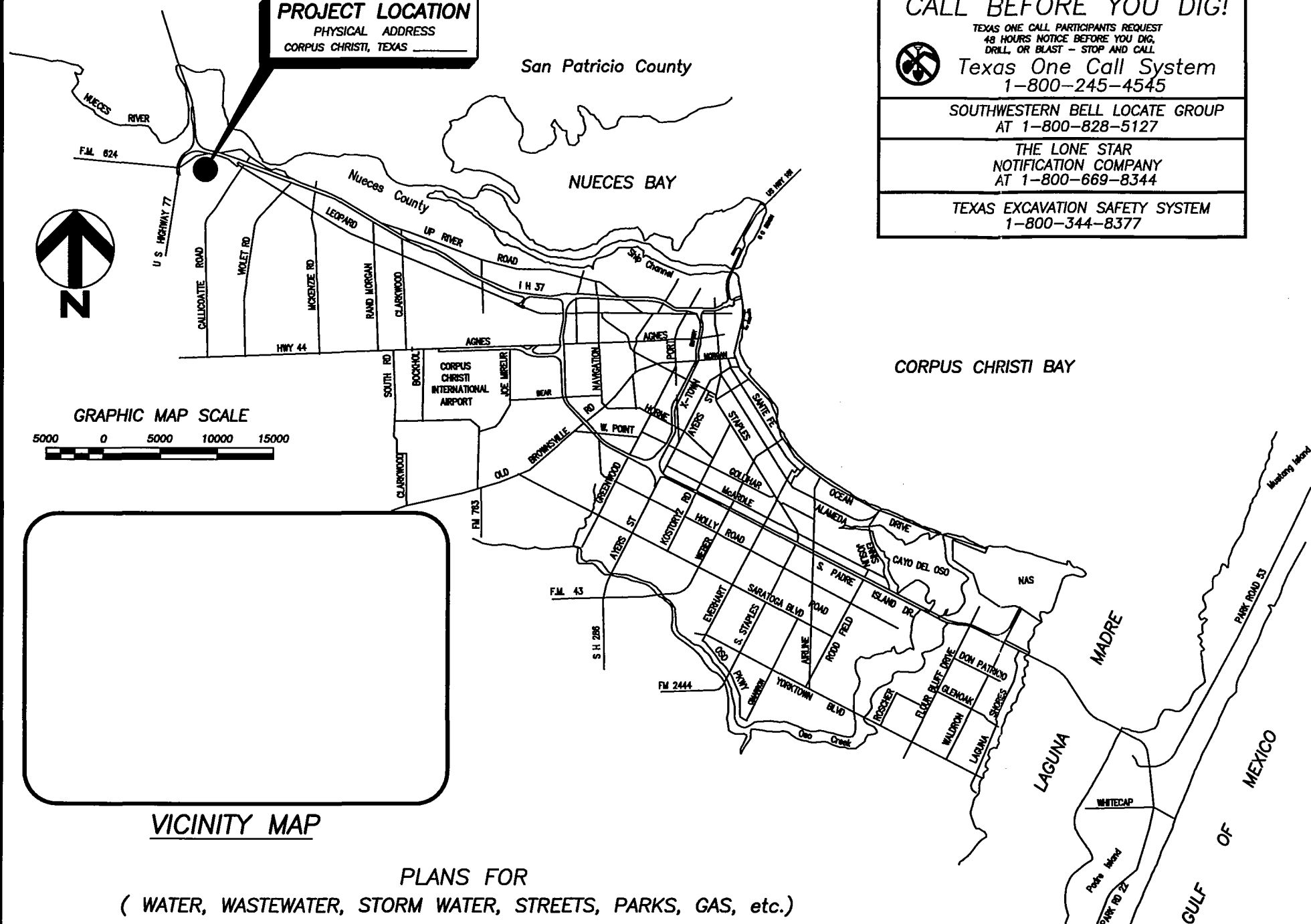
**THE LONE STAR NOTIFICATION COMPANY**  
 AT 1-800-669-8344

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**TEXAS EXCAVATION SAFETY SYSTEM**  
 1-800-344-8377

SHEET INDEX	
SHEET NO.	DESCRIPTION
1.	TITLE SHEET

CONSULTANT'S SHEET NO.  
 CONSULTANT'S PROJECT NO.



**VICINITY MAP**

**EXHIBIT 1**  
 Sheet 1 of 1

PLANS FOR  
 ( WATER, WASTEWATER, STORM WATER, STREETS, PARKS, GAS, etc.)

**PROJECT NAME**

( FY \_\_\_\_\_ )  
 PROJECT # \_\_\_\_\_

PREPARED BY  
 ( CONSULTANT'S NAME )  
 ( CONSULTANT'S ADDRESS )  
 ( CONSULTANT'S PHONE # )

— Add middle block with designated O.N. Stevens' Water Projects Only  
 — Add top block with designated Water Projects Only

APPROVED: \_\_\_\_\_ Date \_\_\_\_\_  
 Water Department Superintendent

APPROVED: \_\_\_\_\_ Date \_\_\_\_\_  
 Water Production Superintendent

APPROVED: \_\_\_\_\_ Date \_\_\_\_\_  
 Director of Engineering Services

 <b>CITY of CORPUS CHRISTI TEXAS</b> Department of Engineering Services		<b>TITLE SHEET</b>
REVISION NO.	DATE	DESCRIPTION

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**EXHIBIT NO. 2**

**TYPICAL CITY**  
**DRAWING SHEET**



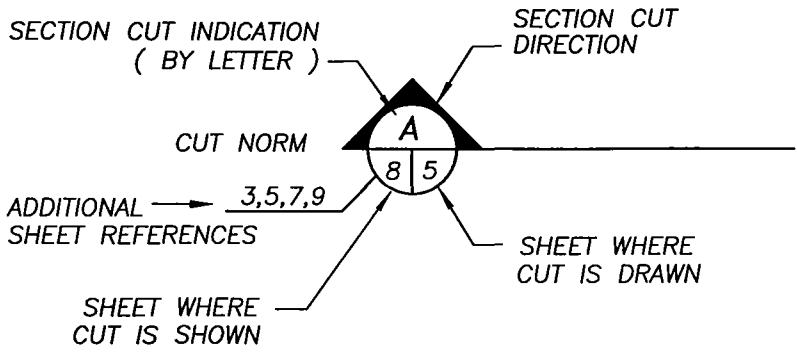




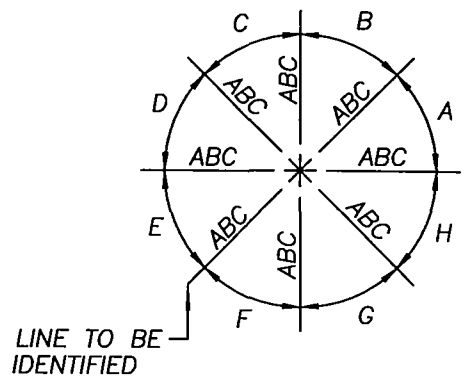


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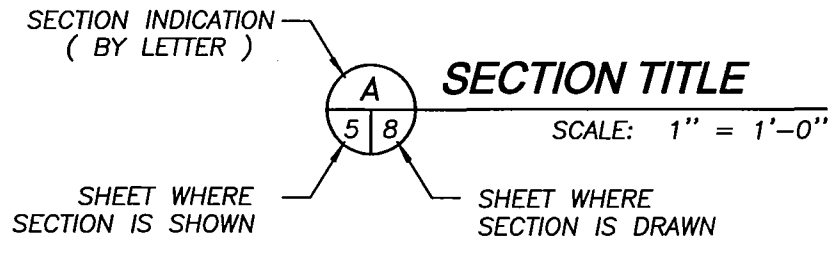
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**PLAN PREPARATION**  
**STANDARDS**



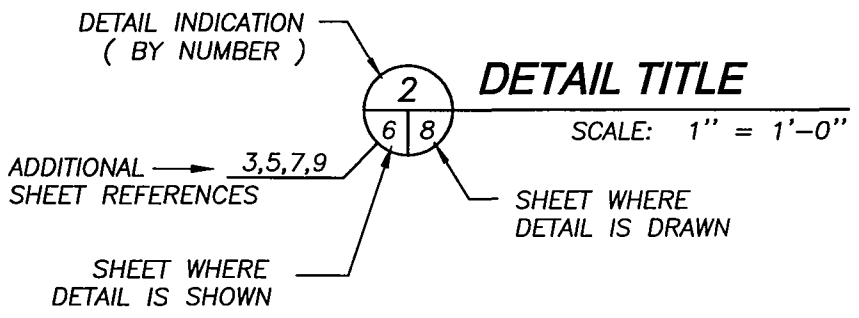
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**LABEL ORIENTATION**



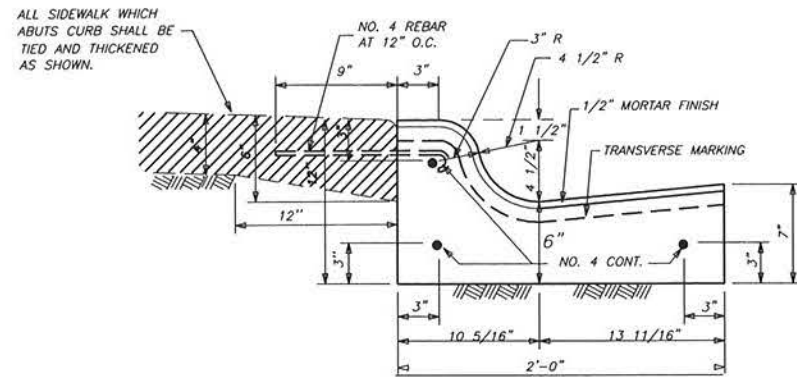
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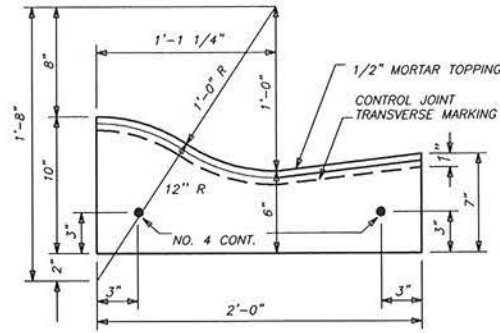
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**CURB, GUTTER &**  
**SIDEWALK DETAILS**



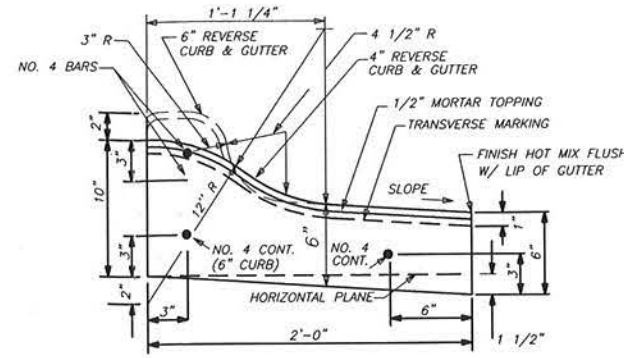
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NOT TO SCALE



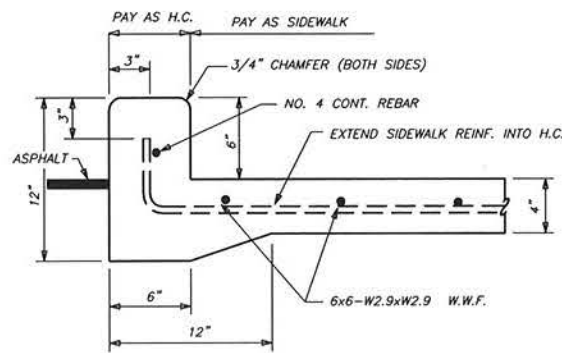
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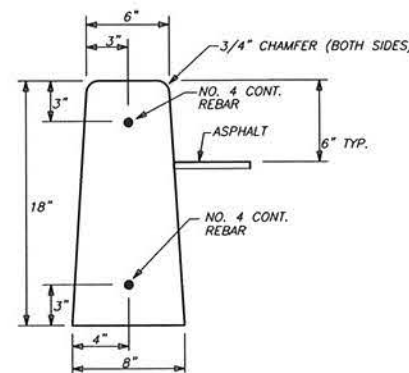
TYP. REVERSE CURB & GUTTER DETAIL

NOT TO SCALE



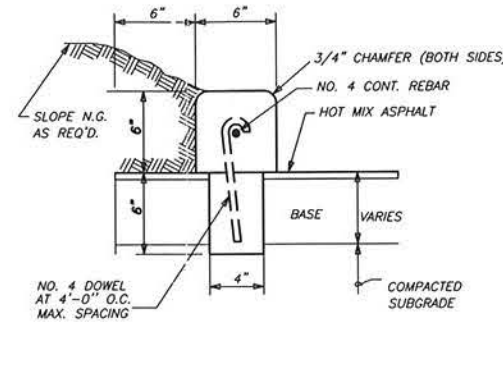
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NOT TO SCALE



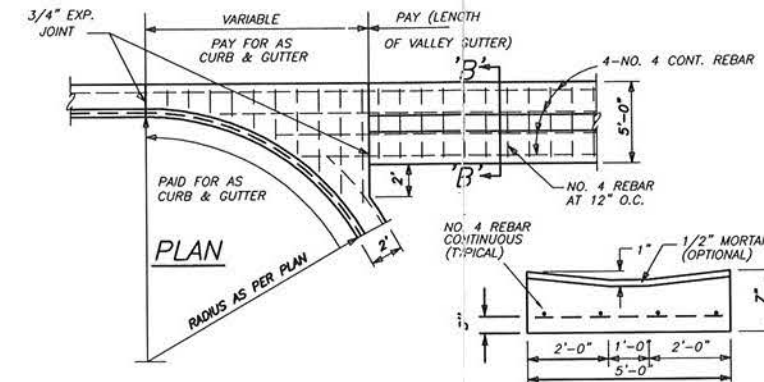
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NOT TO SCALE



TYPE "C" HEADER CURB DETAIL

NOT TO SCALE



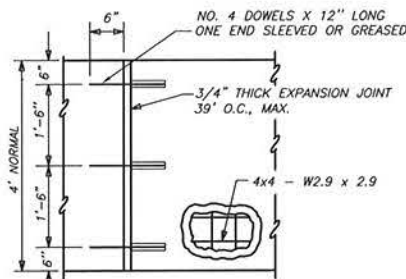
5' VALLEY GUTTER DETAIL

NOT TO SCALE

NOTE: EXTEND PRINCIPAL REINF. 12" THRU EXP. JOINT AND SLEEVE OR GREASE

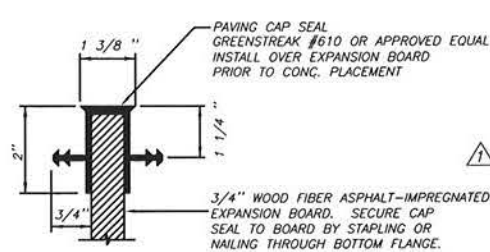
SECTION "B-B"

NOT TO SCALE



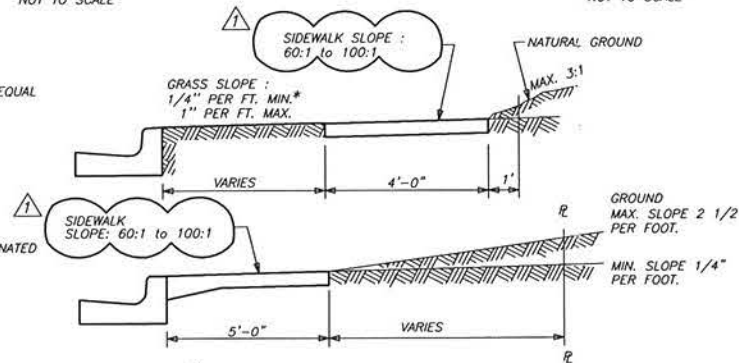
PLAN OF STD. SIDEWALK

NOT TO SCALE



CAP SEAL DETAIL  
NEW CONC. TO NEW CONC.

NOT TO SCALE



SURFACE & SIDEWALK SLOPE BEHIND CURB

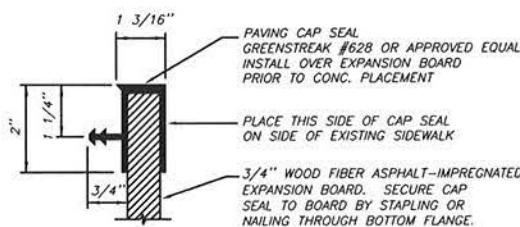
NOT TO SCALE

STANDARD CURB & GUTTER AND HEADER CURB NOTES:

- ALL CONCRETE CLASS "A" 3,000 P.S.I. ALL STEEL GRADE 60  $f_y = 60,000$  P.S.I., MIN.
- TRANSVERSE GROOVES 1/8" WIDE BY 1/2" DEEP SHALL BE MADE IN ALL CURB & GUTTER AND HEADER CURB AT 10' O.C. (MAXIMUM).
- 3/4" THICK EXPANSION JOINTS SHALL BE PROVIDED AT 39'-0" CENTERS (MAXIMUM). REINFORCEMENT SHALL CONSIST OF THE NUMBER 4 DOWELS X 12" LONG SPACED AT 18" O.C. (MAX.). THE NO. 4 DOWEL SHALL BE EXTENDED ACROSS THE JOINT 9 INCHES AND THIS END SHALL BE SLEEVED OR GREASED.
- WHERE NEW CURB & GUTTER OR HEADER CURB JOINS EXISTING CURB & GUTTER, TRANSITION THE LAST 10' OF THE NEW TO MATCH THE OLD IN SHAPE.
- FOR HEADER CURB NO. 4 DOWEL, MACHINE DRILL A 4" DIA. HOLE AT 4 FEET O.C. (MAX.) AFTER ASPHALT IS LAID AND COMPACTED. DOWELS SHALL NOT BE DRIVEN DIRECTLY INTO ASPHALT AS A METHOD FOR SECURING HEADER CURB TO PAVEMENT.
- BASE AND SUB-BASE THICKNESS UNDER CONCRETE CURBS TO BE AS SPECIFIED IN PROJECT SPECIFICATIONS, AS PER LOADING DESIGN CONDITIONS.
- FINAL ACCEPTANCE OF THE PROJECT SHALL BE CONTINGENT UPON THE CONTRACTOR PROVIDING THE CITY WITH A CERTIFICATION LETTER, FROM THE TEXAS DEPARTMENT OF LICENSING AND REGULATION (TDLR), POLICY AND STANDARDS DIVISION, ARCHITECTURAL BARRIERS SECTION, THAT ALL ADA (AMERICANS WITH DISABILITIES ACT) HANDICAP IMPROVEMENTS, AS CONSTRUCTED, COMPLY WITH THE TEXAS ACCESSIBILITY STANDARDS (TAS) OF THE ARCHITECTURAL BARRIERS ACT ARTICLE 9102, TEXAS CIVIL STATUTES.

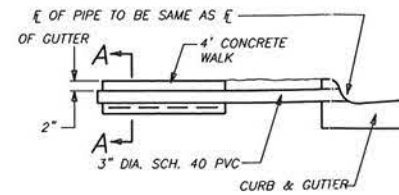
SIDEWALK NOTES :

- ALL EXPANSION JOINTS TO BE 3/4" THICK WOOD FIBER ASPHALT-IMPREGNATED, UNLESS OTHERWISE NOTED.
- ALL CONCRETE CLASS "A", 3,000 psi. ALL STEEL, GRADE 60,  $f_y = 60,000$  psi.



CAP SEAL DETAIL  
NEW CONC. TO EXIST. CONC.

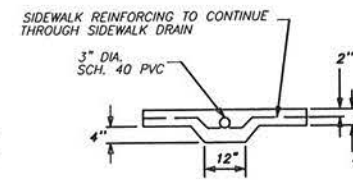
NOT TO SCALE



TYPICAL SECTION

SIDEWALK DRAIN DETAIL

NOT TO SCALE



SECTION "A-A"

IN CASE OF CONFLICT, DESIGN ENGINEER'S PLANS/SPECS/STDS SHALL TAKE PRECEDENCE

SLOPE CHANGES ADDENDUM NO. 1

REVISION NO.	DATE	DESCRIPTION

CURB, GUTTER AND SIDEWALK DETAILS

STANDARD DETAILS

CITY OF CORPUS CHRISTI  
TEXAS  
Department of Engineering Services



SHEET 1 of 1  
RECORD DRAWING NO.

CITY PROJECT #

**EXHIBIT NO. 5**

**CITY STANDARD FOR:**

**DRIVEWAY DETAILS**

**(Standards will be provided at a later date)**



**DRIVEWAY NOTES:**

- GRADES FOR WALKWAY AREAS WITHIN DRIVEWAYS SHALL NOT EXCEED 25:1 ALONG THE DIRECTION OF PEDESTRIAN TRAVEL, LONGITUDINAL, EITHER WITHIN THE DRIVEWAY OR AT THE SIDEWALK APPROACHES ABUTTING THE DRIVEWAY. CROSS-SLOPE, TRANSVERSE SLOPE, OF WALKWAY SHALL BE BETWEEN 100:1 AND 60:1.
- DRIVEWAY RAMP SLOPE SHALL NOT EXCEED 10:1, EXCEPT UNDER SPECIAL CIRCUMSTANCES, IF AUTHORIZED BY THE ENGINEER.
- CONCRETE FOR DRIVEWAYS SHALL BE CLASS "A" (3000 PSI) AND HAVE A MINIMUM THICKNESS OF 6 INCHES.
- RE-BAR SHALL BE GRADE 60, WITH A MAXIMUM SPACING OF 12" ON CENTERS AND ADDITIONAL DIAGONAL BARS AS SHOWN.
- EXPANSION JOINTS SHALL BE OF 3/4" THICK AND DOWELS SHALL BE GREASED, 12" LONG, SMOOTH #4 BARS WITH ONE END BEING FELT WRAPPED. CONTINUOUS BARS SHALL NOT EXTEND THROUGH THE EXPANSION JOINT, BUT SHALL TYPICALLY STOP 3" CLEAR OF THE EXPANSION JOINT.
- MIDDLE EXPANSION JOINT SHALL BE USED, IF THE DRIVEWAY WIDTH, W, IS 16 FEET OR WIDER. THE EXPANSION JOINT SHALL EXTEND FROM THE BACK OF WALKWAY TO THE LIP OF CURB.
- FINAL ACCEPTANCE OF THE PROJECT SHALL BE CONTINGENT UPON THE CONTRACTOR PROVIDING THE CITY WITH A CERTIFICATION LETTER, FROM THE TEXAS DEPARTMENT OF LICENSING AND REGULATION (TDLR), POLICY AND STANDARDS DIVISION, ARCHITECTURAL BARRIERS SECTION, THAT ALL ADA (AMERICANS WITH DISABILITIES ACT) HANDICAP IMPROVEMENTS, AS CONSTRUCTED, COMPLY WITH THE TEXAS ACCESSIBILITY STANDARDS (TAS) OF THE ARCHITECTURAL BARRIERS ACT ARTICLE 9102, TEXAS CIVIL STATUTES.

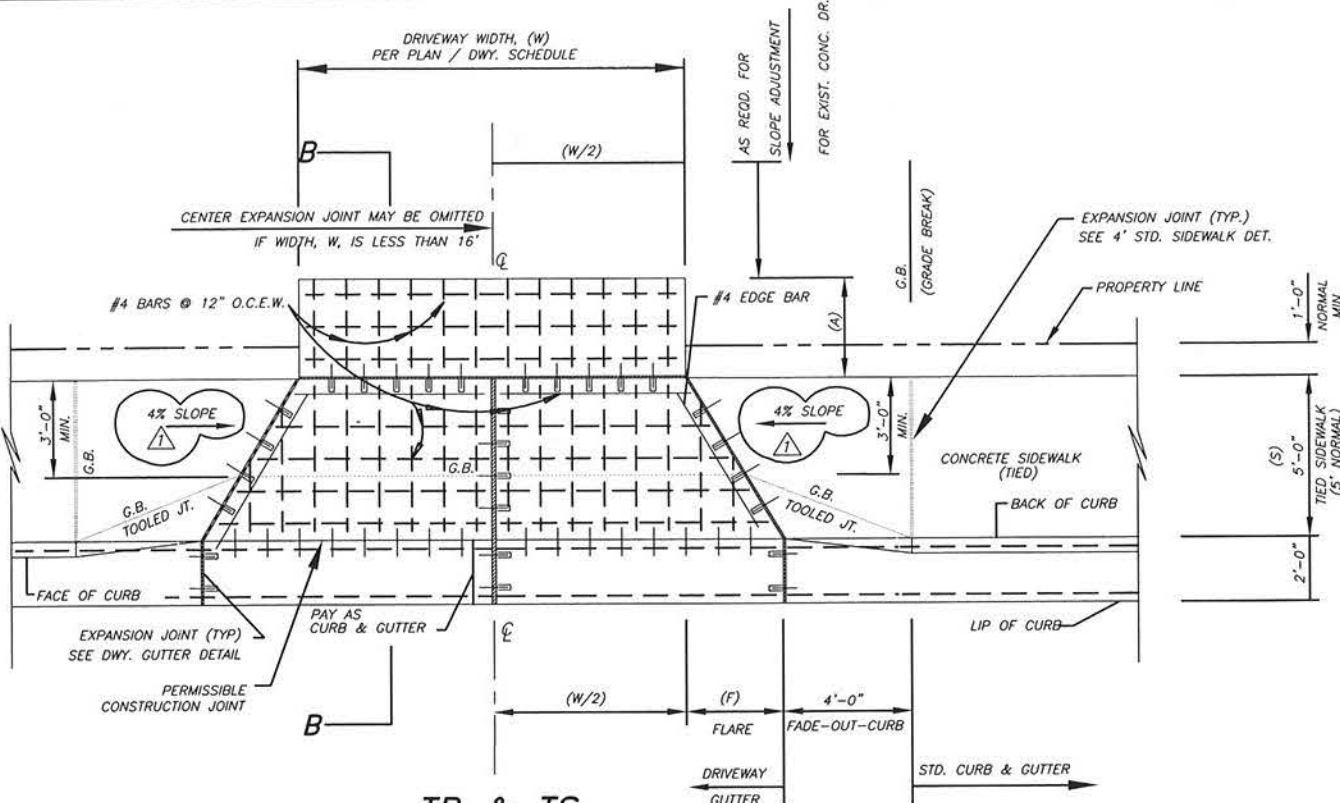
**STANDARD DRIVEWAY DIMENSION**

DWY. TYPE	F <sup>a</sup> (FT.)	W <sup>b</sup> (FT.)	M (FT.)
R	5	10-30	
C	10	16-35	
S	15		
MRA	5	10-30	5-10
MRB	5	10-30	<5
MCA	10	16-35	10-20
MCB	10	16-35	<10
TR	3	10-30	
TS	5	<16	
TMR	3	10-30	<6
TMS	5	<16	<10

<sup>a</sup> VALUE OF F MAY BE CHANGED BY ENG.  
<sup>b</sup> RANGE OF NORMALLY ACCEPTABLE VALUES.

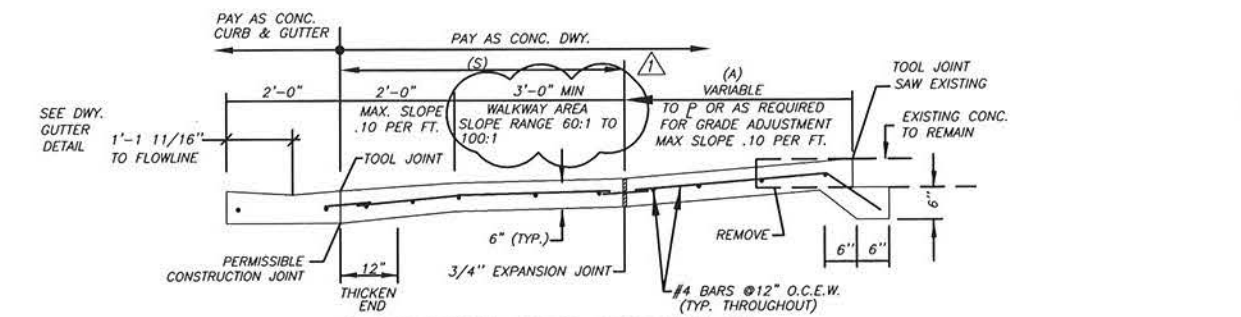
**LEGEND (DRIVE TYPE)**

- R = RESIDENTIAL DRIVEWAY
- C = COMMERCIAL DRIVEWAY
- S = SPECIAL DRIVEWAY
- MRA = MULTIPLE RESIDENTIAL DRIVEWAY WITH DIVIDER CURB
- MRB = MULTIPLE RESIDENTIAL DRIVEWAY WITH NO DIVIDER CURB
- MCA = MULTIPLE COMMERCIAL DRIVEWAY WITH DIVIDER CURB
- MCB = MULTIPLE COMMERCIAL DRIVEWAY WITH NO DIVIDER CURB
- TR = TIED RESIDENTIAL DRIVEWAY
- TS = TIED SPECIAL DRIVEWAY
- TMR = TIED MULTIPLE RESIDENTIAL DRIVEWAY
- TMS = TIED MULTIPLE SPECIAL DRIVEWAY

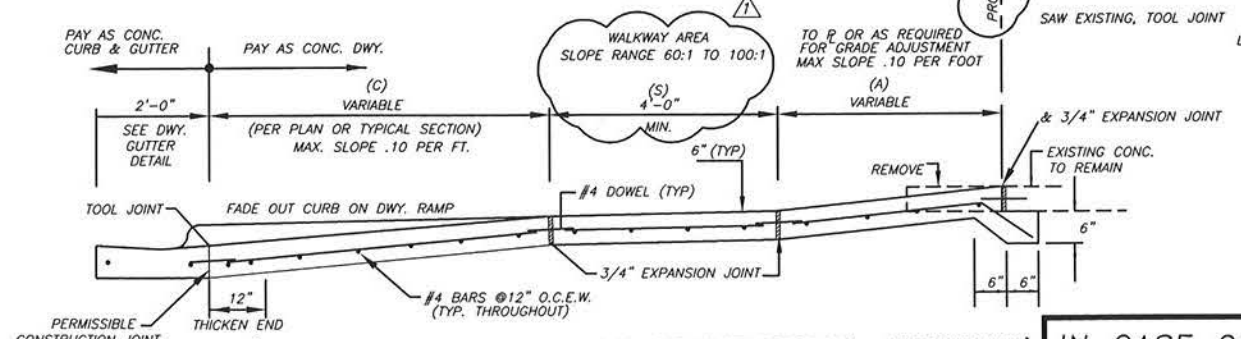


**TR & TS DRIVEWAY - PLAN**  
(WITH 5'-0" TIED SIDEWALK)  
NOT TO SCALE

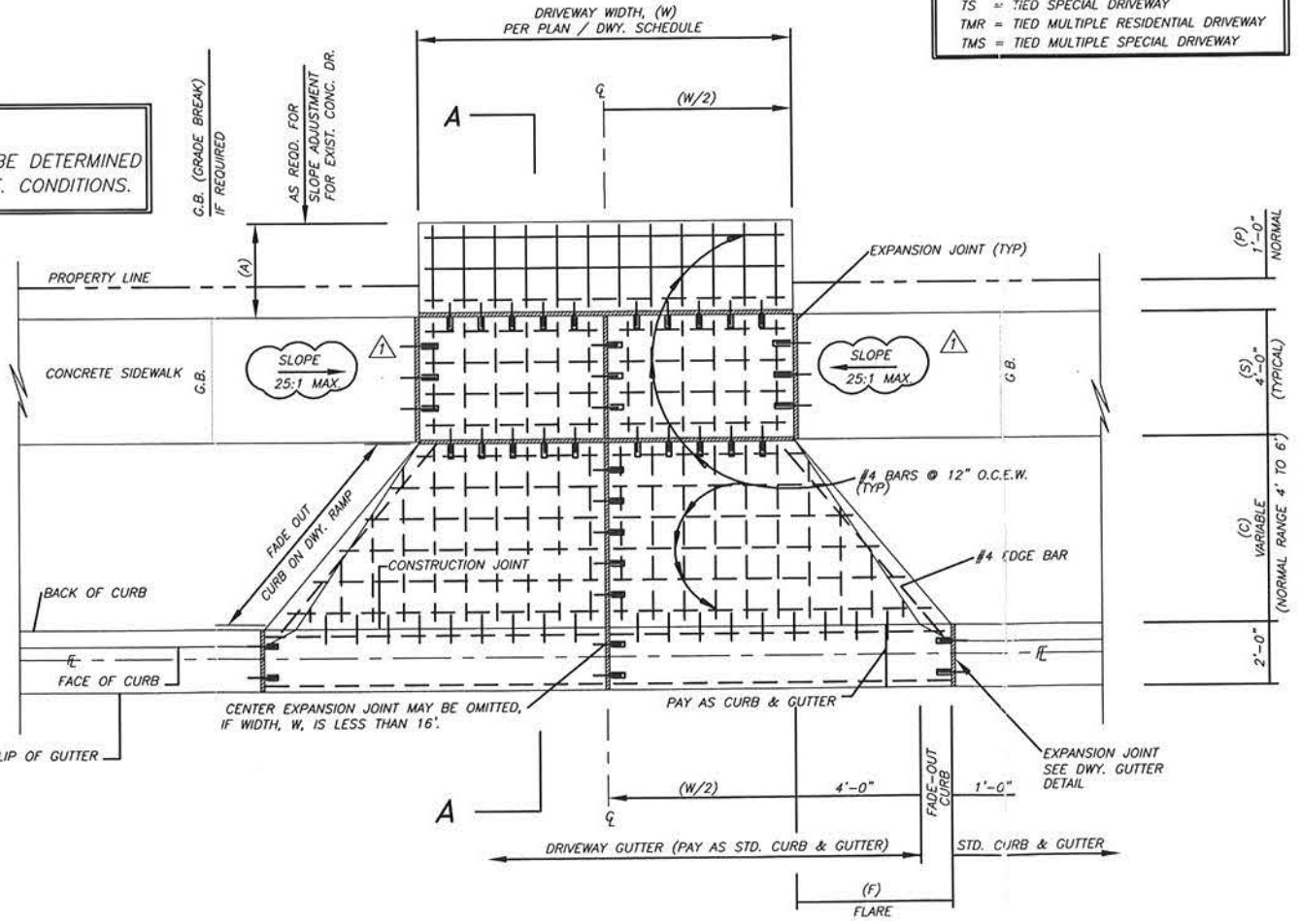
**SPECIAL NOTE :**  
THE EXACT TYPE OF DRIVEWAY TO BE DETERMINED BY THE ENGINEER, BASED ON EXIST. CONDITIONS.



**(ADJOINING TIED SIDEWALK) TR & TS DRIVEWAY - SECTION B-B**  
NOT TO SCALE



**(ADJOINING DETACHED OR CONVENTIONAL SIDEWALK) R DRIVEWAY - SECTION A-A**  
NOT TO SCALE



**R DRIVEWAY - PLAN**  
NOT TO SCALE

**IN CASE OF CONFLICT, DESIGN ENGINEER'S PLANS/SPECS/STDS SHALL TAKE PRECEDENCE**

FILE: /MProject/lat s/stdorig/stdrrwy1.dwg 4-2004

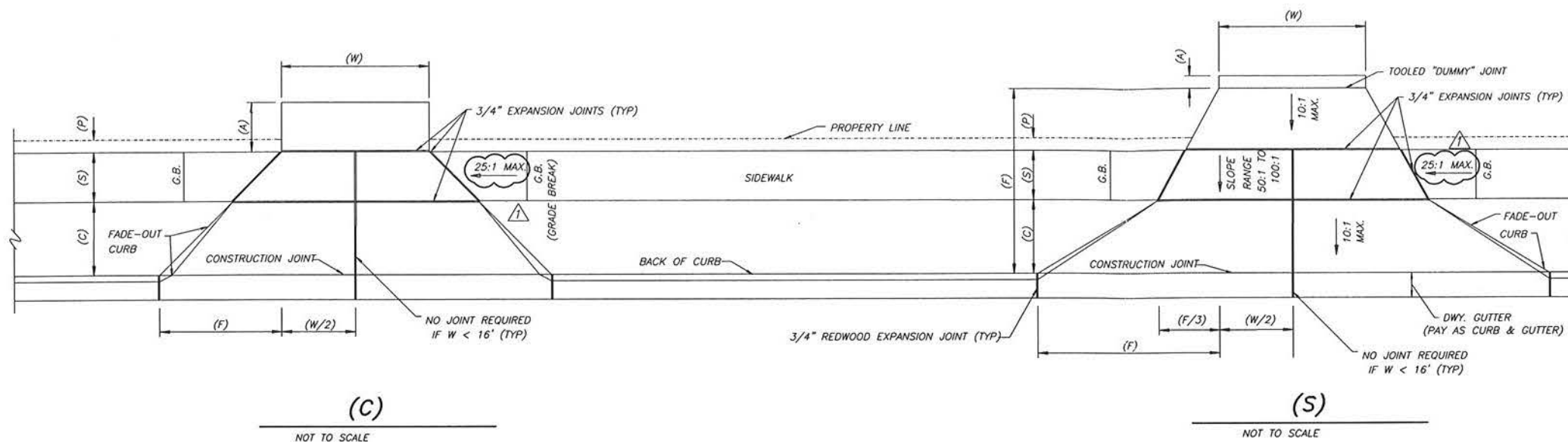
CITY of CORPUS CHRISTI, TEXAS  
Department of Engineering Services

DRIVEWAY DETAILS  
STANDARD DETAILS

1 OF 2

SHEET 1 of 2  
RECORD DRAWING NO.  
CITY PROJECT #

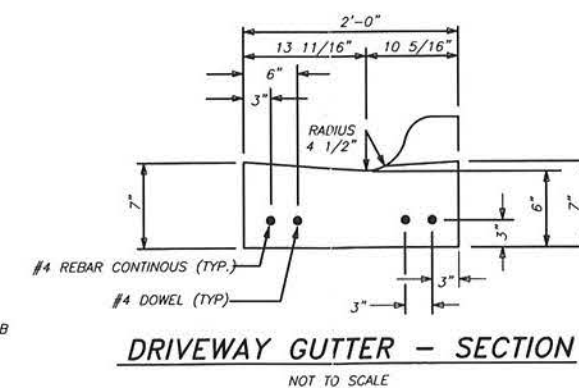
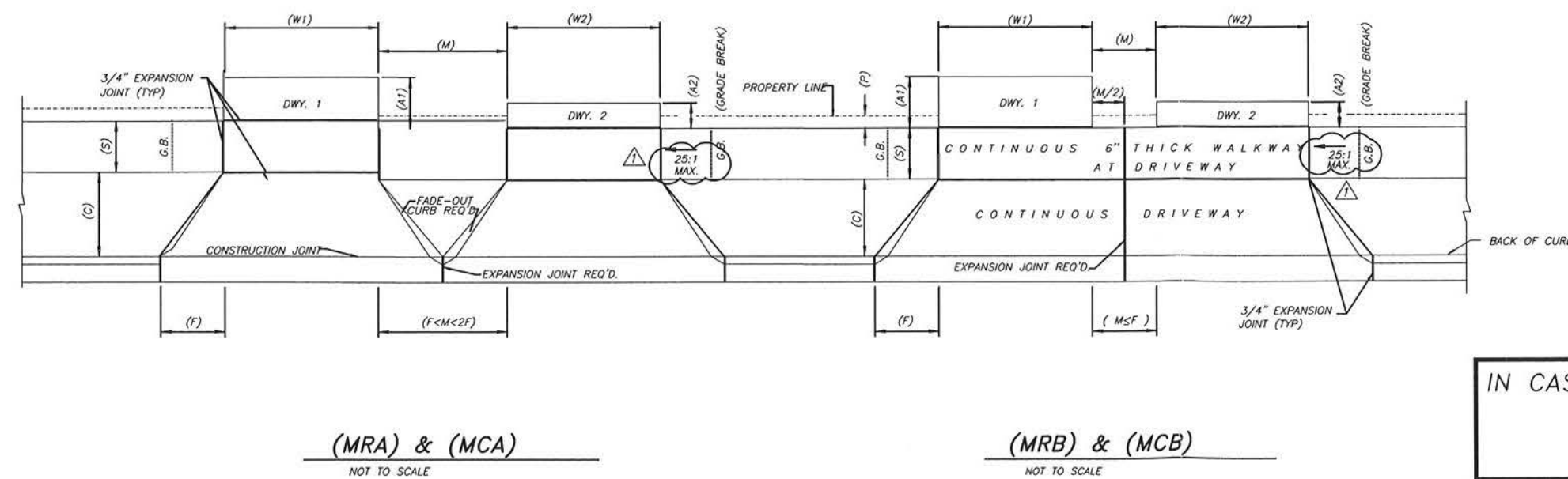
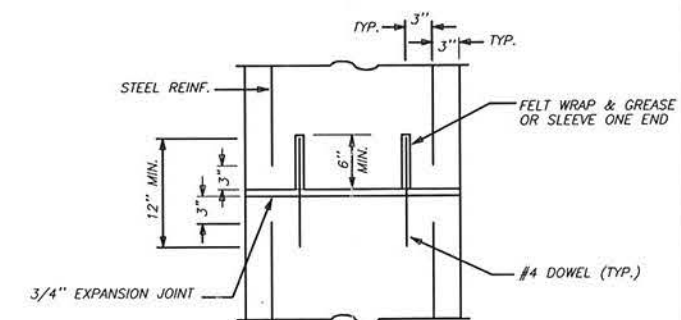
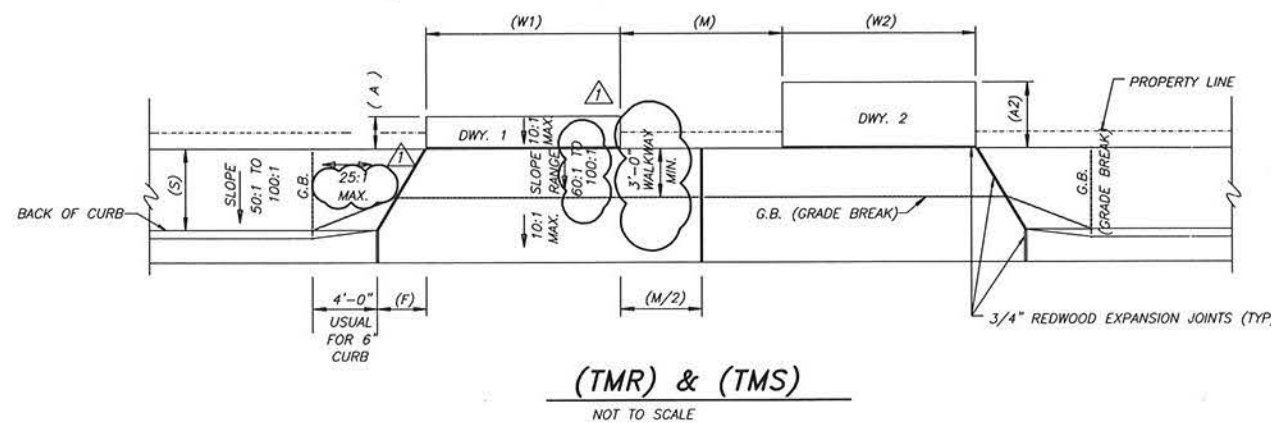
REVISION NO. 12/04 DATE 12/04 BY C.F. DESCRIPTION SLOPE CHANGES ADDENDUM NO. 1



STANDARD DRIVEWAY DIMENSION			
DWY. TYPE	F <sup>a</sup> (FT.)	W <sup>b</sup> (FT.)	M (FT.)
R	5	10-30	
C	10	16-35	
S	15		
MRA	5	10-30	5-10
MRB	5	10-30	<5
MCA	10	16-35	10-20
MCB	10	16-35	<10
TR	3	10-30	
TS	5	<16	
TMR	3	10-30	<6
TMS	5	<16	<10

<sup>a</sup> VALUE OF F MAY BE CHANGED BY ENG.  
<sup>b</sup> RANGE OF NORMALLY ACCEPTABLE VALUES.

LEGEND (DRIVE TYPE)	
R	= RESIDENTIAL DRIVEWAY
C	= COMMERCIAL DRIVEWAY
S	= SPECIAL DRIVEWAY
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MRB	= MULTIPLE RESIDENTIAL DRIVEWAY WITH NO DIVIDER CURB
MCA	= MULTIPLE COMMERCIAL DRIVEWAY WITH DIVIDER CURB
MCB	= MULTIPLE COMMERCIAL DRIVEWAY WITH NO DIVIDER CURB
TR	= TIED RESIDENTIAL DRIVEWAY
TS	= TIED SPECIAL DRIVEWAY
TMR	= TIED MULTIPLE RESIDENTIAL DRIVEWAY
TMS	= TIED MULTIPLE SPECIAL DRIVEWAY



IN CASE OF CONFLICT, DESIGN ENGINEER'S PLANS/SPECS/STDS SHALL TAKE PRECEDENCE

CITY OF CORPUS CHRISTI TEXAS  
 Department of Engineering Services

DRIVEWAY DETAILS	STANDARD DETAILS
SHEET 2 of 2 RECORD DRAWING NO.	
CITY PROJECT #	



**EXHIBIT NO. 6**

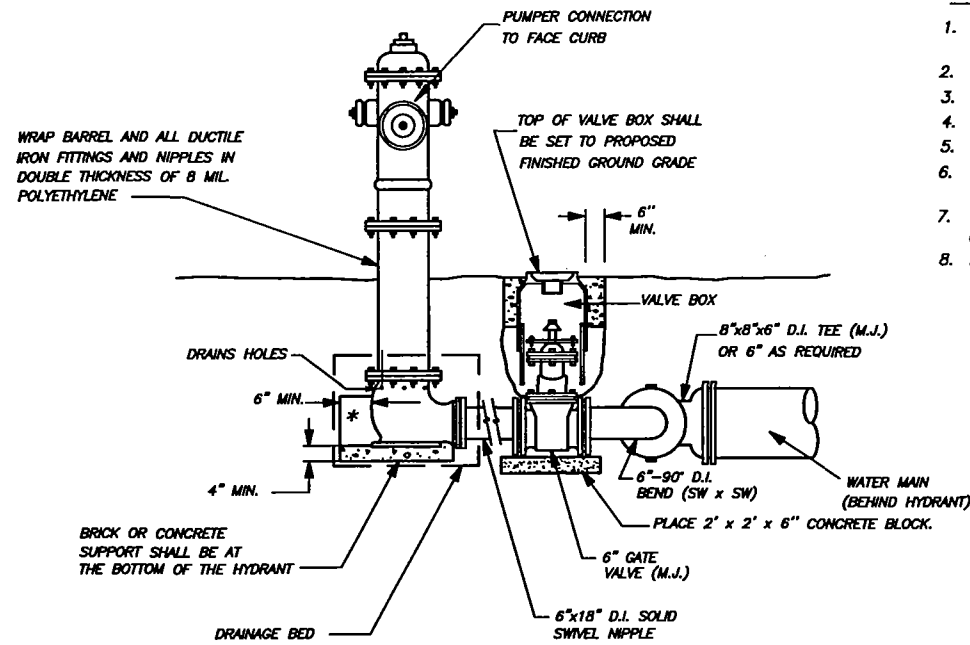
**CITY STANDARD FOR:**

**SIDEWALK & RAMP**  
**DETAILS**

**(Standards will be provided at a later date)**

**EXHIBIT NO. 7**

**CITY STANDARD FOR:**  
**WATER DETAILS**



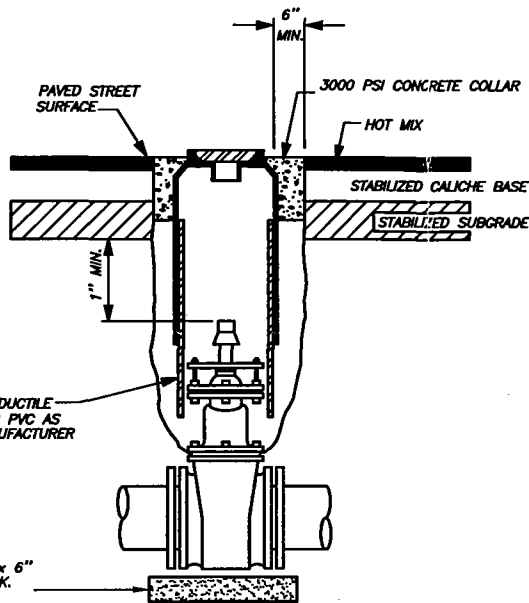
**FIRE HYDRANT ASSEMBLY DETAIL**  
WATER LINE BEHIND CURB

NOT TO SCALE

- \* NOTE :
1. ANYTHING LESS THAN 20' WILL BE DUCTILE IRON LOCKED TO THE VALVE.
  2. ANYTHING MORE THAN 20' SHALL REQUIRE CONCRETE THRUST BLOCK BEHIND HYDRANT AGAINST UNDISTURBED SOIL.

**FIRE HYDRANTS:**

1. DRAINAGE BED SHALL CONSIST OF CRUSHED STONE OR COARSE GRAVEL W/ COARSE SAND, MIN. VOLUME 7 CU. FT., DRAIN BED SHALL EXTEND A MIN. 6" ABOVE DRAIN OUTLET.
2. ALL FIRE HYDRANT FITTINGS SHALL BE LOCKED TOGETHER BY LOCKING RETAINER GLANDS.
3. FIRE HYDRANT TO BE BLOCKED AGAINST FIRM SOIL AS SHOWN.
4. ALL HYDRANTS SHALL BE INSTALLED PLUMB.
5. LARGE NOZZLE FACES ROAD, UNLESS OTHERWISE NOTED. ROTATE BARREL AS REQUIRED.
6. HYDRANT SHOULD NOT BE SET CLOSER THAN 4' TO OBSTRUCTIONS THAT ARE IN LINE WITH NOZZLE.
7. FIRE HYDRANT SHALL BE SET TO MANUFACTURER'S BURY LINE AT PROPOSED/EXISTING GRADE PLUS 1".
8. NO TAPS ARE TO BE MADE ON FIRE HYDRANT LEAD.

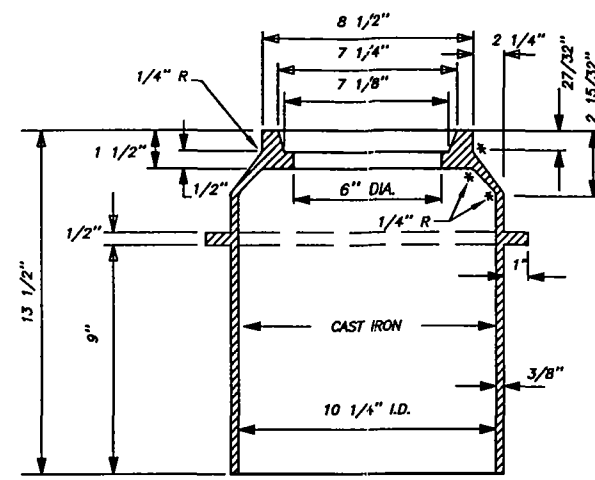


**VALVE BOX DETAIL**  
PAVEMENT

NOT TO SCALE

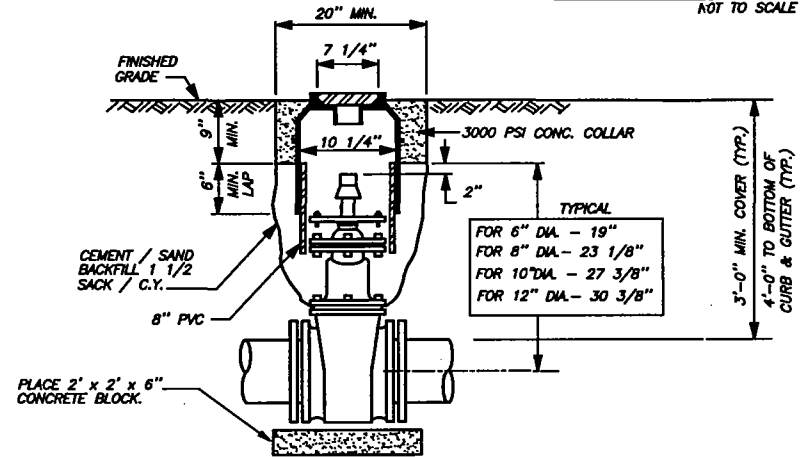
RISER SHALL BE DUCTILE OR CAST IRON OR PVC AS PROVIDED BY MANUFACTURER

PLACE 2' x 2' x 6" CONCRETE BLOCK.



**EXTENSION DETAIL**

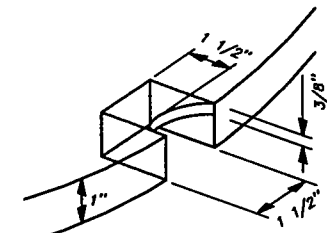
NOT TO SCALE



**VALVE BOX DETAIL**  
NATURAL GROUND

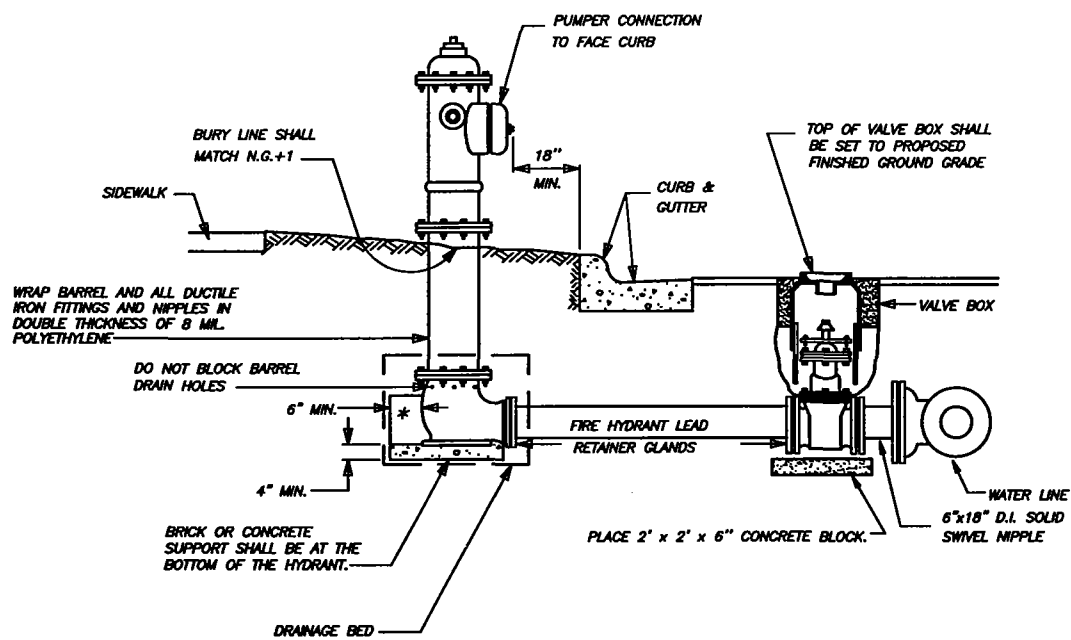
NOT TO SCALE

ALL VALVES SHALL BE HOUSED IN APPROVED VALVE BOXES



**PICK NOTCH**

NOT TO SCALE

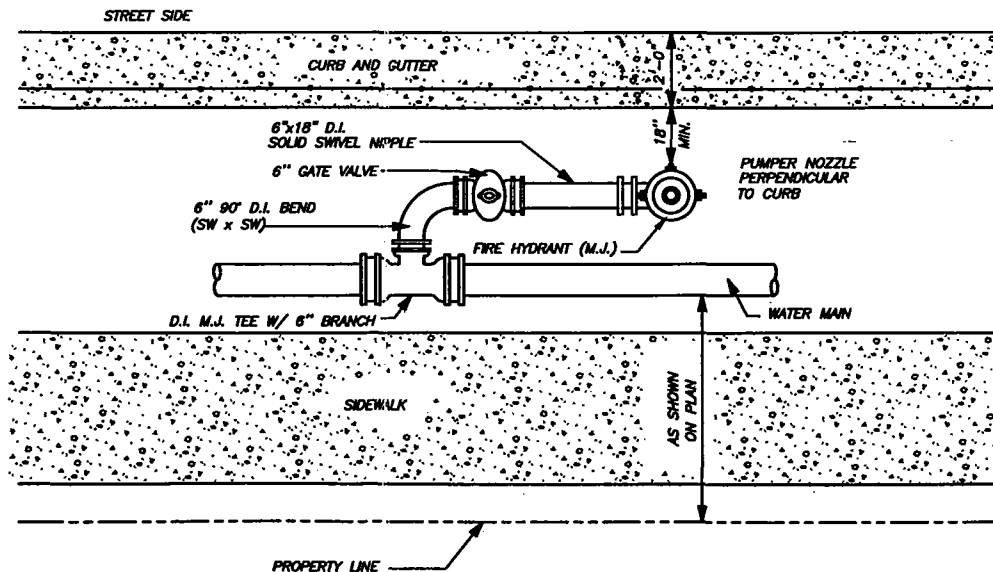


**FIRE HYDRANT ASSEMBLY DETAIL**

WATER LINE IN STREET

NOT TO SCALE

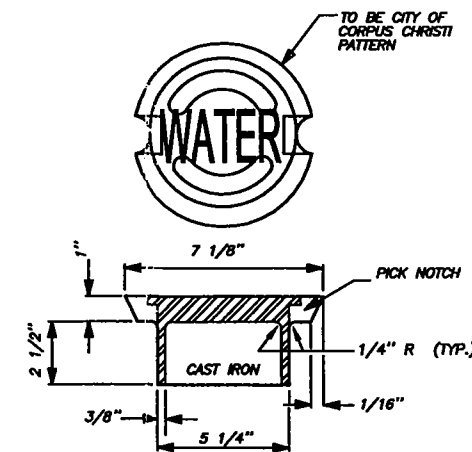
- \* NOTE :
1. ANYTHING LESS THAN 20' WILL BE DUCTILE IRON LOCKED TO THE VALVE.
  2. ANYTHING MORE THAN 20' SHALL REQUIRE CONCRETE THRUST BLOCK BEHIND HYDRANT AGAINST UNDISTURBED SOIL.



**FIRE HYDRANT ASSEMBLY DETAIL**

WATER LINE BEHIND CURB

NOT TO SCALE



**LID DETAIL**

NOT TO SCALE

**CITY OF CORPUS CHRISTI TEXAS**  
Department of Engineering Services

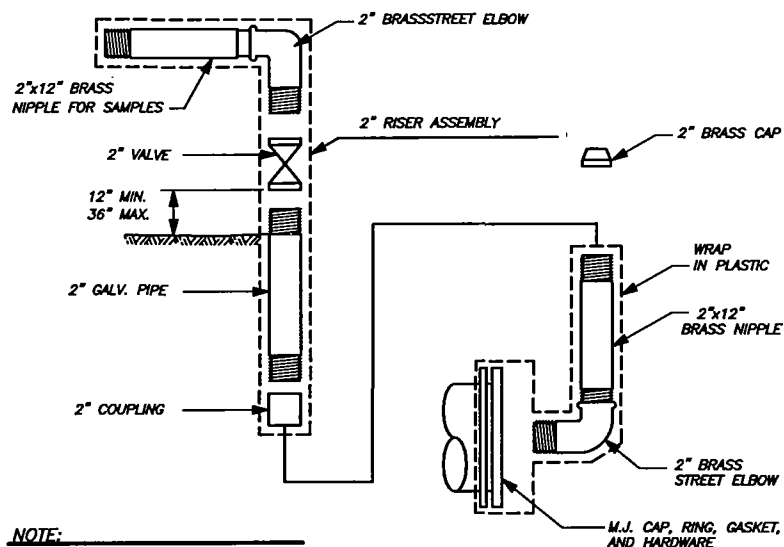
**STANDARD WATER DETAILS**  
FIRE HYDRANT, VALVE BOX AND LID  
1 OF 5

REVISION NO. DATE BY DESCRIPTION

SHEET      of       
RECORD DRAWING NO.       
CITY PROJECT #     

**EXHIBIT 7**  
Sheet 1 of 5

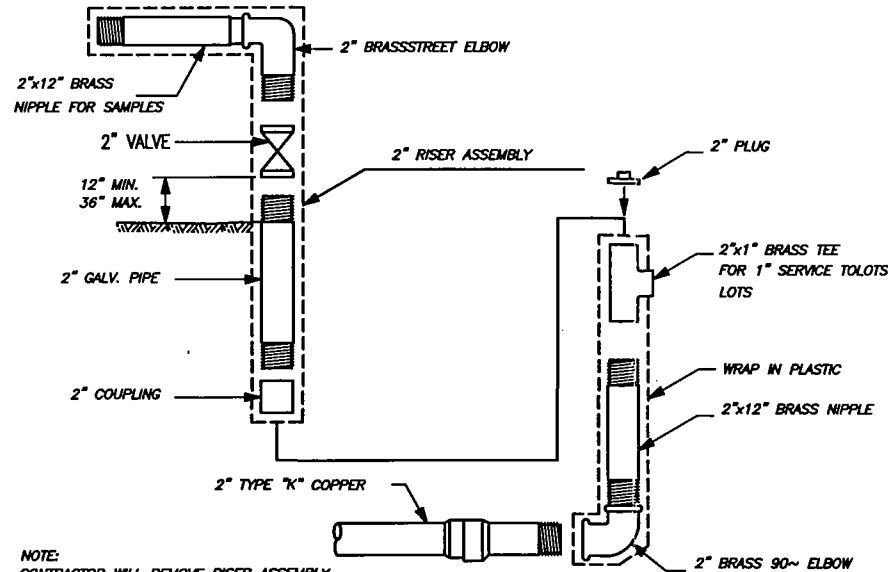




**NOTE:**  
AFTER BACTERIOLOGICAL SAMPLE PASSES TEST, CONTRACTOR WILL REMOVE RISER ASSEMBLY AND INSTALL 2" BRASS CAP

**DETAIL "B"**  
**TEST RISER ASSEMBLY**  
NOT TO SCALE

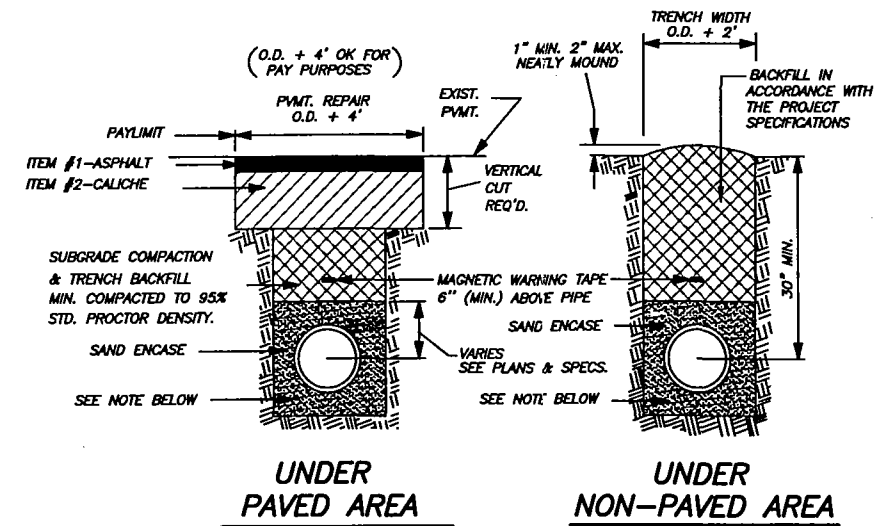
FURNISHED AND INSTALLED BY CONTRACTOR



**NOTE:**  
CONTRACTOR WILL REMOVE RISER ASSEMBLY AND INSTALL 2" BRASS PLUG ON 2"x1" BRASS TEE AFTER SAMPLE PASSES

**DETAIL "C"**  
**TEST RISER ASSEMBLY**  
NOT TO SCALE

FURNISHED AND INSTALLED BY CONTRACTOR



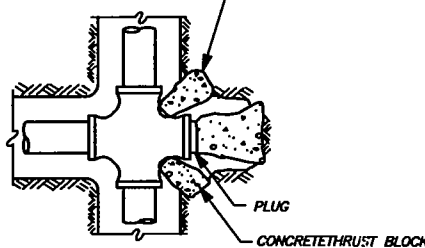
PAVEMENT REPAIR SHALL BE CLASS I UNLESS OTHERWISE INDICATED.

THICKNESS REQUIRED FOR P.V.M.T. REPAIR			
ITEM	CLASS I	CLASS II	CLASS III
1	1 1/2"	2"	3"
2	8"	10"	12"

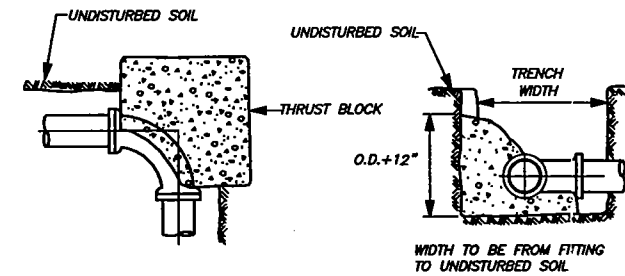
**NOTE:**  
PIPE SMALLER THAN 16" TO BE 8" SAND ENCASED 16" & ABOVE TO BE 12" SAND ENCASED.

**PAVEMENT REPAIR & BACKFILL**  
NOT TO SCALE

TOTAL AREA OF BLOCKS EQUAL AREA REQUIRED FOR TEE (SEE TABLE FOR MINIMUM THRUST BLOCK AREA)



**CROSS WITH PLUG**  
NOT TO SCALE

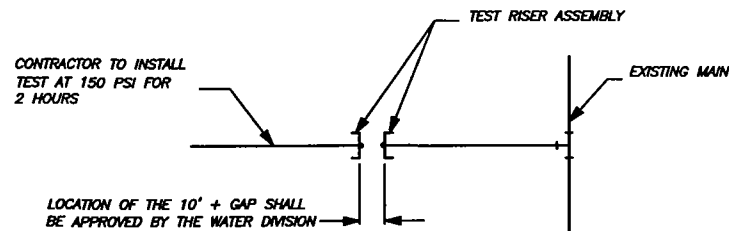


**CONCRETE SUPPORT BEHIND FITTING**  
NOT TO SCALE

MINIMUM THRUST BLOCK AREA REQUIRED					
PIPE SIZE	TEES & PLUGS	90° BEND	45° BEND	22.5° BEND	11.25° BEND
6"	2 SQ. FT.	3 SQ. FT.	2 SQ. FT.	1 SQ. FT.	1 SQ. FT.
8"	4 SQ. FT.	5 SQ. FT.	3 SQ. FT.	1 SQ. FT.	1 SQ. FT.
10"	6 SQ. FT.	8 SQ. FT.	5 SQ. FT.	2 SQ. FT.	1 SQ. FT.
12"	8 SQ. FT.	12 SQ. FT.	6 SQ. FT.	3 SQ. FT.	2 SQ. FT.
16"	15 SQ. FT.	21 SQ. FT.	12 SQ. FT.	6 SQ. FT.	3 SQ. FT.
18"	19 SQ. FT.	27 SQ. FT.	15 SQ. FT.	7 SQ. FT.	4 SQ. FT.
20"	24 SQ. FT.	33 SQ. FT.	18 SQ. FT.	9 SQ. FT.	5 SQ. FT.
24"	34 SQ. FT.	48 SQ. FT.	26 SQ. FT.	13 SQ. FT.	7 SQ. FT.

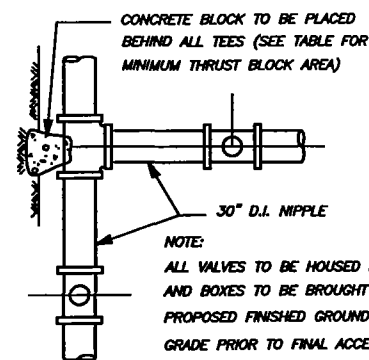
- NOTE:**
- THRUST BLOCKS SHALL BE POURED AGAINST UNDISTURBED SOIL.
  - WHERE TRENCH WALL HAS BEEN DISTURBED, EXCAVATE ALL LOOSE MATERIAL AND EXTEND THRUST BLOCK TO UNDISTURBED SOIL.
  - ON TEES AND BENDS, EXTEND THRUST BLOCK FULL LENGTH.
  - NO CONCRETE SHALL BE POURED OVER BOLTS OR ON TOP OF FITTINGS.
  - BACKFILL SHALL CONSIST ENTIRELY OF CLEAN SOIL FREE OF ROCK FRAGMENTS. ANY MUCK ENCOUNTERED SHALL BE REPLACED WITH ACCEPTABLE BACKFILL.
  - ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.
  - NO SEPARATE PAYMENT.

**EXHIBIT 7**  
Sheet 3 of 5



**DETAIL "A"**  
**TEST RISER ASSEMBLY CONNECTION**  
NOT TO SCALE

- HYDROSTATIC TEST:** WATER FOR FILLING THE NEW WATER LINE AND PERFORMING TESTS WILL BE FURNISHED TO THE CONTRACTOR BY THE CITY OF CORPUS CHRISTI THROUGH A STANDARD WATER CONSTRUCTION METER CONNECTION. STANDARD WATER CONSTRUCTION METER AND GAUGE WILL BE SUPPLIED BY THE CITY AFTER THE CONTRACTOR HAS PAID ALL APPLICABLE FEES FOR THE WATER CONSTRUCTION METER. THE TEST PUMP WITH APPROPRIATE CONNECTION POINTS AS APPROVED BY THE WATER SUPERINTENDENT FOR THE INSTALLATION OF METER AND GAUGE SHALL BE FURNISHED BY THE CONTRACTOR. THE METER SHALL BE DIRECTLY CONNECTED TO THE MAIN OR PIPE BEING TESTED BY THE USE OF COPPER TUBING OR AN APPROVED REINFORCED HOSE. THE METER SHALL BE PROTECTED AGAINST EXTREME PRESSURES BY THE USE OF A ONE (1") INCH SAFETY RELIEF VALVE SET AT THE TEST PRESSURE PLUS TEN POUNDS PER SQUARE INCH AND FURNISHED BY THE CITY (48 HOURS NOTIFICATION).
- BACTERIOLOGICAL TEST:** CONTRACTOR SHALL FURNISH AND INSTALL TEST RISER ASSEMBLY. AFTER BACTERIOLOGICAL SAMPLE PASSES TEST, CONTRACTOR SHALL REMOVE TEST RISER ASSEMBLY AND TIE NEW SYSTEM TO EXISTING UNDER THE SUPERVISION OF THE WATER DIVISION INSPECTOR. CONTRACTOR SHALL FURNISH ALL MATERIALS, LABOR AND EQUIPMENT THAT IS REQUIRED TO MAKE TIE / CONNECTION. CONTRACTOR WILL SCHEDULE & COORDINATE WITH WATER DIVISION INSPECTOR ON DATE & TIME OF TIE-IN. (24 HOURS NOTIFICATION)
- CONTRACTOR SHALL FURNISH AND INSTALL TAPPING SLEEVE OR SADDLE AND TAPPING GATE VALVE AND VALVE BOX COMPLETE. CITY TO MAKE TAP (72 HOURS NOTIFICATION)



**TYPICAL PLAN OF VALVE & THRUST BLOCK LOCATIONS**  
NOT TO SCALE

NOT TO SCALE

**CITY OF CORPUS CHRISTI TEXAS**  
Department of Engineering Services

**STANDARD WATER DETAILS**  
ADJUSTMENTS, CASING DETAILS, FLDG VALVE, CONNECTIONS & TYP. VALVE LAYOUT

REVISION NO. DATE DESCRIPTION BY

SHEET . of .  
RECORD DRAWING NO.

CITY PROJECT #

**WATER DISTRIBUTION SYSTEM GENERAL NOTES**

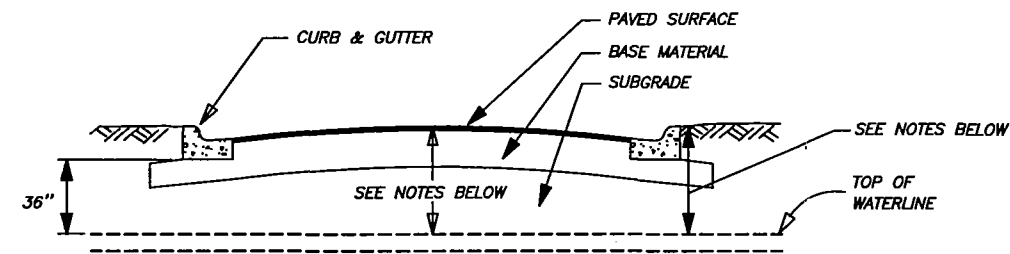
1. PROPOSED WATER DISTRIBUTION SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH CITY OF CORPUS CHRISTI WATER DIVISION DISTRIBUTION SYSTEM STANDARDS.
2. THE CITY RESERVES THE RIGHT TO ACCEPT THE SYSTEM FOR OPERATION AT ANY TIME, BUT THE DATE OF OFFICIAL ACCEPTANCE OF THE SYSTEM WILL BE UPON COMPLETION OF THE PROJECT AND SATISFACTORY TEST RESULTS.
3. THE EXISTING SYSTEM SHALL REMAIN IN SERVICE UNTIL THE PROPOSED SYSTEM IS PUT INTO SERVICE. THE CONTRACTOR SHALL PROTECT THE EXISTING SYSTEM UNTIL IT IS TAKEN OUT OF SERVICE.
4. THE CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT REQUIRED TO INSTALL THE PROPOSED SYSTEM.
5. TESTING OF LINES (STERILIZATION AND PRESSURED) SHALL BE DONE BY THE CONTRACTOR UNDER THE SUPERVISION OF THE WATER DIVISION. WATER FOR FILLING THE NEW WATER LINE AND PERFORMING TESTS WILL BE FURNISHED TO THE CONTRACTOR BY THE CITY OF CORPUS CHRISTI THROUGH A STANDARD WATER CONSTRUCTION METER CONNECTION. STANDARD WATER CONSTRUCTION METER AND GAUGE WILL BE SUPPLIED BY THE CITY AFTER THE CONTRACTOR HAS PAID ALL APPLICABLE FEES FOR THE WATER CONSTRUCTION METER. ALL WATER DISCHARGE MUST BE DECHLORINATED IN ACCORDANCE WITH TNRCC & NPDES REGULATIONS.
6. THE CONTRACTOR SHALL RECOVER AND STOCK-PILE AT A LOCATION DESIGNATED BY THE WATER DIVISION INSPECTOR, ALL FIRE HYDRANTS, VALVES, AND FITTINGS THAT ARE TAKEN OUT OF SERVICE. THESE MATERIALS MAY BE SALVAGED BY THE CITY. HOWEVER, ALL ITEMS NOT CLAIMED BY THE CITY PRIOR TO THE FINAL INSPECTION SHALL BE DISPOSED OF BY THE CONTRACTOR.
7. THE CONTRACTOR SHALL BEAR ALL COST ASSOCIATED WITH WATERLINE REPAIRS (WHICH RESULT FROM DAMAGE CAUSED BY THE CONTRACTOR) UPON COMPLETION OF PROJECTS. ALL WATER LINES SHALL BE FREE OF ALL PATCHES AND SPLICES.
8. ALL PHYSICAL TIES OF THE PROPOSED SYSTEM INTO THE EXISTING WATERLINE SHALL BE RECONNECTED AND BE MADE UNDER SUPERVISION OF THE WATER DIVISION INSPECTOR. THE CONTRACTOR SHALL FURNISH ALL MATERIALS AND ALL EQUIPMENT THAT IS REQUIRED TO MAKE TIE-INS. CITY WATER DIVISION CREWS WILL MAKE TAPS ON CITY MAINS ARRANGED THROUGH WATER DIVISION INSPECTOR (72 HOUR NOTIFICATION)
9. ALL EXISTING SERVICE CONNECTIONS TIED ONTO THE EXISTING WATERLINE SHALL BE RECONNECTED BY THE CONTRACTOR, INCLUDING RELOCATING EXISTING WATER METERS. IT SHALL BE THE CONTRACTOR'S SOLE RESPONSIBILITY TO NOTIFY AND COORDINATE WITH THE WATER DIVISION INSPECTOR SAID RECONNECTIONS / RELOCATIONS IN ADVANCE OF CONSTRUCTION TO AVOID DELAYS. (NO SEPARATE COSTS)
10. MINOR LENGTH OF DUCTILE IRON PIPE ADJACENT TO FITTINGS MAY BE REQUIRED AS DIRECTED BY THE WATER DIVISION INSPECTOR BASED ON CONDITIONS ENCOUNTERED IN THE FIELD. THE CONTRACTOR SHALL USE D.I.P. AS DIRECTED AND SHALL BE PAID AT THE UNIT PRICE BID FOR THE APPROPRIATE SIZE WATERLINE. A MINOR LENGTH IS DEFINED AS A SINGLE LOCATION REQUIRING THE USE OF TWO JOINTS OR LESS.
11. MINOR ADJUSTMENTS IN THE LOCATIONS OF FITTINGS, VALVES, FIRE HYDRANTS, ETC. CAN BE ANTICIPATED. THE CONTRACTOR SHALL MAKE SAID MINOR ADJUSTMENTS AS DIRECTED BY THE ENGINEER AND/OR WATER DIVISION INSPECTOR AT NO INCREASE OF CONTRACT PRICE. WATER DIVISION WILL BE NOTIFIED PRIOR TO ALL CHANGES.
12. ALL NIPPLES BETWEEN FITTINGS AND VALVES ALONG MAINS SHALL BE DUCTILE IRON.
13. ALL DUCTILE IRON PIPES, VALVES, AND FITTINGS SHALL BE WRAPPED WITH (2) THICKNESSES OF 8 MIL POLYETHYLENE AND SHALL BE RESTRAINED WITH "MEGALUG", MECHANICAL JOINT RESTRAINT OR ENGINEER APPROVED EQUAL AT ALL FITTINGS.  
CONCRETE THRUST BLOCKS SHALL BE PLACED BEHIND ALL FITTINGS EXCEPT WHERE LOCKING OR SWIVEL FITTINGS ARE UTILIZED, UNLESS OTHERWISE SPECIFIED BY THE WATER DIVISION ENGINEER.
15. ALL OFFSETS ARE TO BE DUCTILE IRON PIPE ASSEMBLIES LOCKED TOGETHER BY RETAINER GLANDS. DUCTILE IRON BENDS SHALL BE UTILIZED FOR ANY CHANGES IN ALIGNMENT OR GRADE.
16. IF A WATER LINE IS TO BE ABANDONED, THE CONTRACTOR WILL FILL WITH CONTROLLED LOW STRENGTH MATERIAL, "DARAFILL" BRAND OR ENGINEER APPROVED EQUAL, VALVES WILL BE REMOVED OR FILLED AS REQUIRED BY WATER DIVISION INSPECTOR.
17. CONTRACTOR SHALL COORDINATE WITH WATER DIVISION INSPECTOR AND NOTIFY ALL AFFECTED CUSTOMERS 24 HOURS PRIOR TO KILLOUT OF EXISTING WATER SYSTEM.
18. WATER DISTRIBUTION SYSTEM STANDARDS CALL FOR MAXIMUM 48" COVER ON WATERLINES. WHEN DEPTHS EXCEED 48" COVER TO AVOID OBSTRUCTION, THE USES OF BENDS COULD BE REQUIRED.
19. CONTRACTOR SHALL KEEP ALL EXISTING VALVES ACCESSIBLE DURING ALL PHASES OF CONSTRUCTION.
20. ALL NEW WATER MAINS SHALL BE INSTALLED SO THAT PIPE IDENTIFICATION MARKINGS ARE LOCATED ON THE TOP OF THE PIPE.
21. ALL SERVICE LINES UNDER PAVEMENT SHALL BE ONE INCH, INSIDE DIAMETER, MINIMUM.

**SEPARATION OF WATER AND SANITARY SEWER LINES**

1. THE SEPARATION OF WATER AND SANITARY SEWER LINES AND THE MATERIAL USED SHALL BE IN ACCORDANCE WITH THE "RULES & REGULATIONS FOR PUBLIC WATER SYSTEMS" OF TEXAS NATURAL RESOURCE CONSERVATION COMMISSION AND THE CITY WATER DETAILS.
2. WHENEVER WATER & SANITARY SEWER LINES CROSS, ONE JOINT OF C900 PVC WATER LINE SHALL BE CENTERED OVER THE SANITARY SEWER LINE IN ADDITION TO ANY REQUIREMENTS AS DICTATED BY ITEM 1 ABOVE.

**NOTES:**

CONTRACTOR MAY BE REQUIRED BY THE WATER DIVISION INSPECTOR TO INSTALL CENTERED JOINTS OF DUCTILE IRON PIPE AT WATERLINE CROSSINGS OF EXISTING HAZARDOUS PRODUCT FLOWLINES.



**WATERLINE MINIMUM COVER REQUIREMENTS**

**NOTES:**

1. ALL MAINS IN THE STREET SHALL HAVE A MINIMUM OF 36" OF COVER AND BE 12" MINIMUM BELOW SUBGRADE AT ALL POINTS AND HAVE VALVE CLEARANCES IN ACCORDANCE WITH THE VALVE DETAIL.
2. ALL TRANSMISSION MAINS (12" DIAMETER & ABOVE) IN THE STREET SHALL HAVE 48" OF COVER AT ALL POINTS.
3. ALL MAINS NOT UNDER THE STREET SHALL HAVE A MINIMUM OF 36" OF COVER AT ALL POINTS.

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CITY OF CORPUS CHRISTI  
TEXAS  
Department of Engineering Services

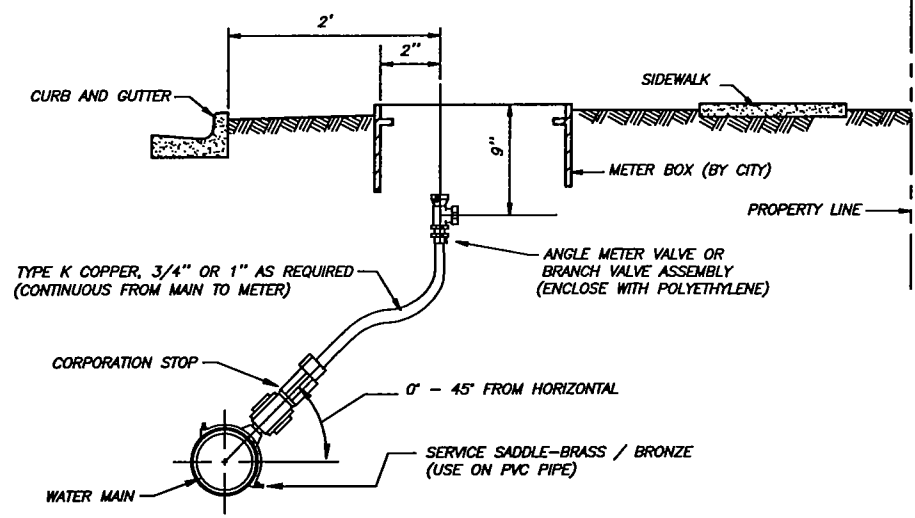


STANDARD WATER DETAILS  
WATER DISTRIBUTION  
GENERAL NOTES 4 OF 5

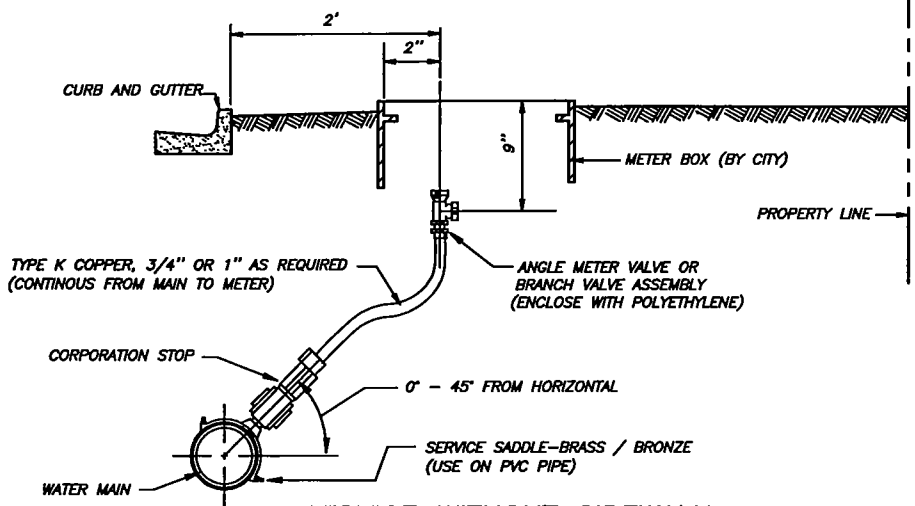
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EXHIBIT 7  
Sheet 4 of 5

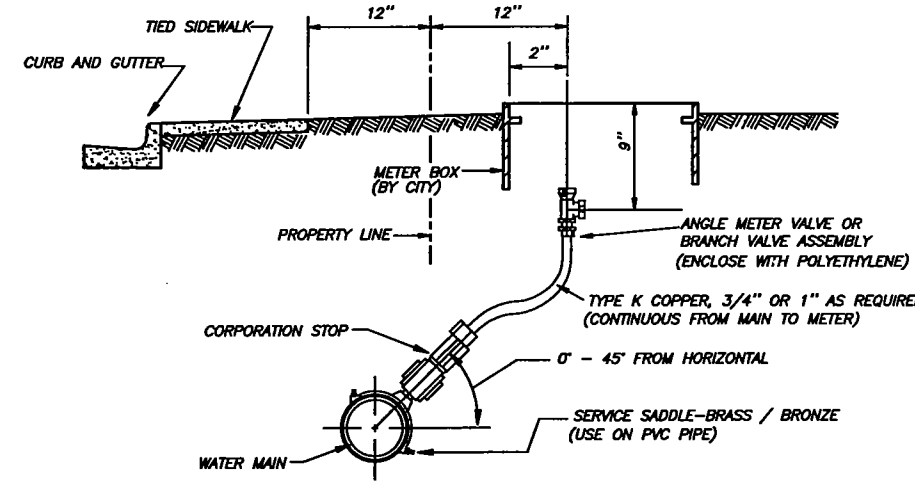
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CITY PROJECT # . . . .



**SERVICE WITH SIDEWALK**  
NOT TO SCALE

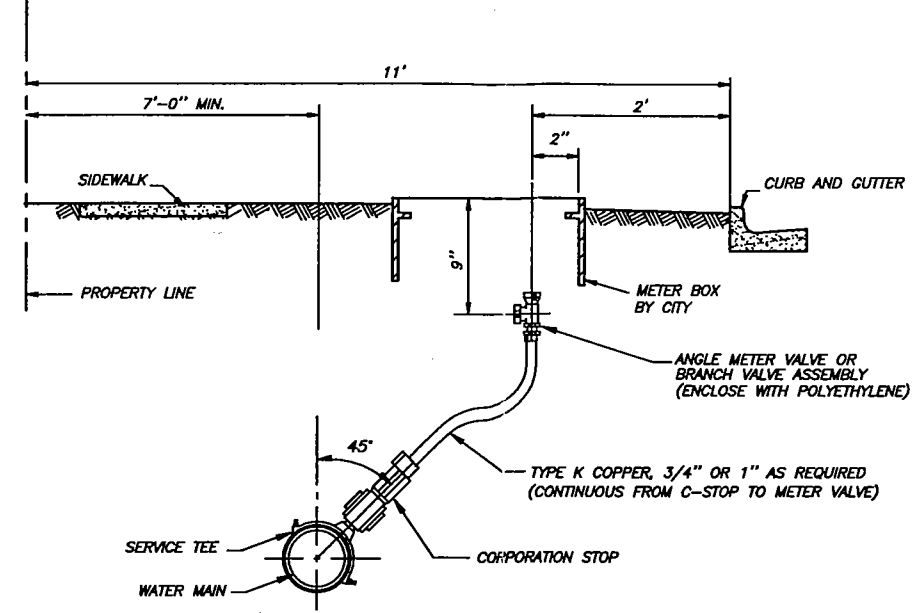


**SERVICE WITHOUT SIDEWALK**  
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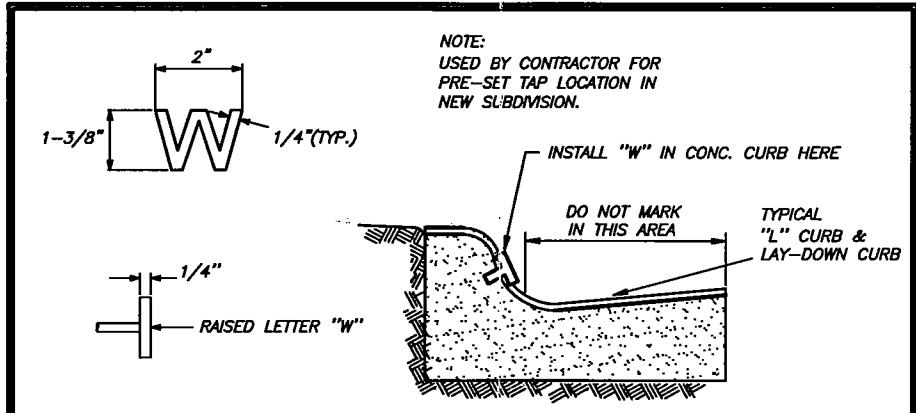


**SERVICE WITH SIDEWALK TIED TO CURB**  
NOT TO SCALE

- NOTES:**
1. IF THERE IS LESS THAN 2' FROM BACK OF SIDEWALK TO PROPERTY LINE, THE METER BOX SHALL BE PLACED 1' BEHIND PROPERTY LINE AND UTILITY EASEMENT WILL BE REQUIRED.
  2. IF THERE IS MORE THAN 2' FROM BACK OF SIDEWALK TO PROPERTY LINE, THE METER BOX SHALL BE PLACED BEHIND SIDEWALK.
  3. THE WATER DIVISION WILL APPROVE ANY PLACEMENT OF A SERVICE LINE IN A TIED-SIDEWALK SITUATION.



**TYPICAL CUL-DE-SAC SERVICE**  
NOT TO SCALE



**BRASS "W" DETAIL**  
**MARKER LOCATION**  
**PRE-SET SERVICE LINE MARKER DETAILS**  
NOT TO SCALE

**SERVICE LINE MATERIALS**

**SERVICE CLAMPS**  
FOR 3/4", 1", 1 1/2" I.P. THREAD TAPS FOR 6" MAINS; 2" I.P. THREAD CLAMP TAP CONNECTION ALLOWED FOR 8" AND LARGER MAINS.

**CORPORATION STOPS**  
3/4", 1", 1 1/2", AND 2" REQUIRED WITH I.P. THREAD INLET BY COPPER COMPRESSION OUTLET WITH CLAMP - CORPORATION STOP REQUIRED AT ALL SERVICE TAPS.

**TYPE K COPPER**  
REQUIRED FOR ALL SERVICE LINES BETWEEN MAIN TO METER - SIZES REQUIRED 3/4", 1", 1 1/2", AND 2" (NO SPLICES ALLOWED)

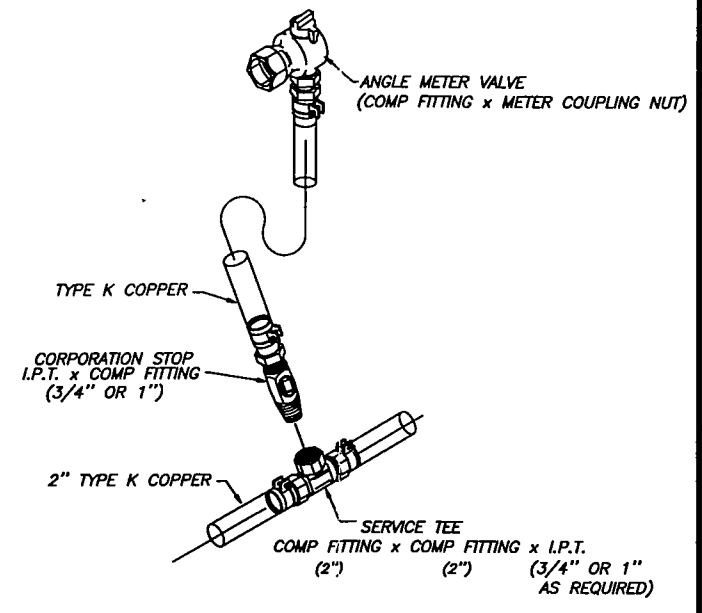
**ANGLE METER STOP**  
REQUIRED AT ALL METERS - SIZES 3/4" & 1" - INSTALL 3/4" UNLESS DIRECTED OTHERWISE - COPPER COMPRESSION W/ CLAMP INLET BY METER COUPLING NUT OUTLET.

**METER (BY OTHERS)**  
**METER ADAPTER AND CHECK VALVE (BY OTHERS)**  
REQUIRED AT ALL METERS - SIZES 3/4" & 1" - INSTALL 3/4" UNLESS DIRECTED OTHERWISE - METER NUT INLET BY 3/4" MALE I.P. OUTLET.

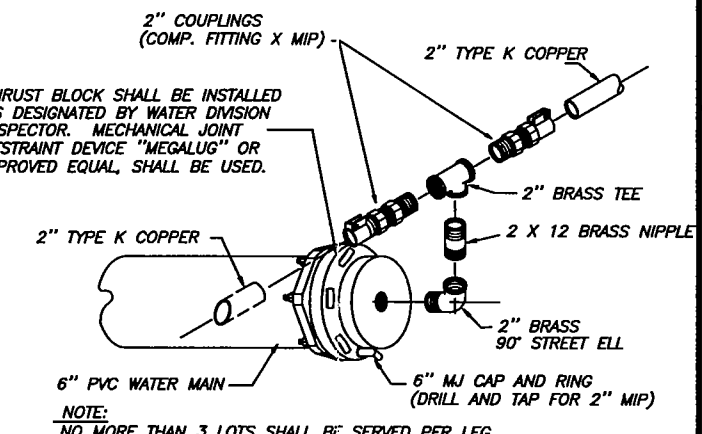
**ADAPTER COUPLING (BY OTHERS)**  
REQUIRED AT ALL METERS - 3/4" & 1" - FEMALE I.P. BY PVC COMPRESSION.

**METER BOX**  
CAST IRON W/ HOT TAR DIP SHALL BE PROVIDED BY THE CONTRACTOR FOR 3/4" METER SETTINGS, IF EXISTING STRUCTURE DOES NOT HAVE ONE. BOXES FOR LARGER (1" & UP) METER SETTINGS SHALL BE FURNISHED BY THE CITY.

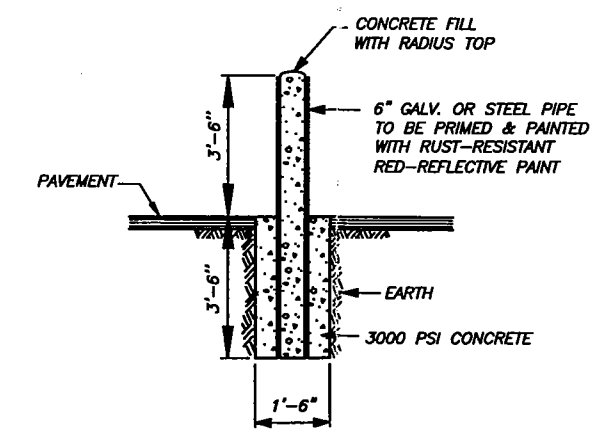
**BRASS FITTINGS**  
BRASS FITTINGS SHALL COMPLY WITH A.W.W.A. C800-85 AND BE WRAPPED IN POLYETHYLENE.



**TYPICAL CONNECTION DETAIL**  
NOT TO SCALE



**TYPICAL CONNECTION DETAIL**  
NOT TO SCALE



NOTE: DO NOT PLACE BOLLARD IN FRONT OF HOSE OUTLETS

**BOLLARD DETAIL**  
NOT TO SCALE

**EXHIBIT 7**  
Sheet 5 of 5

CITY of CORPUS CHRISTI  
TEXAS  
Department of Engineering Services

STANDARD WATER DETAILS  
MAIN TO SERVICE DETAILS  
AND OTHERS

REVISION NO.	DATE	BY	DESCRIPTION

SHEET . of .  
RECORD DRAWING NO.  
CITY PROJECT #

**EXHIBIT NO. 8**

**CITY STANDARD FOR:**  
**SANITARY SEWER**  
**DETAILS**

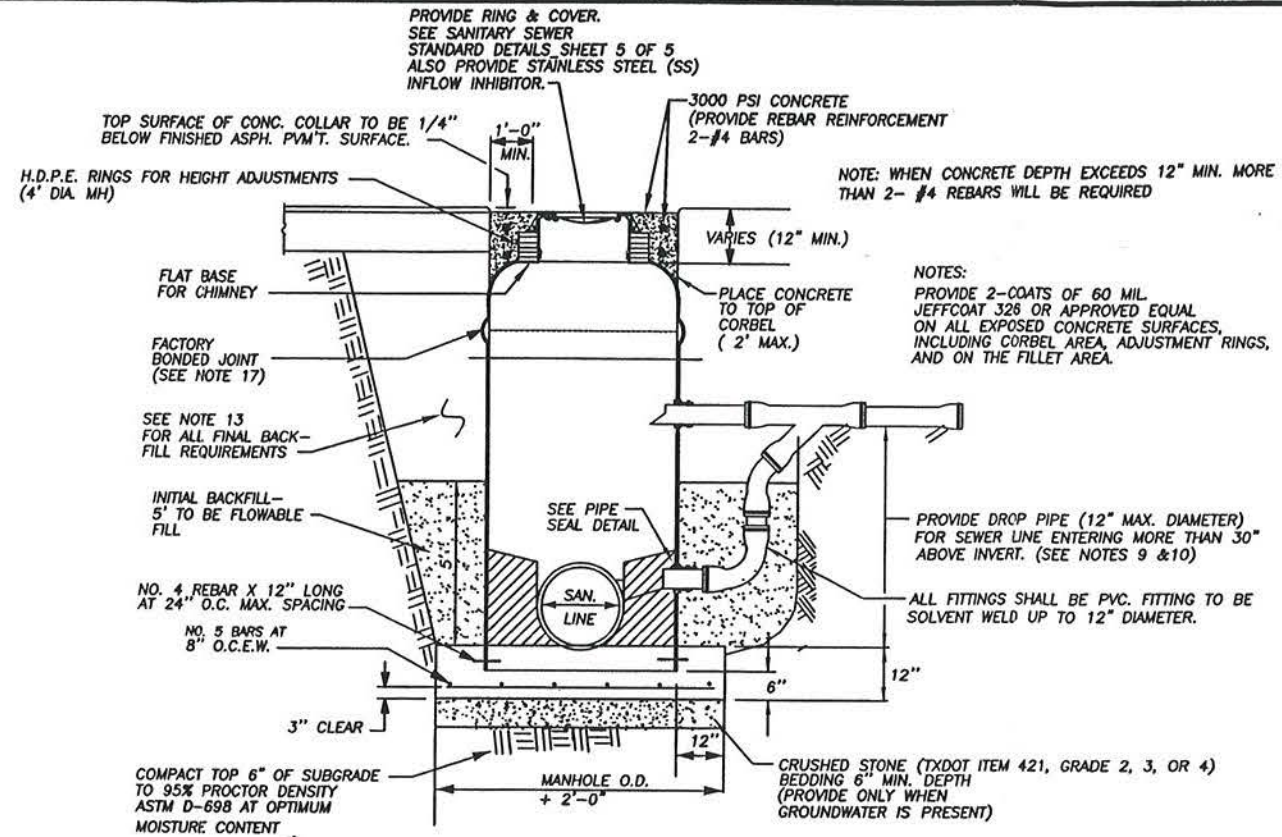


# NEW FIBERGLASS MANHOLE CONSTRUCTION:

1. THE CONTRACTOR SHALL VISIT THE SITE OF THE WORK AND EXAMINE LOCAL CONDITIONS TO BE ENCOUNTERED, IMPROVEMENTS TO BE PROTECTED, PERMITS AND FEES REQUIRED, AND OTHER RESEARCH NECESSARY TO ASSURE CONTRACTOR UNDERSTANDS THE PROJECT THOROUGHLY AND IS FULLY AWARE OF ALL CONDITIONS AND CONSTRAINTS WHICH MAY BE ENCOUNTERED DURING THE COURSE OF CONSTRUCTION.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ACQUIRING ANY NECESSARY OFF-SITE LOCATIONS FOR STORAGE OF ALL EQUIPMENT AND MATERIALS REQUIRED FOR THE CONSTRUCTION OF THE PROJECT.
3. ANY SOILS/WATER TABLE INFORMATION INCLUDED IN THE PLANS AND/OR SPECIFICATIONS IS FOR REFERENCE ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PERFORMING ANY INVESTIGATION AND/OR RESEARCH NECESSARY TO IDENTIFY EXISTING CONDITIONS THAT MAY IMPACT OR INFLUENCE PROPOSED CONSTRUCTION.
4. THE PRECONSTRUCTION EXPLORATORY EXCAVATION REPORT (IF REQUIRED) SHALL BE COMPLETED PRIOR TO ANY CONSTRUCTION, TO VERIFY THE LOCATION OF EXISTING CONDITIONS OF UNDERGROUND UTILITIES AND/OR SUBSTRUCTURES.
5. CONTRACTOR SHALL CONDUCT EXCAVATION AND BACKFILL OPERATIONS IN SUCH A MANNER AS TO CAUSE NO DAMAGE TO ANY EXISTING UTILITY, NOR CREATE ANY PERIL FOR THE PUBLIC DURING AND AFTER CONSTRUCTION. UTILITIES FOUND IN CONDITION OTHER THAN AS SHOWN ON THE DRAWINGS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER. NOTE THAT ALL DAMAGE TO UTILITIES SHALL BE RECONSTRUCTED TO THE SATISFACTION OF THE CITY AND ENGINEER AT CONTRACTOR'S EXPENSE.
6. PRIOR TO ANY MANHOLE EXCAVATION OR OPENING OF MANHOLE COVERS IN THE ROAD WAY PROPER BARRICADING AND REROUTING SIGNS SHALL BE PLACED TO DIVERT THE TRAFFIC AND PEDESTRIANS IN ACCORDANCE WITH APPROVED TRAFFIC CONTROL PLANS.
7. ALL CUTS THROUGH EXISTING ASPHALT AND/OR CONCRETE PAVING SHALL BE SAW CUT (1" MIN.), UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
8. FOR SEWER LINES ENTERING THE MANHOLE, THE INVERT SHALL BE U-SHAPED CONCRETE GROUT TO A MINIMUM DEPTH OF PIPE O.D.. THE CORNERS SHALL BE FILLETED TO PREVENT SOLIDS DEPOSITION, AS PER T.C.E.Q. REQUIREMENTS.
9. A DROP CONNECTION SHALL BE PROVIDED FOR SEWER LINES ENTERING THE MANHOLE MORE THAN 30" INCHES ABOVE THE MANHOLE INVERT.
10. MANHOLE WALL PENETRATIONS FOR PIPE ABOVE THE FLOWLINE OF THE MANHOLE SHALL BE MADE WITH AN "INSERTA-TEE" RUBBER SLEEVE SEAL OR APPROVED EQUAL.
11. PIPE LAYED ALONG AND THRU THE MANHOLE FLOWLINE MUST HAVE AN APPROVED RUBBER RING SEAL.
12. ALL EXPOSED CONCRETE/GROUT SURFACES WITHIN MANHOLES (INCLUDING MANHOLE INVERT), SHALL BE SEALED WITH 2 COATS OF 60 MILS JEFFCOAT 326 EPOXY OR APPROVED EQUAL.
13. INITIAL BACKFILL AROUND ALL MANHOLES SHALL BE FIVE FOOT MIN. FLOWABLE FILL (100 PSI MINIMUM COMPRESSIVE STRENGTH @ 28 DAYS) AND FINAL BACKFILL TO BE CEMENT STABILIZED SAND AS FILLER (OR AS NOTED OTHERWISE IN THE PLANS).
14. STAINLESS STEEL (S.S.) INFLOW INHIBITORS SHALL BE PROVIDED FOR ALL MANHOLES.
15. TESTING OF THE NEW MANHOLE SHALL BE AS PER CITY STANDARD SPECIFICATIONS.
16. CONTRACTOR MAY SET IN PLACE MANHOLE AFTER MAIN LINE IS INSTALLED PROVIDED AS FOLLOWS: WALL OPENING IS CUT OUT EXACTLY, SO THE RUBBER SEAL FITS WITH NO GAPS. FIBERGLASS IS SET INTO CONCRETE FOUNDATION BASE, AS SHOWN IN THE DETAILS. DO NOT USE FOR LINES ENTERING MANHOLE ABOVE FLOW LINE.
17. ALL MANHOLES SHALL HAVE FACTORY BONDED JOINTS WITH A LABEL CLEARLY INDICATING "FACTORY BONDED".
18. TRENCH BACKFILL/PAVEMENT REPAIRS--SEE TRENCH BACKFILL AND PAVEMENT REPAIR DETAILS (SHEET 3 OF 5)
19. ALL MANHOLE RINGS, COVERS AND APPURTENANCES SHALL BE DESIGNED TO MEET AASHTO-M-306. TRAFFIC SHALL BE RESTRICTED FROM MANHOLE FOR 48 HOURS AFTER PLACEMENT OF CONCRETE COLLAR. SEE SH. 5 OF 5

# TRAFFIC CONTROL - ALL UTILITY WORK

1. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN ALL TRAFFIC CONTROL DEVICES DURING THE COURSE OF CONSTRUCTION.
2. EQUIPMENT AND MATERIALS SHALL NOT BE STORED ON PUBLIC RIGHT-OF-WAY DURING THE COURSE OF CONSTRUCTION. ANY MATERIAL AND EQUIPMENT APPROVED BY THE CITY ENGINEER FOR TEMPORARY PLACEMENT ALONG THE PUBLIC RIGHT-OF-WAY SHALL BE ADEQUATELY BARRICADED AS REQUIRED FOR EACH DIRECTION OF TRAVEL.
3. CONTRACTOR IS RESPONSIBLE FOR MAINTENANCE OF ALL SIGNS REQUIRED IN THE TRAFFIC CONTROL PLAN. DAMAGE OR LOSS OF ANY REGULATORY SIGNS OR WARNING SIGNS SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ENGINEER. CONTRACTOR SHALL REIMBURSE THE CITY FOR ALL COSTS INCURRED FOR SIGN MAINTENANCE IF THE CONTRACTOR DOES NOT PROMPTLY REPLACE SIGNS.
4. FOLLOWING CONSTRUCTION, ALL CITY OF CORPUS CHRISTI TRAFFIC SIGNS FOUND TO BE DAMAGED, MISSING, OR IMPROPERLY PLACED SHALL BE REPLACED AND RESTORED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.
5. THE CONTRACTOR SHALL PROVIDE ALL-WEATHER ACCESS TO ALL RESIDENTS AND BUSINESSES AT ALL TIMES DURING CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE TEMPORARY DRIVEWAYS AND/OR ROADS WITH APPROVED MATERIAL DURING WET WEATHER.
6. ALL SIGNS AND BARRICADES USED SHALL BE REFLECTORIZED AND SHALL BE EQUIPPED WITH FLASHING WARNING LIGHTS AS REQUIRED BY TRAFFIC CONTROL PLAN.

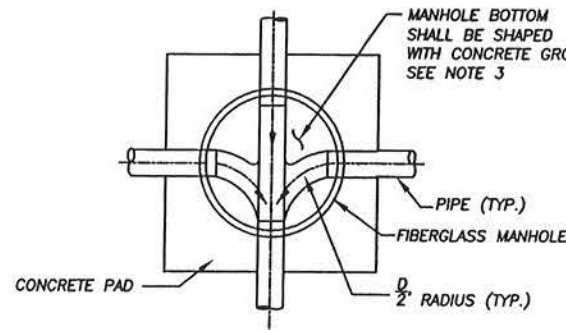


## SANITARY FIBERGLASS MANHOLE WITH DROP CONNECTION DETAIL

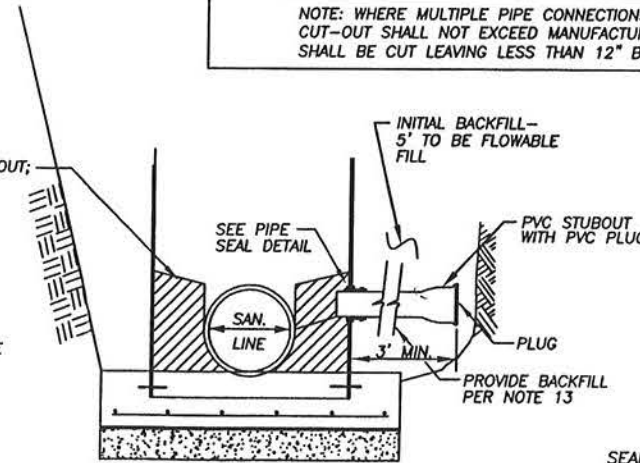
NOT TO SCALE

PIPE DIA. (#) / DEPTH (FT.)	MANHOLE DIA. SELECTION	MANHOLE RING/COVER NORMAL SIZE
< 30" # / < 14 FT. DEEP	4 FT. # M.H.	24"
< 30" # / > 14 FT. DEEP	5 FT. # M.H.	36"
30"-40" # / ANY DEPTH	5 FT. # M.H.	36"

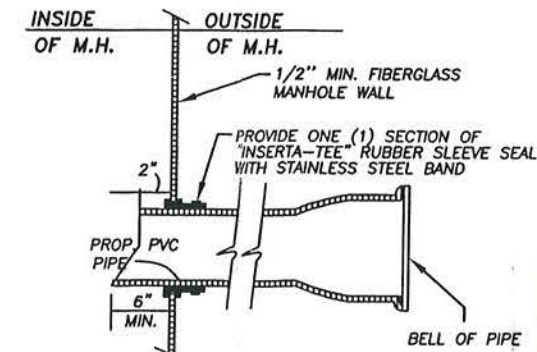
NOTE: WHERE MULTIPLE PIPE CONNECTIONS OCCUR, MAX MANHOLE WALL CUT-OUT SHALL NOT EXCEED MANUFACTURER'S RECOMMENDATION, NOR SHALL BE CUT LEAVING LESS THAN 12" BETWEEN LINES.



**SANITARY SEWER MANHOLE BOTTOM**  
NOT TO SCALE



**STUB-OUT DETAIL**  
NOT TO SCALE



**SEAL NOTES:**

1. INSTALL IN ACCORDANCE WITH MFGS. SPECS SEAL.
2. USE "INSERTA-TEE" TYPE RUBBER SLEEVE SEAL WITH S.S. BAND OR APPROVED EQUAL.

**PIPE SEAL DETAIL**  
NOT TO SCALE

IN CASE OF CONFLICT, DESIGN ENGINEER'S PLANS/SPECS/STDS SHALL TAKE PRECEDENCE

CONSULTANT'S SHEET NO.



CITY OF CORPUS CHRISTI TEXAS  
WASTEWATER DEPARTMENT  
Department of Engineering Services

MANHOLE INSTALLATION  
SANITARY SEWER STANDARD DETAILS 1 OF 5

Details Revision

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12/04

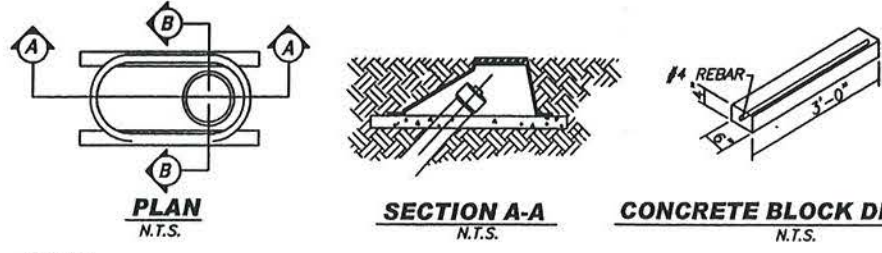
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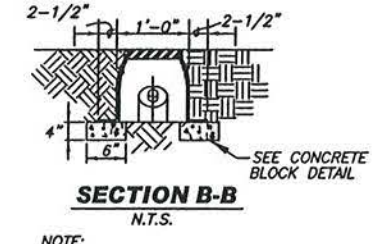
DATE

CITY PROJECT #

SHEET 1 of 5  
RECORD DRAWING NO.



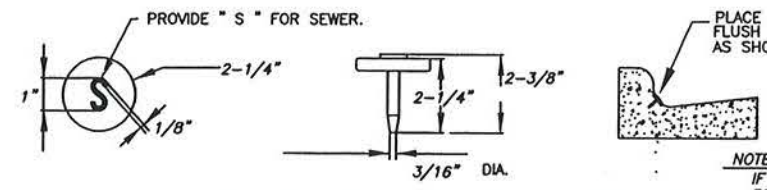
**CONCRETE BLOCK DETAIL**  
N.T.S.



**CLEAN-OUT BOOT**  
N.T.S.

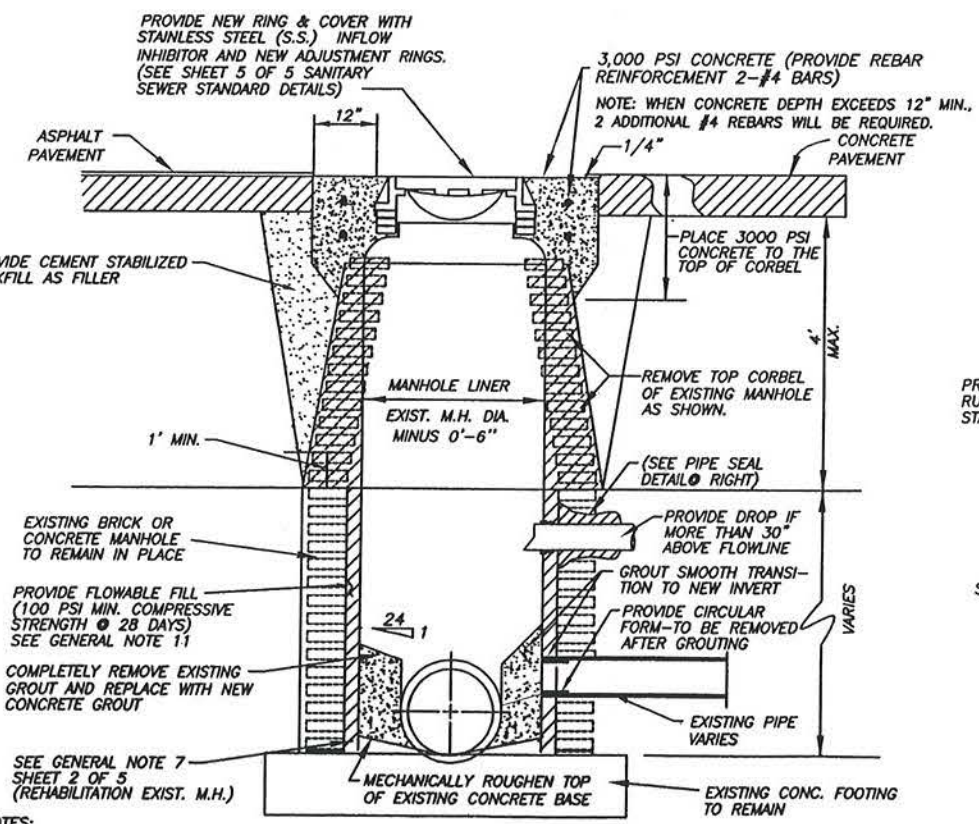
NOTE:  
CLEAN-OUT BOOT, FRAME AND COVER  
EAST JORDAN IRON WORKS, INC.  
NO. V-8505 OR EQUAL

**TYPICAL CLEAN-OUT BOOT**  
N.T.S.



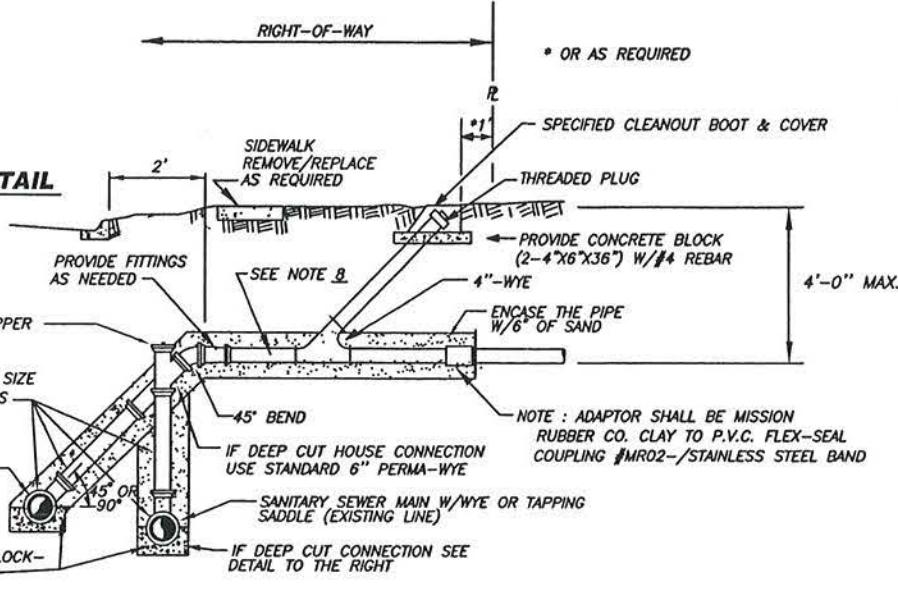
**STANDARD SERVICE MARKER**  
N.T.S.

BRASS - ONE REQUIRED EACH STREET TAP



**REHABILITATION EXISTING MANHOLE**  
N.T.S.

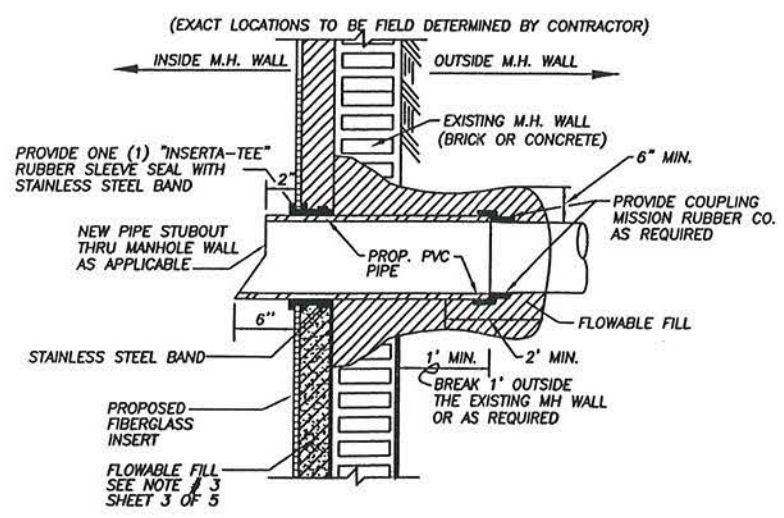
NOTES:  
PROVIDE 2-COATS OF 60 MIL.  
JEFFCOAT 326 OR APPROVED EQUAL  
ON ALL EXPOSED CONCRETE SURFACES,  
INCLUDING CORBEL AREA AND ON THE  
FILLET AREA, AND 6" (MIN.), INTO  
INTERSECTION PIPES.



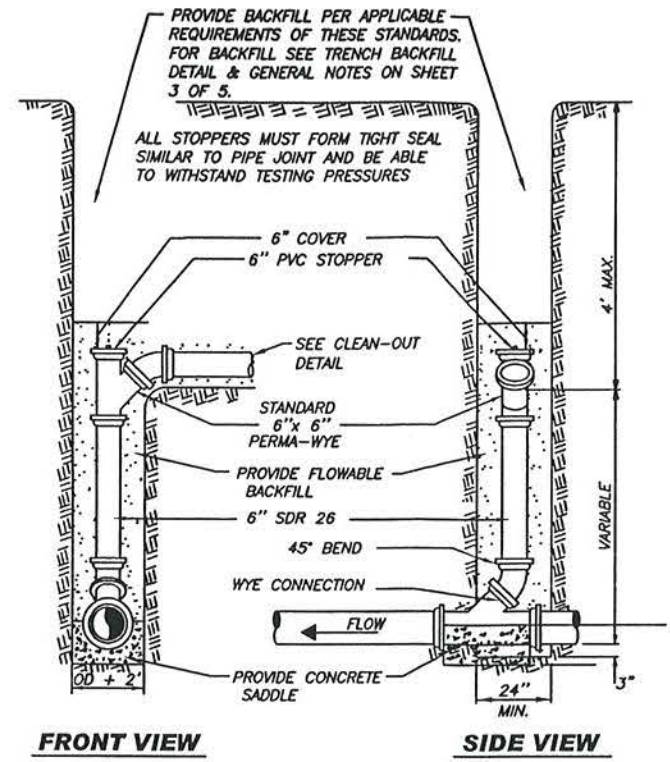
**SERVICE CONNECTION NOTES:**

1. CONTRACTOR TO PROVIDE SERVICE CONNECTION TAP TO THE R.O.W. LINE & CONNECT EXIST. SERVICE LINE OUTSIDE EASEMENT AS SHOWN AND REQUIRED.
2. ALL PIPE TO BE SDR 26 OR SCH. 40 P.V.C. UNLESS SHOWN OTHERWISE IN THE PLANS.
3. ALL FITTINGS TO BE P.V.C. SERVICE CONNECTIONS.
4. ENCASE PIPE IN 6" SAND PER CITY SPECIFICATIONS.
5. CLEAN OUT BOOT TO BE EAST JORDAN IRON WORKS MODEL V-8505 OR APPROVED EQUAL (WHERE SPECIFIED)
6. FOR EXISTING MAIN AND SERVICE P.V.C. AND/OR V.C.P. USE MISSION 4" OR 6" TAPPING SADDLE KIT, AND INCLUDE A CONCRETE BLOCK.
7. FOR NEW P.V.C. MAIN AND SERVICE, USE P.V.C. WYE AT SERVICE CONNECTION AND INCLUDE CONCRETE BLOCK.
8. IF PIPE LENGTH, ON SERVICE LINE, IS GREATER 50' USE 6" P.V.C. PIPE, SDR 26 FROM C.O. WYE TO THE MAIN LINE.

**SERVICE CONNECTION DETAILS**  
N.T.S.



**SANITARY MANHOLE LINER PIPE SEAL DETAIL**  
(FOR NEW PIPES ABOVE MANHOLE INVERT)  
N.T.S.



**DEEP CUT HOUSE CONNECTION**  
N.T.S.

**GENERAL NOTES:  
(REHABILITATION/EXISTING MANHOLE)**

1. CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE CITY INSPECTION REPRESENTATIVE IMMEDIATELY OF ANY SPECIAL CONDITIONS THAT ARE PRESENT ON THE SITE DURING CONSTRUCTION, AT PHONE NO. (361) 880-3555.
2. CONTRACTOR SHALL FIELD VERIFY THE EXISTING MANHOLE DIAMETER, FLOW LINE, RIM ELEVATION, NUMBER OF LATERALS, LOCATIONS, SIZES, AND OTHER INFORMATION NEEDED TO REHABILITATE EACH MANHOLE.
3. BARRICADING AND SIGNS ARE TO BE PLACED TO DIVERT THE TRAFFIC AND PEDESTRIANS PER THE APPROVED TRAFFIC CONTROL PLAN, PRIOR TO INSTALLING THE BYPASS OR INITIATING REPAIRS ON THE MANHOLE, AS REQUIRED.
4. EXCAVATE AROUND THE EXISTING MANHOLE SUFFICIENTLY WIDE AND DEEP FOR REMOVAL OF THE RING AND COVER, REDUCER CONE SECTION AND MASONRY MANHOLE TO ACCOMMODATE THE NEW FIBERGLASS MANHOLE LINER AND NEW RING & COVER W/HEIGHT ADJUSTMENT RING AND STAINLESS STEEL INFLOW INHIBITOR.
5. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING SEWAGE FLOWS AT ALL TIMES. CONTRACTOR IS REQUIRED TO HAVE ALL MATERIALS AND BY-PASS PUMPING EQUIPMENT NECESSARY TO BYPASS THE FLOW WHILE REHABILITATION OF THE MANHOLE IS IN PROCESS.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFORMING WITH THE O.S.H.A. REGULATIONS PERTAINING TO CONFINED SPACE ENTRY IN THE MANHOLES, AND TRENCH SAFETY IN ANY EXCAVATIONS.
7. PREPARE THE INTERIOR OF THE EXISTING STRUCTURE BY REMOVING ALL GROUT TO ORIGINAL CONCRETE BASE, DEBRIS AND BLOCKAGES, AND THEN MECHANICALLY ROUGHEN ENTIRE INVERT, CLEAN THE INTERIOR WITH HIGH-PRESSURE WATER JET.
8. DISPOSAL OF THE RESULTING SLUDGE AND DEBRIS SHALL BE THE CONTRACTOR'S RESPONSIBILITY, AND SHALL BE DISPOSED AT APPROVED SITE MEETING ALL REGULATIONS.
9. THE NEW FIBERGLASS MANHOLE LINER SHALL CONFORM TO CITY STANDARD SPECIFICATIONS.
10. FORM BOTTOM SEAL AROUND THE PERIMETER OF THE LINER. QUICK-SETTING, NON-SHRINK CONCRETE GROUT TO SEAL AND RESHAPE THE BOTTOM AS DIRECTED. GROUT MIX TO SET THE FIBERGLASS MANHOLE ON THE CONCRETE BASE SHALL MEET THE FOLLOWING STRENGTH REQUIREMENTS: (MIN. 6" THICKNESS)

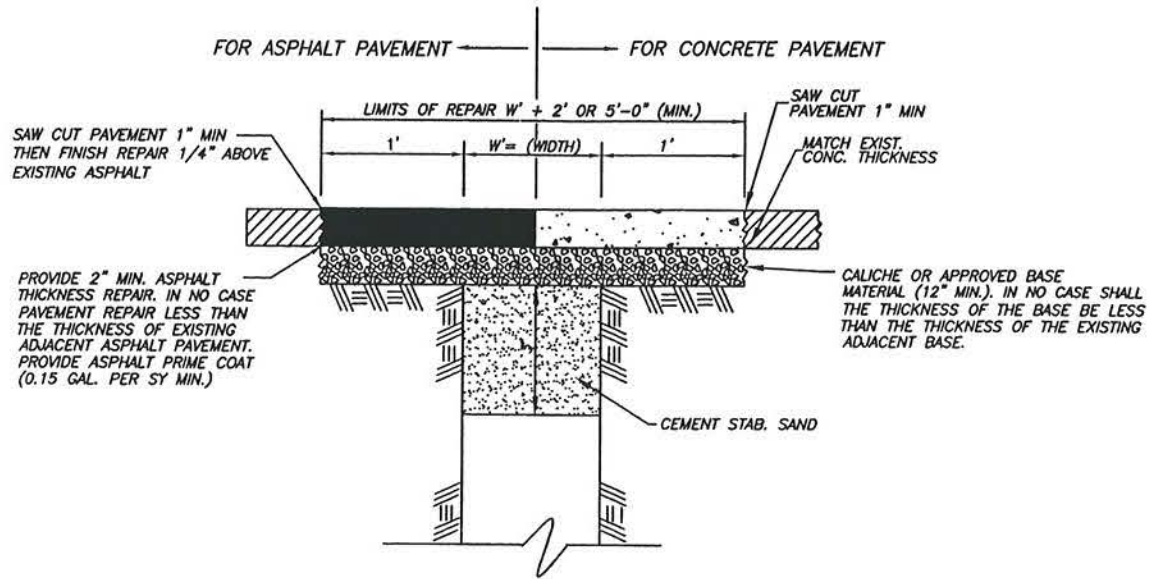
COMPRESSIVE (ASTM C579B)	3250 PSI IN 24 HOURS
	4450 PSI IN 7 DAYS
BOND STRENGTH (ASTM C321)	30 PSI IN 1 HOUR
	80 PSI IN 24 HOURS

11. AFTER THE MANHOLE LINER IS INSTALLED, GROUT IS SET AND CURED, FILL THE ANNULAR SPACE BETWEEN THE NEW LINER AND THE EXISTING STRUCTURE WITH FLOWABLE FILL AS APPROVED BY THE ENGINEER TO ONE (1') FOOT ABOVE START OF CORBEL.
12. MANHOLE LINER TO BE RATED FOR AASHTO-H-20 LOADING.
13. INSTALL NEW MANHOLE RING COVER WITH STAINLESS STEEL INFLOW INHIBITOR. RING COVER TO BE EAST JORDAN IRON WORKS OR APPROVED BY WASTEWATER DEPARTMENT.

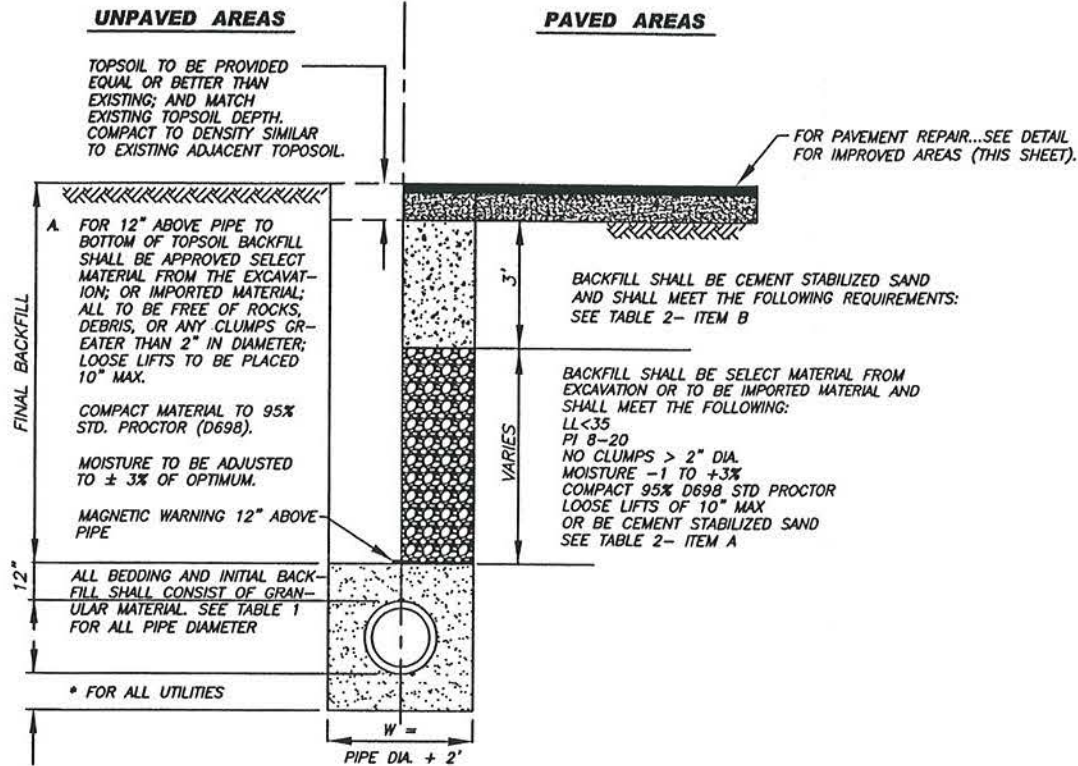
IN CASE OF CONFLICT, DESIGN ENGINEER'S  
PLANS/SPECS/STDS SHALL  
TAKE PRECEDENCE

CITY OF CORPUS CHRISTI TEXAS		WASTEWATER DEPARTMENT		Department of Engineering Services
SERVICE CONNECTIONS AND REHABILITATION OF EXISTING MANHOLES		SANITARY SEWER STANDARD DETAILS		2 of 5
REVISION NO.	DATE	BY	DESCRIPTION	
12/04	CF		Details Revision	
SHEET 2 of 5				
RECORD DRAWING NO.				
CITY PROJECT #				

FILE: /MProject/lateststds/stds2004REV1/SAN2004-2.dwg 11/2004



**IMPROVED AREAS  
(EXISTING OR PROPOSED PAVEMENT)**  
NOT TO SCALE



\* FOR PIPE DIAMETER EQUAL TO OR SMALLER THAN 16", USE 4" MINIMUM BEDDING UNDER PIPE.  
FOR PIPE DIAMETER GREATER THAN 16", USE 6" MINIMUM BEDDING UNDER PIPE.

**TRENCH BACKFILL AND PAVEMENT REPAIR  
FOR WASTEWATER LINES**  
NOT TO SCALE

**GENERAL NOTES FOR BACKFILL**

**TABLE 1  
BEDDING AND INITIAL BACKFILL  
(BELOW PIPE TO 12" ABOVE PIPE)**

ALL BEDDING AND INITIAL BACKFILL SHALL CONSIST OF GRANULAR MATERIAL CONSISTING OF EITHER NATURAL SAND OR SANDY GRAVEL, OR MATERIAL PRODUCED BY CRUSHING OF NATURAL STONE OR GRAVEL.

SEWER LINES:  
1. EXCAVATIONS <20FT. DEEP AND ABOVE WATER TABLE, USE MATERIAL MEETING THE FOLLOWING CRITERIA.

MEETING REQUIREMENTS OF ASTM D2487 FOR:

SP	GP
SW	GW
SP-SM	GP-GM
SW-SM	GW-GM

AND IN ADDITION:  
PASSING 1/2" SIEVE - 100%  
PASSING #4 SIEVE - 30% MINIMUM  
PLASTICITY INDEX (PI) - NP TO 10 MAX.

2. IN DEEP EXCAVATIONS (>20') OR BELOW WATER TABLE, USE CRUSHED STONE OR CRUSHED GRAVEL MEETING GRADATION OF:

A. CONCRETE COARSE AGGREGATE; TxDOT ITEM #21; GRADE 2, 3, OR 4.

WATER LINES:

3. FOR WATER PIPE EMBEDMENT, USE THE FOLLOWING:  
SP OR SW, (SAND WITH UP TO 12% ALLOWABLE PASSING #200 SIEVE).

AND IN ADDITION:  
PASSING #8 SIEVE - 100%  
PASSING #16 SIEVE - 70%

FOR ALL UTILITIES:

- FOR PIPE DIAMETER EQUAL TO OR SMALLER THAN 16", USE 4" MINIMUM BEDDING UNDER PIPE.
- FOR PIPE DIAMETER GREATER THAN 16", USE 6" MINIMUM BEDDING UNDER PIPE.

**TABLE 2  
FINAL BACKFILL  
(GREATER THAN 12" ABOVE PIPE)**

**UNPAVED AREAS PAVED AREAS**

A. FOR 12" ABOVE PIPE TO BOTTOM OF TOPSOIL BACKFILL SHALL BE APPROVED SELECT MATERIAL FROM THE EXCAVATION; OR IMPORTED MATERIAL; ALL TO BE FREE OF ROCKS, DEBRIS, OR ANY CLUMPS GREATER THAN 2" IN DIAMETER; LOOSE LIFTS TO BE PLACED 10" MAX.

COMPACT MATERIAL TO 95% STD. PROCTOR (D698).

MOISTURE TO BE ADJUSTED TO ± 3% OF OPTIMUM.

B. TOPSOIL TO BE PROVIDED EQUAL OR BETTER THAN EXISTING; AND MATCH EXISTING TOPSOIL DEPTH. COMPACT TO FIX CONFLICT TO EXISTING ADJACENT TOPSOIL. (CONSTRUCTION TO BE PERFORMED BY "DOUBLE DITCH" METHOD-TOP SOIL SALVAGED TO BE PLACED ON TOP)

A. FOR 12" ABOVE PIPE TO 3' BELOW BOTTOM OF ROAD BASE: BACKFILL SHALL BE SELECT MATERIAL FROM EXCAVATION OR TO BE IMPORTED MATERIAL AND SHALL MEET THE FOLLOWING:

LL<35  
PI 8-20  
NO CLUMPS > 2" DIA.  
MOISTURE -1 TO +3%  
COMPACT 95% D698 STD PROCTOR

LOOSE LIFTS OF 10" MAX OR IF SELECT MATERIAL FROM EXCAVATION DOES NOT MEET REQUIREMENTS, THEN USE CEMENT STABILIZED SAND SEE TABLE 2-ITEM B

B. FOR 3' BELOW BOTTOM OF ROAD BASE TO BOTTOM OF ROAD BASE:

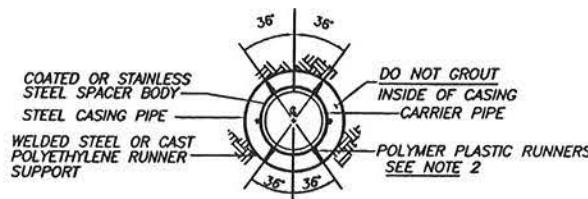
BACKFILL SHALL BE CEMENT STABILIZED SAND AND SHALL MEET THE FOLLOWING REQUIREMENTS:

SAND GRADATION:

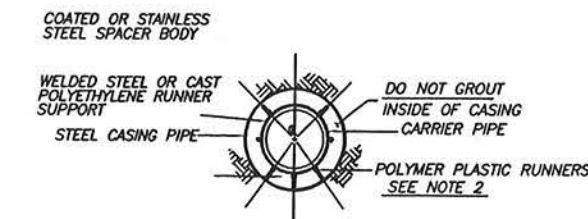
% PASSING	
1/2"	100%
#4	55-100
#10	40-100
#40	25-100
#200	10-20
PI	NP-10

CEMENT = 6-7% BY WEIGHT; MINIMUM 100 PSI @ 48 HOURS.

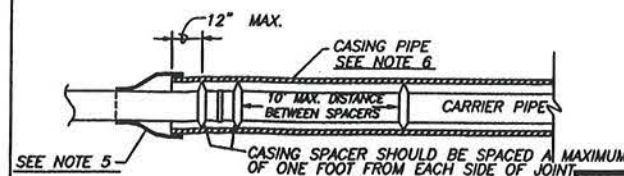
COMPACT TO 95% OF D588. MOISTURE TO BE ADJUSTED TO (+/-2%) OF OPTIMUM.



**4" TO 10" CASING DETAIL**  
NOT TO SCALE



**12" TO 36" CASING DETAIL**  
NOT TO SCALE



**CASING DETAIL**  
NOT TO SCALE

**GENERAL NOTES - CASINGS**

- CASING DIAMETER, LENGTH, LOCATION AND WALL THICKNESS SHALL BE PER PROJECT SPECIFIC REQUIREMENTS.
- ALL CARRIER PIPE IN CASINGS INSTALLED SHALL BE SUPPORTED BY BOLT-ON STYLE CASING SPACERS ("ADVANCED PRODUCTS" OR APPROVED EQUAL).
- PROVIDE MECHANICALLY RESTRAINED JOINTS FOR FORCE MAINS ONLY ON CARRIER PIPE USE "MEGALUG" TYPE JOINT RESTRAINTS OR APPROVED EQUAL.
- CASING SPACERS SHALL BE SIZED TO SECURELY FASTEN TO THE CARRIER PIPE O.D. AND SHALL BE FURNISHED WITH A MINIMUM RUNNER HEIGHT TO MAINTAIN SEPARATION BETWEEN CARRIER PIPE MAX O.D. & CASING WALL.
  - POSITIONING OF SPACERS SHALL ENSURE THAT THE CARRIER PIPE IS ADEQUATELY SUPPORTED THROUGHOUT ITS LENGTH.
  - SPACERS AT EACH END SHALL NOT BE FURTHER THAN 12" FROM THE END OF THE CASING.
  - CASING SPACERS SHALL BE INSTALLED IN THE CENTER OF THE PIPE SECTION. MAXIMUM SPACER SPACING IS 10 FEET.
- THE TWO ENDS OF THE CASING PIPE SHALL BE SEALED WATERTIGHT WITH AN "ADVANCE PRODUCTS SYSTEM, INC., MODEL AZ - ZIPPER" OR "PSI MODEL C END SEAL" OR ENGINEER APPROVED EQUAL.
- CASING PIPE SHALL BE PAINTED OUTSIDE WITH 2 COATS OF COAL TAR EPOXY. (10 MIL. DRY FILM THICKNESS, MIN.)

IN CASE OF CONFLICT, DESIGN ENGINEER'S PLANS/SPECS/STDS SHALL TAKE PRECEDENCE

11/2004

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12/04 CF Details Revision

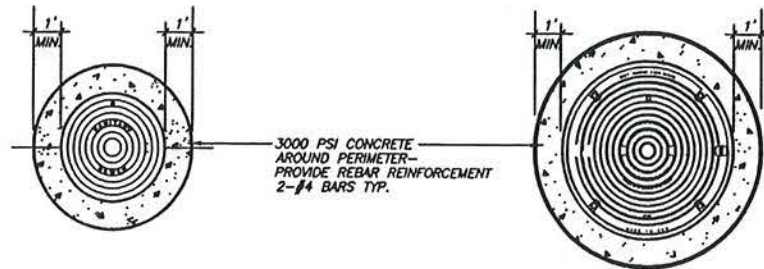
REVISION NO. DATE BY DESCRIPTION

REVISION NO. DATE BY DESCRIPTION

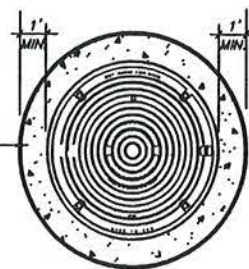
CITY OF  
CORPUS CHRISTI  
TEXAS  
WASTEWATER  
DEPARTMENT  
Department of Engineering Services

PAVEMENT REPAIRS/BACKFILL/  
GENERAL NOTES/CASING DETAILS  
SANITARY SEWER  
STANDARD DETAILS 3 OF 5

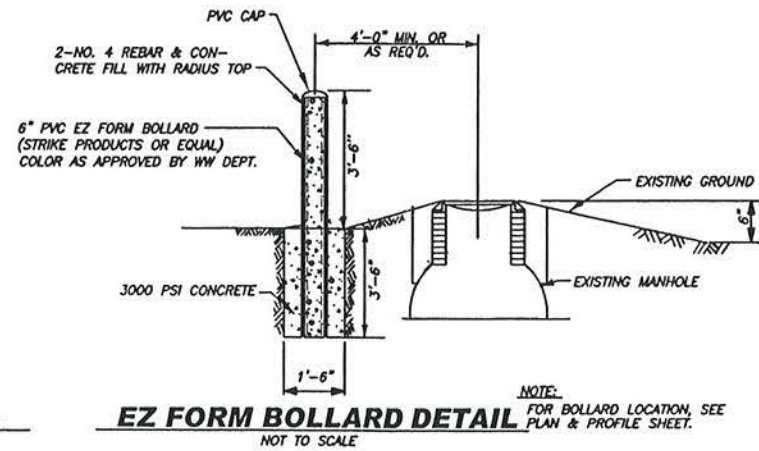
SHEET 3 of 5  
RECORD DRAWING NO.  
CITY PROJECT #



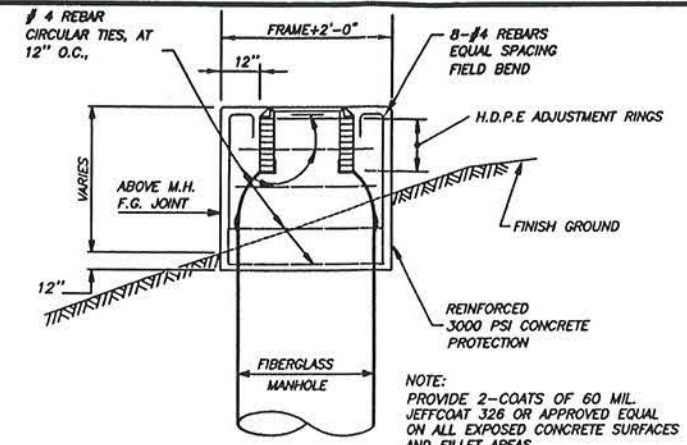
**2'-0" DIA. ROUND MANHOLE RING & COVER COLLAR DETAIL**  
N.T.S.



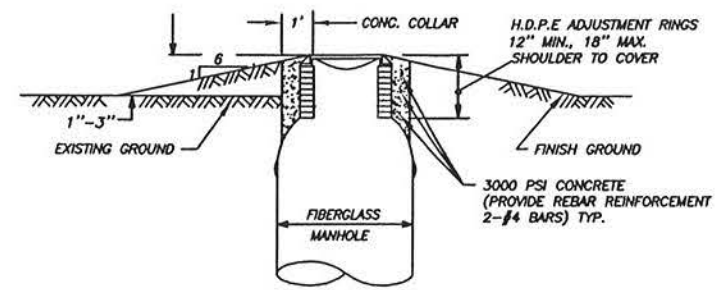
**3'-0" DIA. ROUND MANHOLE RING & COVER COLLAR DETAIL**  
N.T.S.



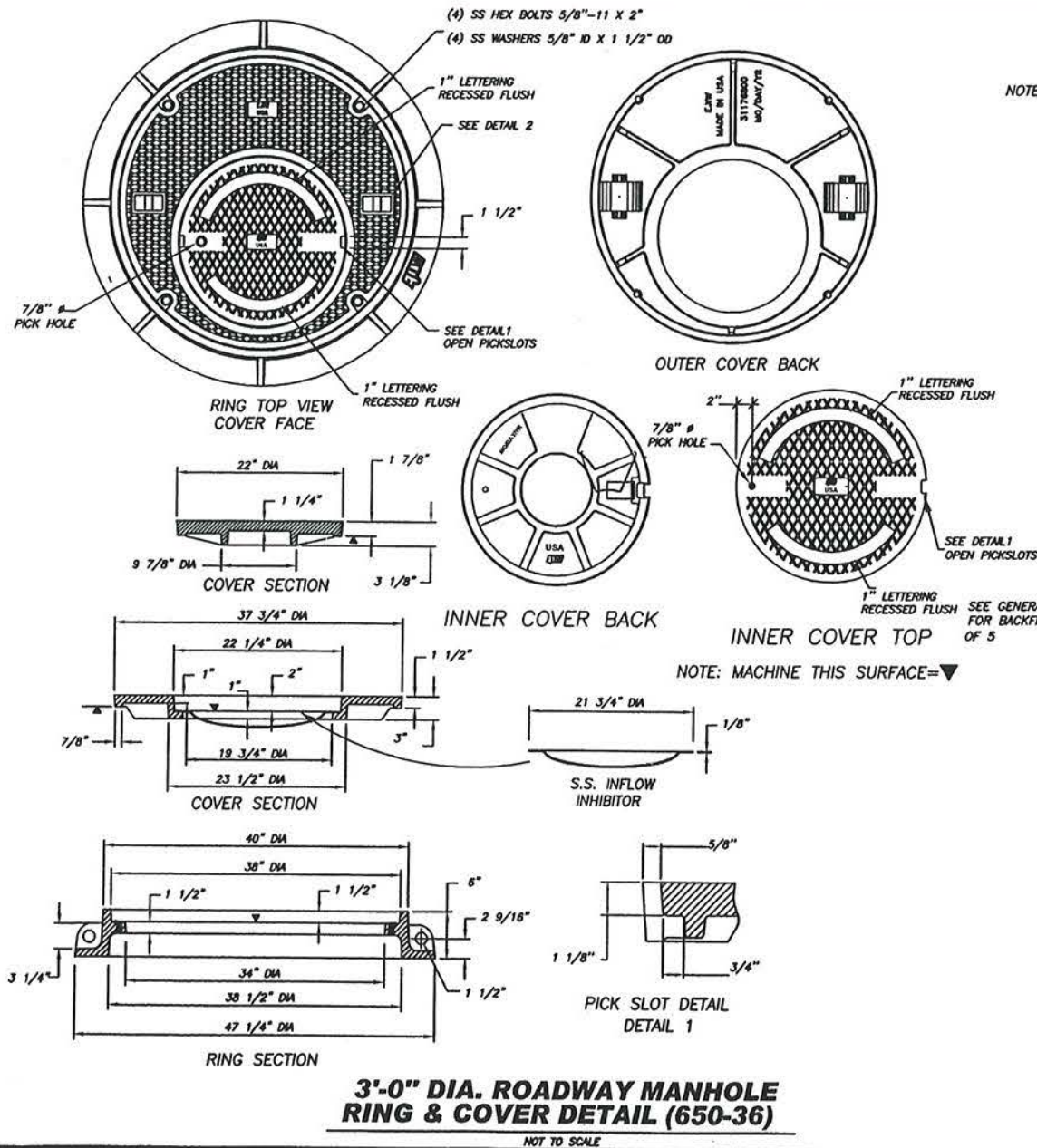
**EZ FORM BOLLARD DETAIL**  
NOTE: FOR BOLLARD LOCATION, SEE PLAN & PROFILE SHEET.  
NOT TO SCALE



**PROTECTION FOR FIBERGLASS MANHOLE IN UNPAVED AREAS (CULTIVATED/SPECIAL)**  
NOT TO SCALE

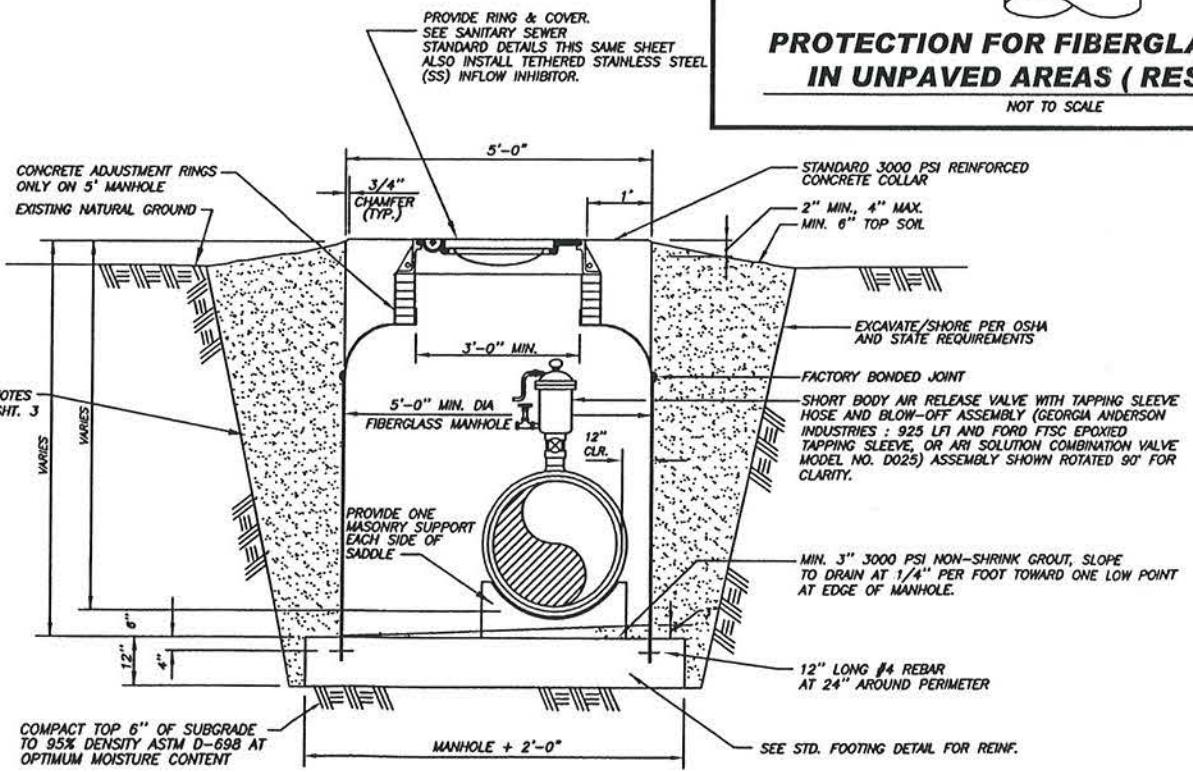


**PROTECTION FOR FIBERGLASS MANHOLE IN UNPAVED AREAS (RESIDENTIAL)**  
NOT TO SCALE



**3'-0" DIA. ROADWAY MANHOLE RING & COVER DETAIL (650-36)**  
NOT TO SCALE

NOTE: AASHTO-M-306 PROOF LOAD TESTING IS REQUIRED AND SHALL BE CONDUCTED IN ACCORDANCE WITH SECTION 7.0 (40,000LBS.) AND INSPECTED IN ACCORDANCE WITH SECTION 9.1.1. RESULTS OF THE TEST SHALL BE SUBMITTED TO THE CITY PRIOR TO INSTALLATION.



**AIR RELEASE VALVE ON 5' FIBERGLASS MANHOLE**  
NOT TO SCALE

IN CASE OF CONFLICT, DESIGN ENGINEER'S PLANS/SPECS/STDS SHALL TAKE PRECEDENCE

CONSULTANT'S SHEET NO.



FILE: \\MP\Project\latest\2004\REVISED SAN STD\SAN2004-4.dwg 11/2004

CITY OF CORPUS CHRISTI, TEXAS WASTEWATER DEPARTMENT		Department of Engineering Services	
MANHOLE SURFACE PROTECTION AND CONCRETE DETAILS		SANITARY SEWER STANDARD DETAILS 4 OF 5	
REVISION NO.	DATE	BY	DESCRIPTION
12/04		CF	Details Revision
SHEET 4 of 5		RECORD DRAWING NO.	
CITY PROJECT #			

### ROADWAY MANHOLE RING & COVER NOTES

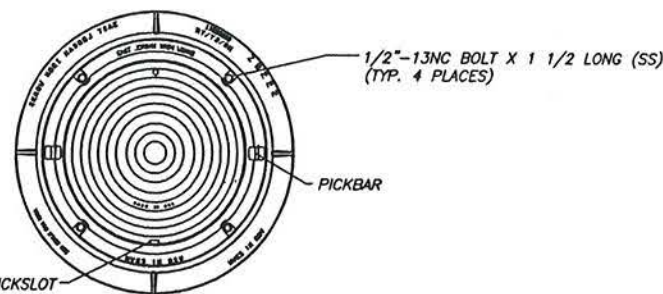
- THESE DETAILS SHOW GREY-IRON CASTINGS, FILLETED AT ANGLES WITH SHARP AND PERFECT ARISES.
- CASTING SHALL BE TRUE TO PATTERN, FORM, AND DIMENSIONS, FREE FROM CRACKS, SPONGINESS AND BLOWHOLES.
- MACHINE SURFACES TO FIELD FIT WHICH WILL NOT RATTLE WITH PASSING TRAFFIC LOAD, AND ACCEPT STAINLESS STEEL (S.S.) INFLOW INHIBITOR SO THAT INNER LID IS FLUSH WITH OUTER LID.
- TRAFFIC SHALL BE RESTRICTED FROM M.H. FOR 48 HOURS AFTER PLACEMENT OF CONCRETE.
- H.D.P.E. MANHOLE HEIGHT ADJUSTMENT RINGS SHALL BE DESIGNED TO SUPPORT H-20 REQUIRED TRAFFIC LOADING.
- OTHER CASTING PATTERNS FOR RING & COVERS MAY BE SUBMITTED FOR APPROVAL PROVIDED THE PLAN PATTERN OF COVER IS THE SAME AS SHOWN ON THIS SHEET AND PROVIDED OTHER CASTINGS SHALL BE COMPLETELY INTERCHANGEABLE, I.E., THE COVERS OF THIS SHEET SHALL

FIT PROPERLY, THE RINGS OF OTHER CASTING DETAILS AND THE COVERS OF OTHER CASTINGS SHALL FIT THE RINGS OF THIS SHEET.

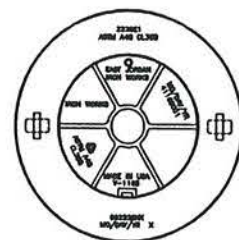
- MINIMUM WEIGHTS OF FINISHED CASTINGS :
 

A. 2'-0" RING AND COVER	B. 3'-0" RING AND COVER
COVER - 160 LBS.	INNER COVER - 160 LBS.
RING - 175 LBS.	OUTER COVER - 232 LBS.
	FRAME - 265 LBS.
- WHEREVER SANITARY SEWER MANHOLES ARE SUBJECT TO INUNDATION BY STORM WATER AND IF SHOWN IN THE PLANS AS A REQUIREMENT, THE MANHOLE COVERS SHALL HAVE GASKET AND BE BOLTED. WHERE GASKET MANHOLE COVERS ARE REQUIRED FOR MORE THAN THREE MANHOLES IN SEQUENCE, ALTERNATE MEANS OF VENTING SHALL BE PROVIDED. THE BOLTS SHALL BE STAINLESS STEEL, 1/2 INCH IN DIAMETER, EQUALLY SPACED, THREE (3) MINIMUM A SOLID STANDARD COVER WITH A PICK BAR SHALL BE USED. THE GASKET SHALL BE 1/8" THICK NEOPRENE RUBBER.

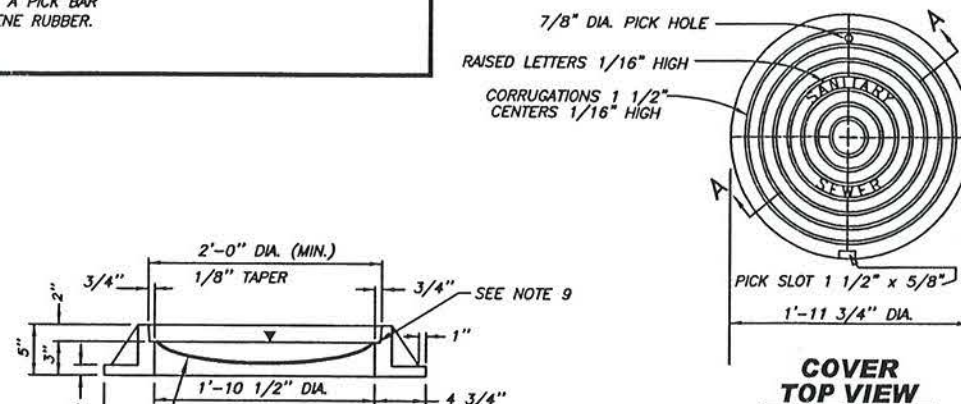
- APPLY NON-SEIZE GRAPHITE OR APPROVED EQUAL AROUND ALL MANHOLE RING & COVER, PRIOR TO INSTALLATION.
- AASHTO-M-306 PROOF LOAD TESTING IS REQUIRED AND SHALL BE CONDUCTED IN ACCORDANCE WITH SECTION 7.0 (40,000LBS.) AND INSPECTED IN ACCORDANCE WITH SECTION 9.1.1. RESULTS OF THE TEST SHALL BE SUBMITTED TO THE CITY PRIOR TO INSTALLATION.



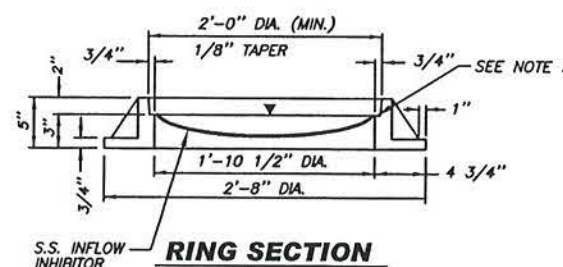
**RING & COVER PLAN VIEW**



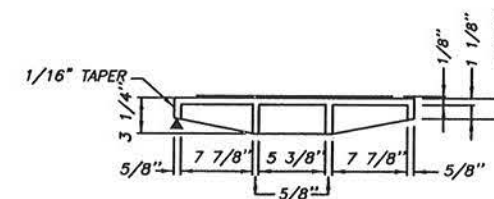
**COVER BOTTOM VIEW**



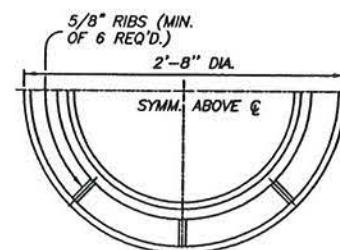
**COVER TOP VIEW**



**RING SECTION**  
DENOTES 304 STAINLESS STEEL

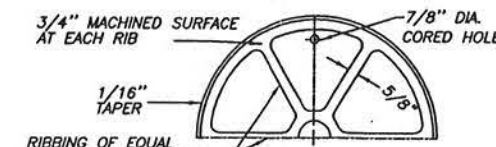


**SECTION 'A-A' ON CENTERLINE**

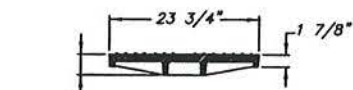


**RING HALF-PLAN**

NOTE: MACHINE THIS SURFACE = ▽

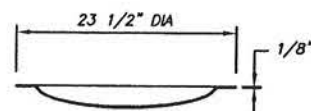


**COVER HALF BOTTOM VIEW**

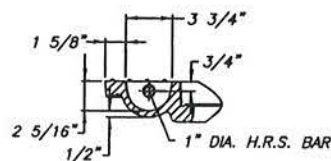


**INNER COVER SECTION**

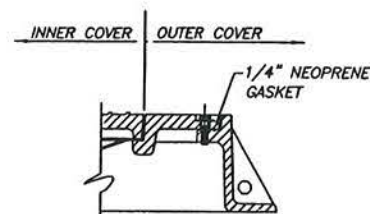
Inflow Inhibitor to be secured to frame with a Stainless steel wire, and SS dish is to have a relief valve.



**STAINLESS STEEL (S.S.) INFLOW INHIBITOR**



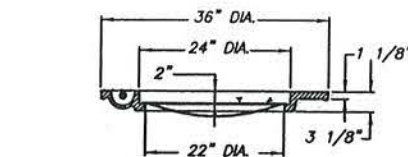
**PICKBAR DETAIL**



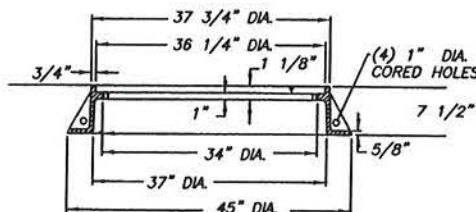
**BOLTING DETAIL**

(WHERE REQUIRED)  
(Bolt to completely penetrate bolt tab on frame)

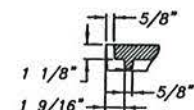
NOTE: MACHINE THIS SURFACE = ▽



**COVER SECTION VIEW**



**OUTER SECTION OF FRAME**



**PICKSLOT DETAIL**

MANHOLE	RING & COVER	INHIBITOR	COMMENTS
5' - 0" OR LARGER	EAST JORDAN IRON WORKS, INC. PRODUCT NO. 22801 OR APPROVED EQUAL (MILLED COVER FOR S.S. INFLOW INHIBITOR)	• PER CITY SPECIFICATION • FOR INNER LID ONLY	• NO STACKING LUGS • OUTER LID TO HAVE PICK BARS, GASKET

**RING & COVER DETAIL FOR 5' DIA. MANHOLE INSTALLATION**

NOT TO SCALE

MANHOLE	RING & COVER	INHIBITOR	COMMENTS
4' - 0"	EAST JORDAN IRON WORKS, INC. V-1168, PRODUCT NO. 41168051 OR APPROVED EQUAL WITH MILLED COVER FOR INHIBITOR	• PER CITY STANDARD SPECIFICATION	• NO BOLTS ASSEMBLY

**RING & COVER DETAIL FOR 4' DIA. MANHOLE INSTALLATION**

NOT TO SCALE

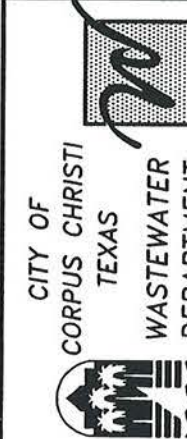
IN CASE OF CONFLICT, DESIGN ENGINEER'S PLANS/SPECS/STDS SHALL TAKE PRECEDENCE

12/04 CF Details Revision

REVISION NO. DATE BY DESCRIPTION

RING AND COVER DETAILS FOR 4' AND 5' MANHOLES

SANITARY SEWER STANDARD DETAILS



Department of Engineering Services

SHEET 5 of 5  
RECORD DRAWING NO.  
CITY PROJECT #

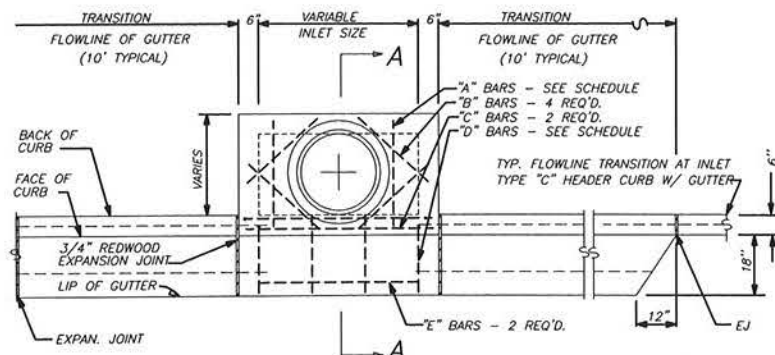
11-2004

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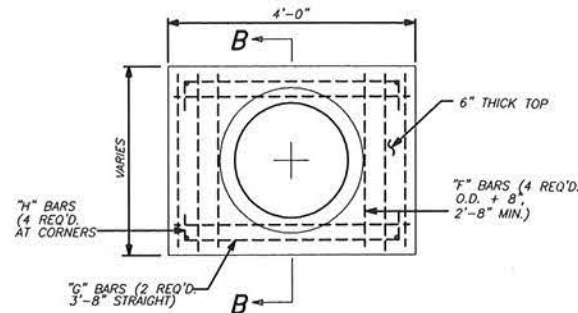
**EXHIBIT NO. 9**

**CITY STANDARD FOR:  
STORM WATER  
DETAILS**

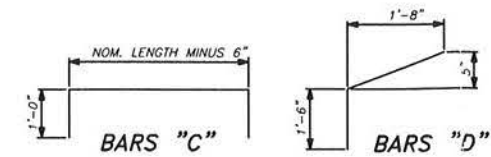
**(Standards will be provided at a later date)**



**PLAN OF STANDARD INLET**  
NOT TO SCALE



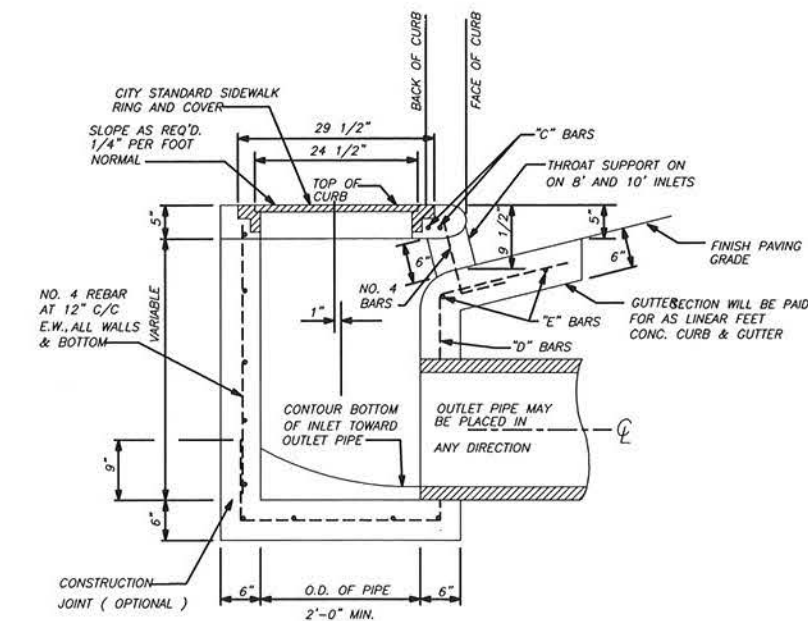
**PLAN OF STANDARD POST INLET**  
NOT TO SCALE



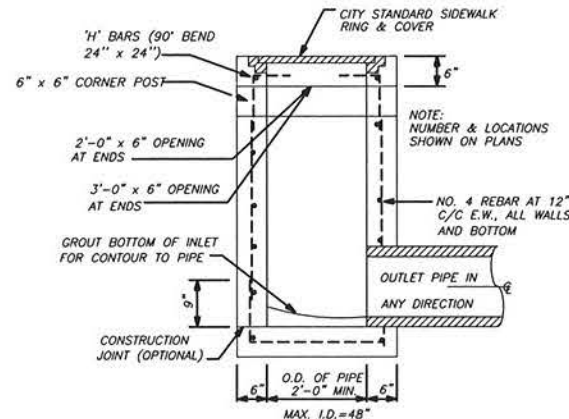
\*\* THROAT OPENINGS SHALL HAVE A 6" X 6" CONCRETE SUPPORT PLACED AT MID-THROAT  
\* NOMINAL LENGTH OF INLET SHALL BE DESIGNATED AS THE CLEAR WIDTH OPENING.

STANDARD CURB INLET STEEL SCHEDULE					
ALL BARS No. 4 PREFORMED					
INLET SIZE (Nom. Length)	NO. REQ'D./LENGTH				
	"A" BARS	"B" BARS	"C" BARS	"D" BARS	"E" BARS
4'	2/0	4/1'-10"	2/5'-6"	4/3'-2"	2/4'-6"
5'	2/0	4/3'-2"	2/6'-6"	4/3'-2"	2/5'-6"
6'	4/0	4/4'-0"	2/7'-6"	6/3'-2"	2/6'-6"
8'	4/0	4/4'-0"	2/9'-6"	6/3'-2"	2/8'-6"
10'	6/0	4/4'-0"	2/11'-6"	7/3'-2"	2/10'-6"
BENDING	STRAIGHT	STRAIGHT	SEE DET.	SEE DET.	STRAIGHT

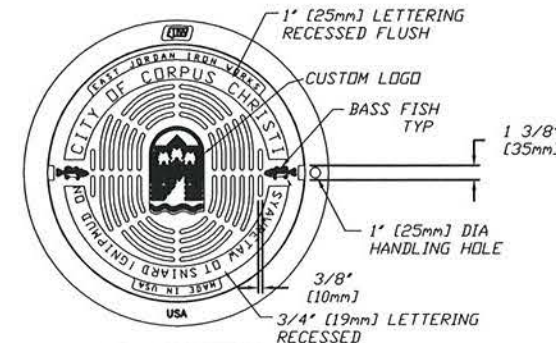
o = O.D. + 8", 2'-8" MIN.      MAX. PIPE I.D. = 48 INCHES



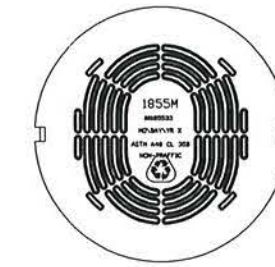
**SECTION A-A**  
NOT TO SCALE



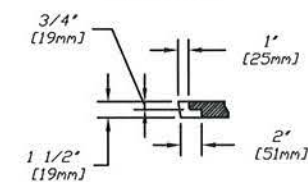
**SECTION B-B**  
NOT TO SCALE



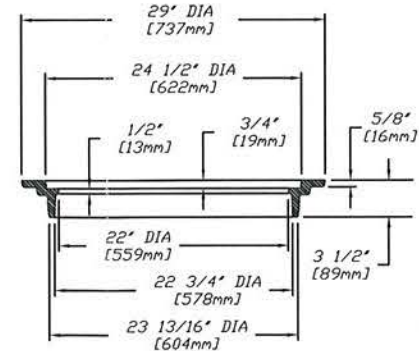
**PLAN VIEW**  
NOT TO SCALE



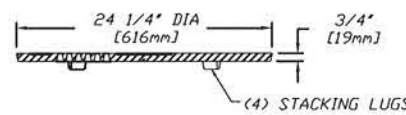
**GRATE BACK**  
NOT TO SCALE



**PICKSLOT DETAIL**  
NOT TO SCALE

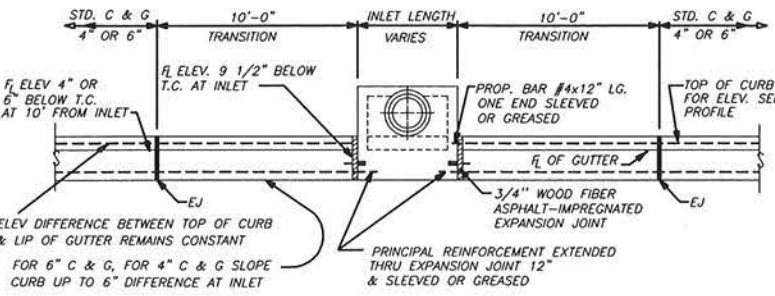


**RING SECTION**  
NOT TO SCALE

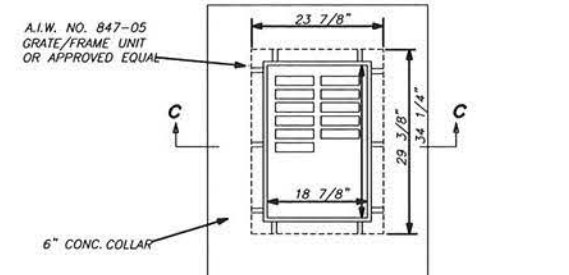


**GRATE SECTION**  
NOT TO SCALE  
MACHINED SURFACE

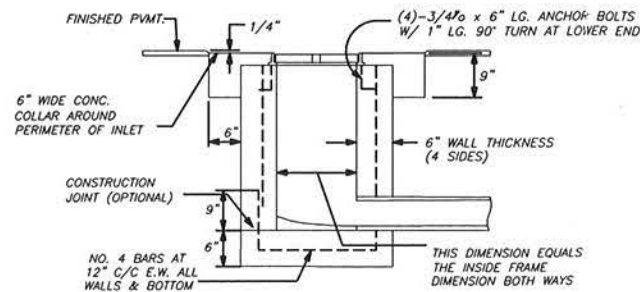
**SECTION THRU RING & COVER AT ANCHOR BOLT**  
NOT TO SCALE



**FLOWLINE TRANSITION AT INLET FOR 4" OR 6" STD. CURB AND GUTTER**  
NOT TO SCALE



**PLAN OF STANDARD GRATE INLET**  
NOT TO SCALE



**SECTION C-C**  
NOT TO SCALE

**INLET AND SIDEWALK MANHOLE RING & COVER NOTES**

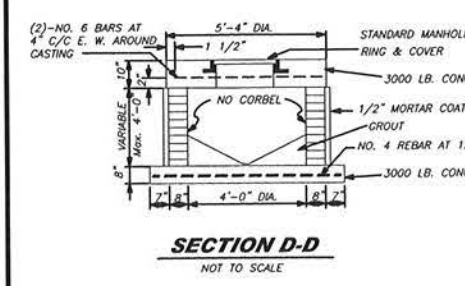
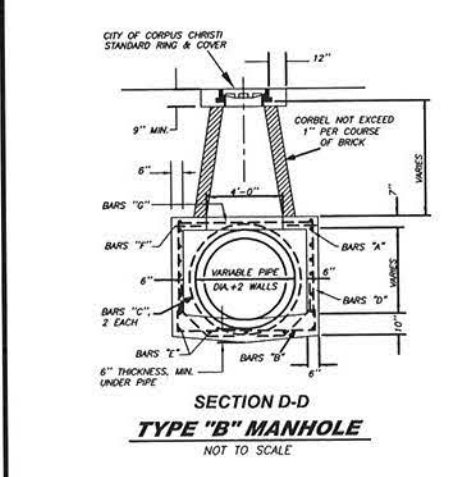
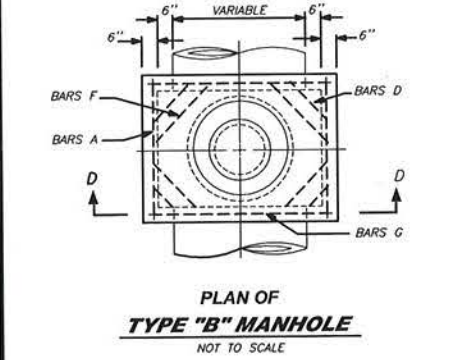
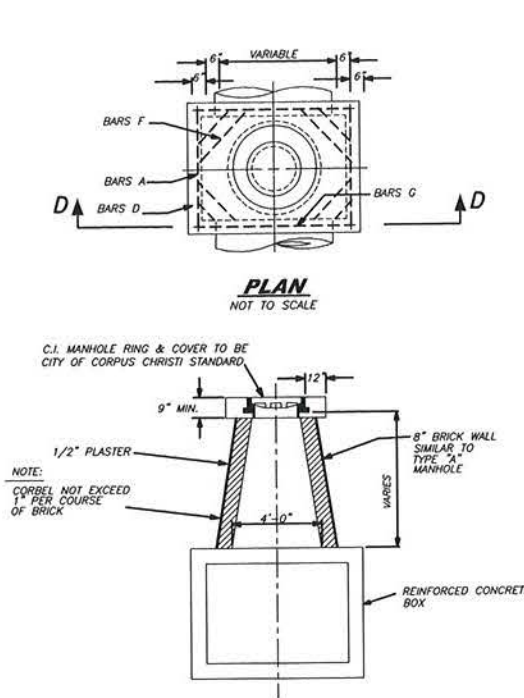
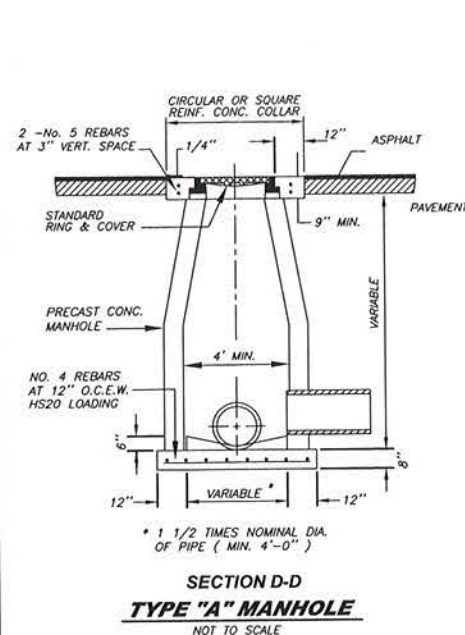
1. MANHOLE RING & COVER SHALL BE BY EAST JORDAN MANHOLE ASSEMBLY FOR LOAD RATING NON-TRAFFIC
2. THESE DETAILS SHOW GREY-IRON CASTINGS, FILLETED AT ANGLES WITH SHARP AND PERFECT ARISING.
3. CASTING SHALL BE TRUE TO PATTERN, FORM, AND DIMENSIONS, FREE FROM CRACKS, SPONGINESS AND BLOWHOLES.
4. MACHINE SURFACES TO YIELD FIT WHICH WILL NOT RATTLE WITH PASSING TRAFFIC LOAD.
5. TRAFFIC SHALL BE RESTRICTED FROM M.H. FOR 36 HOURS AFTER PLACEMENT OF RING.
6. RING AND COVER SHALL BE DIPPED IN COAL TAR OR ASPHALT.
7. OTHER CASTING PATTERNS FOR RING & COVERS MAY BE SUBMITTED FOR APPROVAL PROVIDED THE PLAN PATTERN OF COVER IS THE SAME AS SHOWN ON THIS SHEET AND PROVIDED OTHER CASTINGS SHALL BE COMPLETELY INTERCHANGEABLE, I.E., THE COVERS OF THIS SHEET SHALL FIT PROPERLY, THE RINGS OF OTHER CASTING DETAILS AND THE COVERS OF OTHER CASTINGS SHALL FIT THE RINGS OF THIS SHEET.
8. MINIMUM WEIGHTS OF FINISHED CASTINGS: THE COVER = 60 POUNDS, THE RING = 135 POUNDS.

CITY OF CORPUS CHRISTI TEXAS  
STORM WATER DEPARTMENT  
Department of Engineering Services

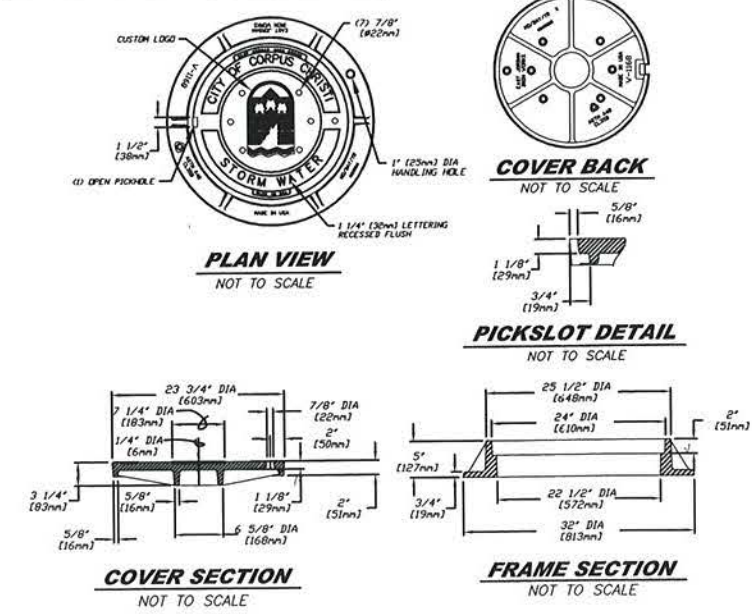
INLET AND SIDEWALK MANHOLE RING AND COVER  
STANDARD STORM WATER DETAILS

ADDENDUM NO. 1  
R.S. BY  
DATE 06/05  
REVISION NO.

SHEET \_\_\_\_ of \_\_\_\_  
RECORD DRAWING NO.  
CITY PROJECT #

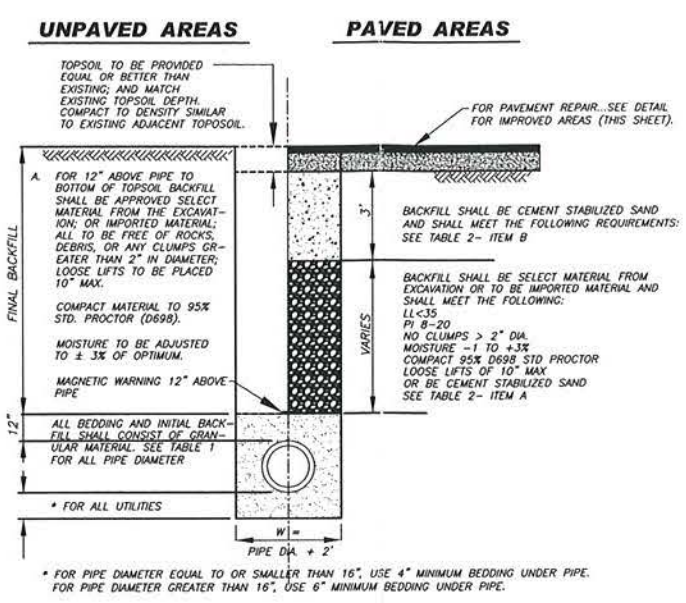
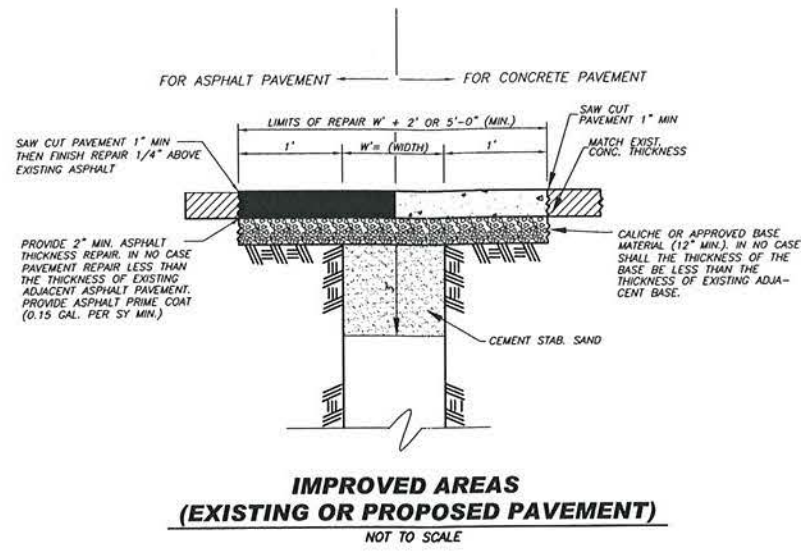


**NOTE:**  
THE TYPE "C" MANHOLE IS FOR ACCESS TO REINFORCED CONCRETE BOXES AND SHALL CONSIST OF THE OPENING IN THE BOX AND THE CORBELLED PORTION OF THE TYPE "A" MANHOLE WITH STANDARD RING AND COVER.



**CITY STANDARD ROADWAY MANHOLE RING & COVER CASTING DETAIL**

- ROADWAY MANHOLE RING & COVER NOTES**
- MANHOLE RING & COVER SHALL BE EAST JORDAN V 1168 ASSEMBLY AND FOR SCHOOL ZONE SHALL BE EAST JORDAN BOLTED-IN 1168 ASSEMBLY LOAD RATING HEAVY DUTY.
  - THESE DETAILS SHOW GRAY-IRON CASTINGS, FILED AT ANGLES WITH SHARP AND PERFECT ARISES.
  - CASTING SHALL BE TRUE TO PATTERN, FORM, AND DIMENSIONS, FREE FROM CRACKS, SPONGINESS AND BLOWHOLES.
  - MACHINE SURFACES TO YIELD FIT WHICH WILL NOT RATTLE WITH PASSING TRAFFIC LOAD.
  - TRAFFIC SHALL BE RESTRICTED FROM M.H. FOR 36 HOURS AFTER PLACEMENT OF RING.
  - RING AND COVER SHALL BE DIPPED IN COAL TAR OR ASPHALT.
  - OTHER CASTING PATTERNS FOR RING & COVERS MAY BE SUBMITTED FOR APPROVAL PROVIDED THE PLAN PATTERN OF COVER IS THE SAME AS SHOWN ON THIS SHEET AND PROVIDED OTHER CASTINGS SHALL BE COMPLETELY INTERCHANGEABLE, I.E., THE COVERS OF THIS SHEET SHALL FIT PROPERLY, THE RINGS OF OTHER CASTING DETAILS AND THE COVERS OF OTHER CASTINGS SHALL FIT THE RINGS OF THIS SHEET.
  - MINIMUM WEIGHTS OF FINISHED CASTINGS: THE COVER = 160 POUNDS, THE RING = 180 POUNDS.
  - POLYETHYLENE MANHOLE ADJUSTMENT RINGS SHALL BE DESIGNED TO SUPPORT H-20 TRAFFIC LOADING, TO SUPPORT H-20 TRAFFIC LOADING.



**TRENCH BACKFILL AND PAVEMENT REPAIR FOR STORM WATER LINES**

**GENERAL NOTES FOR BACKFILL**

TABLE 1 BEDDING AND INITIAL BACKFILL (BELOW PIPE TO 12" ABOVE PIPE)	TABLE 2 FINAL BACKFILL (GREATER THAN 12" ABOVE PIPE)																								
<p>ALL BEDDING AND INITIAL BACKFILL SHALL CONSIST OF GRANULAR MATERIAL CONSISTING OF EITHER NATURAL SAND OR SANDY GRAVEL, OR MATERIAL PRODUCED BY CRUSHING OF NATURAL STONE OR GRAVEL.</p> <p>SEWER LINES:</p> <ol style="list-style-type: none"> <li>EXCAVATIONS &lt;20FT. DEEP AND ABOVE WATER TABLE, USE MATERIAL MEETING THE FOLLOWING CRITERIA.</li> </ol> <p>MEETING REQUIREMENTS OF ASTM D2487 FOR:</p> <table border="0"> <tr> <td>SP</td> <td>GP</td> </tr> <tr> <td>SW</td> <td>GW</td> </tr> <tr> <td>SP-SM</td> <td>GP-GM</td> </tr> <tr> <td>SW-SM</td> <td>GW-GM</td> </tr> </table> <p>AND IN ADDITION:</p> <ul style="list-style-type: none"> <li>PASSING 1/2" SIEVE - 100%</li> <li>PASSING #4 SIEVE - 30% MINIMUM</li> <li>PLASTICITY INDEX (PI) - NP TO 10 MAX.</li> </ul> <ol style="list-style-type: none"> <li>IN DEEP EXCAVATIONS (&gt;20') OR BELOW WATER TABLE, USE CRUSHED STONE OR CRUSHED GRAVEL MEETING GRADATION OF:</li> </ol> <table border="0"> <tr> <td>A. CONCRETE COARSE AGGREGATE; TxDOT ITEM 421; GRADE 2, 3, OR 4.</td> </tr> </table> <p>WATER LINES:</p> <ol style="list-style-type: none"> <li>FOR WATER PIPE EMBEDMENT, USE THE FOLLOWING:</li> </ol> <table border="0"> <tr> <td>SP OR SW, (SAND WITH UP TO 12% ALLOWABLE PASSING #200 SIEVE).</td> </tr> </table> <p>AND IN ADDITION:</p> <ul style="list-style-type: none"> <li>PASSING #8 SIEVE - 100%</li> <li>PASSING #16 SIEVE - 70%</li> </ul> <p>FOR ALL UTILITIES:</p> <ol style="list-style-type: none"> <li>FOR PIPE DIAMETER EQUAL TO OR SMALLER THAN 16", USE 4" MINIMUM BEDDING UNDER PIPE.</li> <li>FOR PIPE DIAMETER GREATER THAN 16", USE 6" MINIMUM BEDDING UNDER PIPE.</li> </ol>	SP	GP	SW	GW	SP-SM	GP-GM	SW-SM	GW-GM	A. CONCRETE COARSE AGGREGATE; TxDOT ITEM 421; GRADE 2, 3, OR 4.	SP OR SW, (SAND WITH UP TO 12% ALLOWABLE PASSING #200 SIEVE).	<p><b>UNPAVED AREAS</b></p> <p>A. FOR 12" ABOVE PIPE TO BOTTOM OF TOPSOIL BACKFILL SHALL BE APPROVED SELECT MATERIAL FROM THE EXCAVATION; OR IMPORTED MATERIAL; ALL TO BE FREE OF ROCKS, DEBRIS, OR ANY CLUMPS GREATER THAN 2" IN DIAMETER; LOOSE LIFTS TO BE PLACED 10" MAX.</p> <p>COMPACT MATERIAL TO 95% STD. PROCTOR (D698).</p> <p>MOISTURE TO BE ADJUSTED TO ± 3% OF OPTIMUM.</p> <p>MAGNETIC WARNING 12" ABOVE PIPE</p> <p>ALL BEDDING AND INITIAL BACKFILL SHALL CONSIST OF GRANULAR MATERIAL SEE TABLE 1 FOR ALL PIPE DIAMETER</p> <p>* FOR ALL UTILITIES</p> <p>* FOR PIPE DIAMETER EQUAL TO OR SMALLER THAN 16", USE 4" MINIMUM BEDDING UNDER PIPE. FOR PIPE DIAMETER GREATER THAN 16", USE 6" MINIMUM BEDDING UNDER PIPE.</p> <p><b>PAVED AREAS</b></p> <p>BACKFILL SHALL BE CEMENT STABILIZED SAND AND SHALL MEET THE FOLLOWING REQUIREMENTS: SEE TABLE 2- ITEM B</p> <p>BACKFILL SHALL BE SELECT MATERIAL FROM EXCAVATION OR TO BE IMPORTED MATERIAL AND SHALL MEET THE FOLLOWING:</p> <ul style="list-style-type: none"> <li>LL &lt; 35</li> <li>PI 8-20</li> <li>NO CLUMPS &gt; 2" DIA.</li> <li>MOISTURE -1 TO +3%</li> <li>COMPACT 95% D698 STD PROCTOR</li> <li>LOOSE LIFTS OF 10" MAX</li> <li>OR BE CEMENT STABILIZED SAND SEE TABLE 2- ITEM A</li> </ul> <p>LOOSE LIFTS OF 10" MAX OR IF SELECT MATERIAL FROM EXCAVATION DOES NOT MEET REQUIREMENTS, THEN USE CEMENT STABILIZED SAND SEE TABLE 2- ITEM B</p> <p>B. FOR 3' BELOW BOTTOM OF ROAD BASE TO BOTTOM OF ROAD BASE:</p> <p>BACKFILL SHALL BE CEMENT STABILIZED SAND AND SHALL MEET THE FOLLOWING REQUIREMENTS:</p> <p>SAND GRADATION:</p> <table border="1"> <thead> <tr> <th>% PASSING</th> <th></th> </tr> </thead> <tbody> <tr> <td>1/2"</td> <td>100%</td> </tr> <tr> <td>#4</td> <td>55-100</td> </tr> <tr> <td>#10</td> <td>40-100</td> </tr> <tr> <td>#40</td> <td>25-100</td> </tr> <tr> <td>#200</td> <td>10-20</td> </tr> <tr> <td>PI</td> <td>NP-10</td> </tr> </tbody> </table> <p>CEMENT = 6-7% BY WEIGHT; MINIMUM 100 PSI @ 48 HOURS.</p> <p>COMPACT TO 95% OF D588. MOISTURE TO BE ADJUSTED TO (+/-2%) OF OPTIMUM.</p>	% PASSING		1/2"	100%	#4	55-100	#10	40-100	#40	25-100	#200	10-20	PI	NP-10
SP	GP																								
SW	GW																								
SP-SM	GP-GM																								
SW-SM	GW-GM																								
A. CONCRETE COARSE AGGREGATE; TxDOT ITEM 421; GRADE 2, 3, OR 4.																									
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CITY OF CORPUS CHRISTI TEXAS  
STORM WATER DEPARTMENT  
Department of Engineering Services

TYPE A, B & C MANHOLES/  
TRENCH BACKFILL/PAVEMENT  
REPAIR/ROADWAY RING & COVER  
STANDARD STORM WATER  
DETAILS

REVISION NO. 06/05 R.S. ADDENDUM NO. 1

SHEET \_\_\_\_\_ of \_\_\_\_\_  
RECORD DRAWING NO. \_\_\_\_\_  
CITY PROJECT # \_\_\_\_\_



**Exhibit 10**

**Storm Water Pollution**

**Prevention Plan**

**POLLUTION PREVENTION PLAN**  
**NOTICE**

The design professional will prepare a Storm Water Prevention Plan (SWPP) for the project, as directed by the Director of Engineering Services. The plan will be prepared in accordance with current local, state and federal requirements, and will be in accordance with TPDES General Permit No. TXR150000 and EPA General Permit and will meet all of the requirements.

TXR150000 is a new general permit issued pursuant to Section 26.040 of the Texas Water Code and Section 402 of the Clean Water Act. The current TCEQ Construction Permit is the effective permit for construction, with the exception of oil and gas construction and any other facilities regulated by the Railroad Commission.

Following are included documents:

TCEQ:

- Notice of Intent Form and Instructions
- Notice of Termination Form and Instructions
- TCEQ Pamphlet

EPA:

- Notice of Intent Form and Instructions
- Notice of Termination Form and Instructions
- EPA Pamphlet



**Notice of Intent (NOI) for Storm Water Discharges Associated with Construction Activity under the TPDES General Permit**

**TCEQ Office Use Only**

TPDES Permit Number: TXR15|\_|\_|\_|\_|\_|\_|\_|

GIN Number: |\_|\_|\_|\_|\_|\_|\_|\_|

Fee Receipt No. \_\_\_\_\_

**IMPORTANT:**

- Use the attached **INSTRUCTIONS** when completing this form.
- After completing this form, use the attached **CUSTOMER CHECKLIST** to make certain all items are complete and accurate.
- Missing, illegible, or inaccurate items may delay final acknowledgment or coverage under the general permit.

**Application Fee:** You must submit the \$100 NOI Application Fee to TCEQ under separate cover (see instructions) using the attached Application Fee submittal form. (DO NOT SEND A COPY OF THE NOI WITH THE APPLICATION FEE SUBMITTAL FORM)

**Tell us how you paid for this fee:**

Check/Money Order No.:

Name Printed on Check:

**A. OPERATOR**

1. TCEQ Issued Customer Number (CN) (if available):

2. Legal Name (spelled exactly as filed with the Texas Secretary of State, County, or legal document that was used in forming the entity):

3. Mailing Address:

Suite No./Bldg.No.:

City:

State:

ZIP Code:

4. Phone No.: ( ) -

Extension:

5. FAX No.

E-mail Address:

6. Type of Operator:

Individual

Sole Proprietorship-D.B.A.

Partnership

Corporation

Federal Government

State Government

County Government

City Government

Other: \_\_\_\_\_

7. Independent Operator:

Yes

No

(If governmental entity or a subsidiary or part of a larger corporation, check "NO")

8. Number of Employees:

0-20;

21-100;

101-250;

251-500; or

501 or higher

9. Business Tax and Filing Numbers (*not applicable to Individuals, Government, General Partnerships, and Sole Proprietorship-D.B.A.*):

State Franchise Tax ID Number: \_\_\_\_\_ Federal Tax ID: \_\_\_\_\_

TX SOS Charter (filing) Number: \_\_\_\_\_ DUNS Number: \_\_\_\_\_ (If known)

**B. BILLING ADDRESS** (The Operator is responsible for paying the annual fee.)

**Same As Operator** (check if address is the same, then proceed with Section C.)

1. Billing Mailing Address:

Suite No./Bldg.No.:

City:

State:

ZIP Code:

2. Billing Contact (Attn or C/O):

3. Country Mailing Information (if outside USA) Territory:

Country Code:

Postal Code:

4. Phone No.: ( ) -

Extension:

5. FAX No.

E-mail Address:

<b>C. APPLICATION CONTACT</b> (If TCEQ needs additional information regarding this application, who should be contacted?)		
1. Name:	Title:	Company:
2. Phone No.: (      ) -	Extension:	
3. FAX No.	E-mail Address:	
<b>D. REGULATED ENTITY (RE) INFORMATION ON PROJECT OR SITE</b>		
1. TCEQ Issued RE Reference Number (RN) (if available):		
2. Name of Project or Site:		
3. Physical Address of Project or Site: (enter in spaces below)		
Street Number:	Street Name:	
City (nearest to the site):	ZIP Code (nearest to the site):	County (Counties if >1):
4. If no physical address (Street Number & Street Name), provide a written location access description that can be used for locating the site: (Ex.: 2 miles west from intersection of Hwy 290 & IH35 on Hwy 290 South)		
5. Latitude:	N	Longitude: W
6. Standard Industrial Classification (SIC) code:		
7. Describe the activity related to the need for this authorization at this site ( <i>do not repeat the SIC and NAICS code</i> ):		
8. Is the project/site located on Indian Country Lands? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, you must obtain authorization through EPA, Region VI.		
<b>E. SITE MAILING ADDRESS</b> (address for receiving mail at the site)		
<input checked="" type="checkbox"/> <b>Same As Operator</b> (check if address is the same, then proceed with Section F.)		
Mailing Address:	Suite No./Bldg.No.:	
City:	State:	ZIP Code:
<b>F. GENERAL CHARACTERISTICS</b>		
1. Has a Pollution Prevention Plan been prepared as required in the general permit? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No  If No, coverage may be denied as the PPP is required at the time the NOI is submitted to TCEQ.		
2. Provide the estimated area of land disturbed (to the nearest acre): _____ Acres		
3. Provide the name of the receiving water body (local stream, lake, drainage ditch), MS4 Operator (if applicable) and the segment number where storm water runoff will flow from the construction site.  MS4 Operator: _____ Receiving Water Body: _____ Segment: _____		

**G. CERTIFICATION**

I, \_\_\_\_\_  
*Typed or printed name* *Title (Required)*

certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

I further certify that I am authorized under 30 Texas Administrative Code §305.44 to sign and submit this document, and can provide documentation in proof of such authorization upon request.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_  
*(Use Blue Ink)*



## Notice of Intent (NOI) for Storm Water Discharges Associated with Construction Activity under the TPDES General Permit (TXR150000)

### General Information and Instructions

#### GENERAL

#### INFORMATION

##### Where to Send the Notice of Intent (NOI):

###### BY REGULAR U.S. MAIL

Texas Commission on Environmental Quality  
Storm Water & Pretreatment Team; MC-228  
P.O. Box 13087  
Austin, Texas 78711-3087

###### BY OVERNIGHT/EXPRESS MAIL

Texas Commission on Environmental Quality  
Storm Water & Pretreatment Team; MC-228  
12100 Park 35 Circle  
Austin, TX 78753

It is recommended that the NOI be mailed using a method that documents the date mailed.

##### TCEQ Contact list:

Application Processing Questions relating to the status and form requirements:	512/239-3700 & E-mail at "swpermit@tceq.state.tx.us"
Technical Questions relating to the general permit:	512/239-4671
Environmental Law Division:	512/239-0600
Central Records for obtaining copies of forms submitted to TCEQ:	512/239-0900
Information Services for obtaining reports from program data bases(as available):	512/239-DATA (3282)
Financial Administration's Cashier's office for receipt of payment:	512/239- 0357 or 512/239-0187

##### Notice of Intent Process:

When your NOI is received by the program, the form will be processed as follows:

- Administrative Review:** Each item on the form will be reviewed for a complete response. In addition, the operator's legal number must be verified with Texas Secretary of State as valid and active (when applicable). The address on the form must be verified with the US Postal service as an address receiving regular mail delivery (never give an overnight/express mailing address).
  - Notice of Deficiency:** If an item is incomplete or not verifiable as indicated above, a notice of deficiency (NOD) will be mailed to the operator. The operator will have 30 days to respond to the NOD. The response will be reviewed for completeness; and if complete,
  - Acknowledge Coverage:** We will mail an Acknowledgment Certificate to the operator. This certificate acknowledges coverage under the general permit.
- or-
- Denial of Coverage:** If the operator fails to respond to the NOD, we may deny coverage under the general permit. If coverage is denied, we will notify the operator.

##### General Permit (Your Permit)

Provisional coverage under the general permit begins two days following the date that the NOI was postmarked. You should have a copy of the general permit when submitting your application. You may view and print the general permit for which you are seeking coverage on the TCEQ web site [www.tceq.state.tx.us](http://www.tceq.state.tx.us).

##### General Permit Forms

The Notice of Intent and Notice of Termination forms (with instructions) are available in Adobe Acrobat PDF format on the TCEQ web site [www.tceq.state.tx.us](http://www.tceq.state.tx.us).

##### Change in Operator

An authorization under the general permit is not transferable. If the operator of the regulated entity changes, the present permittee must submit a Notice of Termination and the new operator must submit a Notice of Intent. The NOT and NOI must be submitted not later than 10 days prior to the change in operator status.

**Notice of Change**

A Notice of Change letter must be submitted with supplemental or corrected information within 14 days following the time when the operator becomes aware that it failed to submit any relevant facts or incorrect information in the NOI; or the time when relevant facts in the NOI change (i.e. addresses, or phone numbers).

**Notice of Termination**

A permittee shall terminate coverage under this general permit through the submittal of a NOT when the operator or owner of the facility changes, the discharge becomes authorized under an individual permit, or the use of the property changes and is no longer subject to regulation under this general permit.

**TCEQ Central Registry Core Data Form**

The Core Data Form has been incorporated into this form. Do not complete and attach a core data form when submitting this application. After final acknowledgment of coverage under the general permit, the program will transfer the core data to the agency Central Registry for assignment of a Customer Number and Regulated Entity Number. You can find this information on our web site at [www.tceq.state.tx.us](http://www.tceq.state.tx.us), where you can query the Central Registry under the regulated entity number, or by your permit number under the search field labeled "Additional ID".

**Fees are associated with a General Permit**

The general permit refers to two different fees that apply to operators required to submit a Notice of Intent (NOI). Payment of the fees may be made by check or money order, payable to TCEQ.

**BY REGULAR U.S. MAIL**

Texas Commission on Environmental Quality  
Financial Administration Division  
Cashier's Office, MC-214  
P.O. Box 13088  
Austin, TX 78711-3088

**BY OVERNIGHT/EXPRESS MAIL**

Texas Commission on Environmental Quality  
Financial Administration Division  
Cashier's Office, MC-214  
12100 Park 35 Circle  
Austin, TX 78753

**Application Fee:** This is a fee that is required to be paid at the time the NOI is submitted. Failure to submit the payment at the time the application is filed will cause delays in acknowledging coverage or denial of cover under the general permit. This payment must be submitted separately using the Payment Submittal Form. If submitting one check or money order for multiple NOI's, list each site name and location exactly as provided on the NOI.

**Annual Water Quality Fee:** This is a fee that is assessed to operators with an active authorization under the general permit on September 1 of each year. The operator will receive an invoice for payment of the annual fee in November of each year. The payment will be due 30 days from the invoice date. A 5% penalty will be assessed if the payment is received by TCEQ after the due date. Annual fee assessments cannot be waived as long as the authorization under the general permit is active on September 1. It's important for the operator to submit a Notice of Termination (NOT) when coverage under the general permit is no longer required. A NOT is effective on the postmarked date of mailing the form to TCEQ. It is recommended that the NOT be mailed using a method that documents the date mailed.

## INSTRUCTIONS FOR FILLING OUT THE FORM

**A. OPERATOR** (As defined in the general permit.)**1. TCEQ Issued Customer Number (CN)**

TCEQ's Central Registry will assign each customer a number that begins with "CN," followed by nine digits. **This is not a permit number, registration number, or license number.**

- If this customer has not been assigned a Customer Reference Number, leave the space for the Customer Reference Number blank.
- If this customer has already been assigned this number, enter the operator's Customer Reference Number in the space provided.

**2. Legal Name**

Provide the legal name of the facility operator, as authorized to do business in Texas. The name must be provided exactly as filed with the Texas Secretary of State(SOS), or on other legal document forming the entity that is filed in the county where doing business. You may contact the SOS at 512/463-5555, for more information related to filing in Texas. If filed in the county where doing business, provide a copy of the legal documents showing the legal name.

### 3. Operator Mailing Address

Provide a complete mailing address for this customer to receive mail from the TCEQ. The address must be verifiable with the US Postal Service at [www.usps.com](http://www.usps.com), for regular mail delivery (not overnight express mail). If you find that the address is not verifiable using the USPS web search, please indicate the address is used by the USPS for regular mail delivery.

If this is a street address, please follow US Postal Service standards. In brief, these standards require this information in this order:

- the "house" number—for example, the 1401 in  
1401 Main St
- if there is a direction before the street name, the one- or two-letter abbreviation of that direction (N, S, E, W, NE, SE, SW, or NW)
- the street name (if a numbered street, do not spell out the number—for example, 6th St, not Sixth St)
- an appropriate abbreviation of the type of street—for example, St, Ave, Blvd, Fwy, Exwy, Hwy, Cr, Ct, Ln
- if there is a direction after the street name, the one- or two-letter abbreviation of that direction (N, S, E, W, NE, SE, SW, or NW)
- if there is a room number, suite number, or company mail code

### City, State, and ZIP Code

Enter the name of the city, the two-letter USPS abbreviation for the state (for example, TX), and the ZIP Code. (Enter the full ZIP+4 if you know it.)

### Country Mailing Information

If this address is *outside* the United States, enter the territory name, country code, and any non-ZIP mailing codes or other non-U.S. Postal Service features here. If this address is *inside* the United States, leave these spaces blank.

### Operator Electronic Communications

#### 4. Phone Number

This number should correspond to this customer's mailing address given earlier. Enter the area code and phone number here. Leave "Extension" blank if this customer's phone system lacks this feature.

#### 5. Fax Number and E-mail Address

This number and E-mail address should correspond to operator's mailing address given earlier. (Optional Information)

#### 6. Type of Operator

Check only one box that identifies the type of entity. Use the descriptions below to identify the appropriate entity type:

Individual	is a person and has not established a business to do whatever causes them to be regulated by us.
Sole Proprietorship— D.B.A.	is a business that is owned by only one person and has not been incorporated. This business may: <ul style="list-style-type: none"><li>• be under the person's name</li><li>• have its own name ("doing business as," or d.b.a.)</li><li>• have any number of employees</li></ul>
Partnership	is a business that is established as a partnership as defined by the Texas Secretary of State's Office.
Corporation	meets all of these conditions: <ul style="list-style-type: none"><li>• is a legally incorporated entity under the laws of any state or country</li><li>• is recognized as a corporation by the Texas Secretary of State</li><li>• has proper operating authority to operate in Texas.</li></ul>
Federal, state, county, or city government (as appropriate)	is either an agency of one of these levels of government or the governmental body itself.
Other	fits none of the above descriptions. Enter a short description of the type of customer in the blank provided.

#### 7. Independent Operator

Check "No" if this customer is a subsidiary, part of a larger company, or is a governmental entity. Otherwise, check "Yes."

#### 8. Number of Employees

Check one box to show the number of employees for this customer's entire company, at all locations. This is not necessarily the number of employees at the site named in this NOI.



<b>9. State Franchise Tax ID Number</b>	Corporations and limited liability companies that operate in Texas are issued a franchise tax identification number. If this customer is a corporation or limited liability company, enter this number here.
<b>Federal Tax ID</b>	All businesses, except for some small sole proprietors, should have a federal taxpayer identification number (TIN). Enter this number here. Use no prefixes, dashes, or hyphens. Individuals and sole proprietors do not need to provide a federal tax ID.
<b>TX SOS Charter (filing) Number</b>	Corporations and Limited Partnerships required to register with the Texas Secretary of State are issued a charter or filing number. You may obtain further information by calling SOS at 512/463-5555 or <a href="http://www.sos.state.tx.us">www.sos.state.tx.us</a>
<b>DUNS Number</b>	Most businesses have a DUNS (Data Universal Numbering System) number issued by Dun and Bradstreet Corp. If this customer has one, enter it here.
<b>B. BILLING ADDRESS</b>	
An annual fee is assessed to an operator holding an active authorization under the general permit September 1 of each year. Provide the complete mailing address where the annual fee invoice should be mailed. Verify the address with the USPS ensuring it to be an address for delivery of regular mail (not overnight express mail). Also, provide a phone number of the office responsible for payment of the invoice. The operator is the responsible billing client for payment of annual fee.	
<b>C. APPLICATION CONTACT</b>	
Provide the name, title and communication information of the person that TCEQ can contact for additional information regarding this application.	
<b>D. REGULATED ENTITY (RE) INFORMATION ON PROJECT OR SITE</b>	
<b>1. Regulated Entity Reference Number (RN)</b>	
This is a number issued by TCEQ's Central Registry to sites regulated by TCEQ (a location where a regulated activity occurs). <b>This is not a permit number, registration number, or license number.</b>	
<ul style="list-style-type: none"> <li>• If this Regulated Entity has not been assigned a Regulated Entity Number, leave the space for the Regulated Entity Number blank.</li> <li>• If this customer has already been assigned this number, enter the operator's Regulated Entity Number.</li> </ul>	
<b>2. Site/Project Name/Regulated Entity</b>	
Provide the name of the site as known by the public in the area where the site is located. The name you provide on this application will be used in the TCEQ Central Registry as the Regulated Entity. A regulated entity number will be assigned by Central Registry, if this is a new site (not currently regulated by TCEQ).	
<b>3. Site/Project (RE) Physical Address</b>	
Enter the complete address of where the site is located. This address must be validated through US Postal Service or your local police (911 service) as a valid address. Please confirm this to be a complete and valid address. In some rural areas, new addresses are being assigned to replace rural route addresses. <b>Please do not use a rural route or post office box for a site location.</b>	
Provide the county, city and ZIP code of the area where the project/site is located. This information is required to complete the processing of your form.	
<b>4. No Physical Address</b>	
If a site does not have an actual physical address that includes a street (or house) number and street name, enter NO ADDRESS for the street name. Then provide a complete written location access description. <i>For example:</i> "The site is located 2 miles west from intersection of Hwy 290 & IH35, locate on the southwest corner of the Hwy 290 South bound lane."	
For projects/sites that includes a large project area, describe the project. <i>For example:</i> "State Highway 45 road project between Highway 620 and IH 35."	

**5. Latitude and Longitude**

Enter the latitude and longitude of the site in either degrees, minutes, and seconds or decimal form. For help obtaining the latitude and longitude, go to: <http://www.tnrce.state.tx.us/gis/drgview.html> or [www.teraserver.microsoft.com/advfind.aspx](http://www.teraserver.microsoft.com/advfind.aspx).

**6. Standard Industrial Classification (SIC) code**

Provide the SIC code that best describes the activity being conducted at the site.

Common SIC Codes related to construction activities include: 1521 Construction of Single Family Homes; 1522 Construction of Residential Bldgs. Other than Single Family Homes; 1541 Construction of Industrial Bldgs. and Warehouses; 1542 Construction of Non-residential Bldgs. other than Industrial Bldgs. and Warehouses; 1611 Highway & Street Construction, except Highway Construction; 1622 Bridge, Tunnel, & Elevated Highway Construction; 1623 Water, Sewer, Pipeline & Communications, and Power Line Construction.

For help with SIC codes, go to: <http://www.osha.gov/oshstats/sicscr.html>

**7. Description of Activity Regulated**

Provide a description of the activity being conducted at the site. This must be a description specific to what you are doing that requires this authorization. (Do not repeat the SIC Code)

**8. Indian Country Lands**

If your site is located on Indian Country Lands, the TCEQ does not have authority to process your application. You must obtain authorization through EPA, Region VI, Dallas. **Do not submit this form to TCEQ.**

**E. SITE MAILING ADDRESS**

Provide a complete mailing address to be used by TCEQ for receiving mail at the site. In most cases, the address is the same as the operator. If so, simply place a check mark in the box. If you provide a different address, please verify the address with USPS as noted above for the operator address.

**F. GENERAL CHARACTERISTICS**

**1. Pollution Prevention Plan (PPP)**

This plan identifies the areas and activities that could produce contaminated runoff at your site and then tells how you will ensure that this contamination is mitigated. For example, in describing your mitigation measures, your site's plan might identify the devices that collect and filter storm water, tell how those devices are to be maintained, and tell how frequently that maintenance is to be carried out. **You must develop this plan in accordance with the TCEQ general permit requirements. This plan must be developed and implemented before you complete this NOI.** This plan must be available for a TCEQ investigator to review on request.

**2. Estimated Area of Land Disturbed**

Provide the approximate number of acres that the construction site will disturb. Construction activities that disturb less than one acres, unless they are part of a larger common plan that disturbs more than one acre, do not require permit coverage. Construction activities that disturb between one and five acres, unless they are part of a common plan that disturbs more than five acres, do not require submission of an NOI. Therefore, the estimated area of land disturbed should not be less than five, unless the project is part of a larger common plan that disturbs five or more acres. If the acreage is less than 1, enter 1. "Disturb" means any clearing, grading, excavating, or other similar activities. If you have any questions about this item, please call the storm water technical staff at (512)239-4671.

**3. Receiving Water Body**

The storm water from your site eventually reaches a receiving water body such as a local stream or lake, possibly via a drainage ditch. The discharge may initially be into a municipal separate storm sewer system (MS4). If applicable, provide the name of the entity that operates the MS4 where the storm water discharges. An MS4 operator is often a city, town, or utility district, but possibly another form of government.

You must provide the name of the water body that receives the discharge from the construction site (a local stream or lake). Storm water may be discharged directly to a receiving stream or through a MS4. If known, please include the segment number if the discharge is to a classified water body.

### G. OPERATOR CERTIFICATION

The certification must bear an original signature of a person meeting the signatory requirements specified in under 30 Texas Administrative Code (TAC) §305.44. The printed name and title of the person signing the form must be provided. NOI forms with stamped or copied signatures will not be processed.

#### IF YOU ARE A CORPORATION:

The regulation that controls who may sign an NOI or similar form is 30 Texas Administrative Code §305.44(a)(1) (see below). According to this code provision, any corporate representative may sign an NOI or similar form so long as the authority to sign such a document has been delegated to that person in accordance with corporate procedures. By signing the NOI or similar form, you are certifying that such authority has been delegated to you. The TCEQ may request documentation evidencing such authority.

#### IF YOU ARE A MUNICIPALITY OR OTHER GOVERNMENT ENTITY:

The regulation that controls who may sign an NOI or similar form is 30 Texas Administrative Code §305.44(a)(3) (see below). According to this code provision, only a ranking elected official or principal executive officer may sign an NOI or similar form. Persons such as the City Mayor or County Commissioner will be considered ranking elected officials. In order to identify the principal executive officer of your government entity, it may be beneficial to consult your city charter, county or city ordinances, or the Texas statute(s) under which your government entity was formed. An NOI or similar document that is signed by a government official who is not a ranking elected official or principal executive officer does not conform to §305.44(a)(3). The signatory requirement may not be delegated to a government representative other than those identified in the regulation. By signing the NOI or similar form, you are certifying that you are either a ranking elected official or principal executive officer as required by the administrative code. Documentation demonstrating your position as a ranking elected official or principal executive officer may be requested by the TCEQ.

If you have any questions or need additional information concerning the signatory requirements discussed above, please contact the Texas Commission on Environmental Quality's Environmental Law Division at 512/239-0600.

### 30 Texas Administrative Code

#### §305.44. Signatories to Applications.

(a) All applications shall be signed as follows.

(1) For a corporation, the application shall be signed by a responsible corporate officer. For purposes of this paragraph, a responsible corporate officer means a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding \$25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures. Corporate procedures governing authority to sign permit or post-closure order applications may provide for assignment or delegation to applicable corporate positions rather than to specific individuals.

(2) For a partnership or sole proprietorship, the application shall be signed by a general partner or the proprietor, respectively.

(3) For a municipality, state, federal, or other public agency, the application shall be signed by either a principal executive officer or a ranking elected official. For purposes of this paragraph, a principal executive officer of a federal agency includes the chief executive officer of the agency, or a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., regional administrator of the EPA).

**Texas Commission on Environmental Quality  
General Permit Payment Submittal Form**

Use this form to submit your Application Fee.

- Complete items 1 through 4 below:
- Staple your check in the space provided at the bottom of this document.
- Do not mail this form with your NOI form.
- Do not mail this form to the same address as your NOI. Instead, mail this form and your check to:

**BY REGULAR U.S. MAIL**

Texas Commission on Environmental Quality  
Financial Administration Division  
Cashier's Office, MC-214  
P.O. Box 13088  
Austin, TX 78711-3088

**BY OVERNIGHT/EXPRESS MAIL**

Texas Commission on Environmental Quality  
Financial Administration Division  
Cashier's Office, MC-214  
12100 Park 35 Circle  
Austin, TX 78753

To confirm receipt of payment, call the Cashier's office at 512/239- 0357 or 239-0187.

Fee Code: **GPA**

General Permit: **TXR150000**

1. Check / Money Order No:

2. Amount of Check/Money Order:

3. Date of Check or Money Order:

4. Name on Check or Money Order:

**5. NOI INFORMATION**

If the check is for more than one NOI, list each Project/Site (RE) Name and Physical Address exactly as provided on the NOI. **DO NOT SUBMIT A COPY OF THE NOI WITH THIS FORM AS IT COULD CAUSE DUPLICATE PERMIT ENTRIES.**

See Attached List of Sites *(If more space is needed, you may attach a list.)*

Project/Site (RE) Name:

Project/Site (RE) Physical Address:

**Staple Check In This Space**

Did you complete everything? Use this checklist to be sure!

Are you ready to mail your form to TCEQ? Go to the General Information Section of the Instructions for mailing addresses.

Have you also mailed your check and Payment Submittal Form to the Cashier's office? Go to the end of this document for the Payment Submittal Form.

Customer GP TXR150000 Notice of Intent Checklist	
√	This checklist is for use by the operator to ensure a complete application. Missing information may result in denial of coverage under the general permit. (See NOI Process description in the Instructions)
<input type="checkbox"/>	Application Fee was sent to TCEQ's Financial Administration and the check information is listed.
	<p><b>OPERATOR INFORMATION</b> - Confirm each item is complete:</p> <p>√</p> <p><input type="checkbox"/> Customer Number issued by TCEQ Central Registry (if you have it)</p> <p><input type="checkbox"/> Legal Name as filed to do business in Texas (Call TX SOS 512/463-5555)</p> <p><input type="checkbox"/> Operator Mailing Address is complete &amp; verifiable with USPS. <a href="http://www.usps.com">www.usps.com</a></p> <p><input type="checkbox"/> Phone Numbers/E-mail</p> <p><input type="checkbox"/> Type of Operator (Entity Type)</p> <p><input type="checkbox"/> Independent Operator</p> <p><input type="checkbox"/> Number of Employees</p> <p><input type="checkbox"/> For Corporations or Limited Partnerships - Tax and Filing numbers</p>
<input type="checkbox"/>	<b>Billing Address</b> is complete & verifiable with USPS. <a href="http://www.usps.com">www.usps.com</a>
<input type="checkbox"/>	<b>Application Contact</b> - a contact person for TCEQ to call is listed
	<p><b>REGULATED ENTITY (RE) INFORMATION</b> - Confirm each item is complete:</p> <p>√</p> <p><input type="checkbox"/> Regulated Entity Reference Number (RN) (if you have it)</p> <p><input type="checkbox"/> Site/Project Name/Regulated Entity</p> <p><input type="checkbox"/> Site/Project (RE) Physical Address <b>Please do not use a rural route or post office box for a site location</b></p> <p><input type="checkbox"/> Latitude and Longitude <a href="http://www.tnrcc.state.tx.us/gis/drgview.html">http://www.tnrcc.state.tx.us/gis/drgview.html</a> or <a href="http://www.terraserver.microsoft.com/advfind.aspx">www.terraserver.microsoft.com/advfind.aspx</a></p> <p><input type="checkbox"/> Standard Industrial Classification (SIC) code <a href="http://www.osha.gov/oshstats/sieser.html">http://www.osha.gov/oshstats/sieser.html</a> and business description</p> <p><input type="checkbox"/> Indian Country Lands - your answer was NO</p> <p><input type="checkbox"/> Site Mailing Address (checked same as operator or gave a complete &amp; verifiable with USPS. <a href="http://www.usps.com">www.usps.com</a>)</p>
	<p><b>GENERAL CHARACTERISTICS</b> - Confirm each item is complete:</p> <p>√</p> <p><input type="checkbox"/> Pollution Prevention Plan (PPP) must be "Yes"</p> <p><input type="checkbox"/> Area of Land Disturbed (nearest acre)</p> <p><input type="checkbox"/> MS4 Operator, Receiving Water Body or Segment</p>
<input type="checkbox"/>	<p><b>CERTIFICATION</b></p> <p>Signature meets 30 Texas Administrative Code (TAC) §305.44 and is original.</p>



**Notice of Termination (NOT) for Storm Water Discharges Associated with Construction Activity under the TPDES Construction General Permit (TXR150000)**

**TCEQ Office Use Only**

TPDES Permit Number: TXR15|\_|\_|\_|\_| - NO

GIN Number: |\_|\_|\_|\_|\_|\_|\_|\_|

For help completing this application, read the TXR150000 NOI Instructions ([TCEQ-20023-Instructions](#)).

**A. TPDES Permit Number:** TXR15\_\_\_\_\_

**B. Construction Site Operator**

Customer Reference Number: CN\_\_\_\_\_

Name: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

City: \_\_\_\_\_ State: -- \_\_\_\_\_ Zip Code: \_\_\_\_\_

Country Mailing Information (if outside USA) Territory: \_\_\_\_\_ Country Code: \_\_\_\_\_ Postal Code: \_\_\_\_\_

Phone Number: \_\_\_\_\_ Extension: \_\_\_\_\_ Fax Number: \_\_\_\_\_

E-mail Address: \_\_\_\_\_

**C. Project / Site Information**

Regulated Entity Reference Number: RN\_\_\_\_\_

Name: \_\_\_\_\_

Physical Address: \_\_\_\_\_

Location Access Description: \_\_\_\_\_

City: \_\_\_\_\_ County: -- \_\_\_\_\_ Zip Code: \_\_\_\_\_

**D. Contact - If the TCEQ needs additional information regarding this termination, who should be contacted?**

Name: \_\_\_\_\_ Title: \_\_\_\_\_

Phone Number: \_\_\_\_\_ Extension: \_\_\_\_\_ Fax Number: \_\_\_\_\_

E-mail Address: \_\_\_\_\_

**E. Certification**

I certify under penalty of law that authorization under the TPDES Construction General Permit (TXR150000) is no longer necessary based on the provisions of the general permit. I understand that by submitting this Notice of Termination, I am no longer authorized to discharge storm water associated with construction activity under the general permit TXR150000, and that discharging pollutants in storm water associated with construction activity to waters of the U.S. is unlawful under the Clean Water Act where the discharge is not authorized by a TPDES permit. I also understand that the submittal of this Notice of Termination does not release an operator from liability for any violations of this permit or the Clean Water Act.

**Construction Site Operator Representative:**

Prefix: \_\_\_\_\_ First: \_\_\_\_\_ Middle: \_\_\_\_\_

Last: \_\_\_\_\_ Suffix: \_\_\_\_\_

Title: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

If you have questions on how to fill out this form or about the storm water program, please contact us at (512) 239-4671. Individuals are entitled to request and review their personal information that the agency gathers on its forms. They may also have any errors in their information corrected. To review such information, contact us at (512) 239-3282.

The completed NOT must be mailed to the following address:

**Texas Commission on Environmental Quality  
Storm Water & General Permits Team; MC - 228  
P.O. Box 13087  
Austin, Texas 78711-3087**

# Completing the Notice of Termination for Storm Water Discharges Associated with Construction Activity under the TPDES Construction General Permit (TXR150000)

## Who May File a Notice of Termination (NOT) Form

Permittees disturbing 5 acres or more (or part of a larger common plan of development or sale disturbing 5 acres or more) who are presently covered under the Texas Pollutant Discharge Elimination System (TPDES) Construction General Permit must submit a Notice of Termination (NOT) when final stabilization has been achieved on all portions of the site that is the responsibility of the permittee; or another permitted operator has assumed control over all areas of the site that have not been finally stabilized and all silt fences and other temporary erosion controls have either been removed, scheduled for removal as defined in the SWP3, or transferred to a new operator if the new operator has sought permit coverage. Erosion controls that are designed to remain in place for an indefinite period, such as mulches and fiber mats, are not required to be removed or scheduled for removal.

**Final Stabilization** occurs when either of the following conditions are met:

- (a) All soil disturbing activities at the site have been completed and a uniform (e.g. evenly distributed, without large bare areas) perennial vegetative cover with a density of 70% of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or equivalent permanent stabilization measures (such as the use of riprap, gabions, or goetextiles) have been employed.
- (b) For individual lots in a residential construction site by either:
  - (1) the homebuilder completing final stabilization as specified in condition (a) above; or
  - (2) the homebuilder establishing temporary stabilization for an individual lot prior to the time of transfer of the ownership of the home to the buyer and after informing the homeowner of the need for, and benefits of, final stabilization.
- (c) For construction activities on land used for agricultural purposes (e.g. pipelines across crop or range land), final stabilization may be accomplished by returning the disturbed land to its preconstruction agricultural use. Areas disturbed that were not previously used for agricultural activities, such as buffer strips immediately adjacent to a surface water and areas which are not being returned to their preconstruction agricultural use must meet the final stabilization conditions of condition (a) above.

## A. TPDES Permit Number

Provide the TPDES permit number assigned to the operator of the construction site.

## B. Construction Site Operator Information

### Customer Reference Number

This number designates the operator's status as a TCEQ "customer"—in other words, an individual or business that is involved in an activity that we regulate. We assign each customer a number that begins with "CN," followed by nine digits. **This is not a permit number, registration number, or license number.** In the remainder of this section, we will use "this customer" to mean the operator for Part B of the form.

- If this customer has not been assigned a Customer Reference Number, leave the space for the Customer Reference Number blank.
- If this customer has already been assigned this number, enter the operator's Customer Reference Number.
- **Do not enter a permit number, registration number, or license number in place of the Customer Reference Number.**

### Name

Enter the legal name of this customer as authorized to do business in Texas. Include any abbreviations (LLC, Inc., etc.).

### Mailing Address

Enter a central and general mailing address for this customer to receive mail from the TCEQ. For example, if this customer is a large company, this address might be the corporate or regional headquarters. On the other hand, for a smaller business, this address could be the same as the site address.

**If this is a street address, please follow US Postal Service standards.** In brief, these standards require this information in this order:

- the "house" number—for example, the 1401 in 1401 Main St
- if there is a direction before the street name, the one- or two-letter abbreviation of that direction (N, S, E, W, NE, SE, SW, or NW)
- the street name (if a numbered street, do not spell out the number—for example, 6th St, not Sixth St)
- an appropriate abbreviation of the type of street—for example, St, Ave, Blvd, Fwy, Exwy, Hwy, Cr, Ct, Ln
- if there is a direction after the street name, the one- or two-letter abbreviation of that direction (N, S, E, W, NE, SE, SW, or NW)
- if there is a room number, suite number, or company mail code

### City, State, and ZIP Code

Enter the name of the city, the two-letter USPS abbreviation for the state (for example, TX), and the ZIP Code. (Enter the full ZIP+4 if you know it.)

### Country Mailing Information

If this address is **outside** the United States, enter the territory name, country code, and any non-ZIP mailing codes or other non-U.S. Postal Service features here. If this address is **inside** the United States, leave these spaces blank.

### Phone Number and Extension

This number should correspond to this customer's mailing address given earlier. Enter the area code and phone number here. Leave "Extension" blank if this customer's phone system lacks this feature.

### Fax Number

This number should correspond to this customer's mailing address given earlier. Enter the area code and fax number here.

### E-mail Address

As with the mailing address, this should be a general address that is appropriate for e-mail to this customer's central or regional headquarters, if applicable.

## C. Project / Site Information

### Regulated Entity Reference Number

This number designates this site's status as a TCEQ "regulated entity"—in other words, a location where an activity that we regulate occurs. We assign each regulated entity a number that begins with "RN," followed by nine digits. ***This is not a permit number, registration number, or license number.***

- If this site has not been assigned a Regulated Entity Reference Number, leave the space for the Regulated Entity Reference Number blank.
- If this site has already been assigned this number, enter the Regulated Entity Reference Number.
- ***Do not enter a permit number, registration number, or license number in place of the Regulated Entity Reference Number.***

### Name

Enter the name by which you want this site to be known to the TCEQ.

### Physical Address

Enter the physical address of the site itself. TCEQ staff should be able to use this address to find the site.

### Location Description

Enter a physical description of the location of the site based on highway intersections and/or permanent landmarks.

### City, County, and ZIP Code

Enter the name of the city, the county, and the ZIP Code. (Enter the full ZIP+4 if you know it.)

## D. Contact

Give all the relevant information for the person whom TCEQ can contact if there are questions about any of the information on this form—perhaps the same person who completed the form.

## E. Certification

The operator must sign and date this statement to validate this NOI. Be sure to enter the full legal name of the person signing the form and the relevant title—for example, "Operator," "Operator's attorney," or "Senior Site Manager." Use the "Prefix" blank for such titles as Dr., Mr., or Ms., as desired. Use the "Suffix" blank for such designations as Ph.D., Jr., Sr., III, or J.D., if applicable.

For a corporation, the application shall be signed by a responsible corporate officer. A responsible corporate officer means a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding \$25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures. Corporate procedures governing authority to sign permit applications may provide for assignment or delegation to applicable corporate positions rather than to specific individuals.

For a partnership or sole proprietorship, the application shall be signed by a general partner or the proprietor, respectively.

For a municipality, state, federal, or other public agency, the application shall be signed by either a principal executive officer or a ranking elected official. For purposes of this application, a principal executive officer of a federal agency includes the chief executive officer of the agency, or a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g. regional administrator of the United States Environmental Protection Agency).

## Questions?

If you have questions about any of the information on this form, contact our Storm Water Program at 512/239-4671 or look for "Storm Water" on our Web site:

[www.tceq.state.tx.us](http://www.tceq.state.tx.us)





TPDES General Permit  
NO. TXR150000

This is a new general permit  
issued pursuant to Section  
26.040 of the Texas Water Code  
and Section 402 of the Clean  
Water Act.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY  
P.O. BOX 13087  
Austin, TX 78711-3087

GENERAL PERMIT TO DISCHARGE WASTE

under provisions of  
Section 402 of the Clean Water Act  
and Chapter 26 of the Texas Water Code

Construction sites located in the state of Texas

may discharge to surface water in the state

only according to effluent limitations, monitoring requirements and other conditions set forth in this permit, as well as the rules of the Texas Commission on Environmental Quality (TCEQ), the laws of the State of Texas, and other orders of the TCEQ. The issuance of this general permit does not grant to the permittee the right to use private or public property for conveyance of storm water and certain non-storm water discharges along the discharge route. This includes property belonging to but not limited to any individual, partnership, corporation or other entity. Neither does this permit authorize any invasion of personal rights nor any violation of federal, state, or local laws or regulations. It is the responsibility of the permittee to acquire property rights as may be necessary to use the discharge route.

This permit and the authorization contained herein shall expire at midnight five years after the date of issuance.

ISSUED AND EFFECTIVE DATE: MAR 05 2003

  
\_\_\_\_\_  
For the Commission

**TCEQ General Permit Number TXR150000 Relating To Discharges  
From Construction Activities**

**Table of Contents**

Part I.	Definitions .....	Page 3
Part II.	Permit Applicability and Coverage .....	Page 7
Part III.	Storm Water Pollution Prevention Plans .....	Page 18
Part IV.	Numeric Effluent Limitations .....	Page 28
Part V.	Retention of Records .....	Page 29
Part VI.	Standard Permit Conditions .....	Page 29
Part VII.	Fees .....	Page 30
Appendix A.	Periods of Low Potential by County .....	Page 31
Attachment 1	Construction Site Notice for Part II.D.1 Waivers .....	Page 32
Attachment 2	Construction Site Notice for Part II.D.2. Authorizations .....	Page 33
Attachment 3	Discharge Monitoring Report for Concrete Batch Plants .....	Page 34

## Part I. Definitions

**Best Management Practices - (BMPs)** Schedules of activities, prohibitions of practices, maintenance procedures, structural controls, local ordinances, and other management practices to prevent or reduce the discharge of pollutants. BMPs also include treatment requirements, operating procedures, and practices to control construction site runoff, spills or leaks, waste disposal, or drainage from raw material storage areas.

**Commencement of Construction -** The exposure of soils resulting from activities such as clearing, grading, and excavating.

**Common Plan of Development -** A construction activity that is completed in separate stages, separate phases, or in combination with other construction activities. A common plan of development is identified by the documentation for the construction project that identifies the scope of the project, and may include plats, blueprints, marketing plans, contracts, building permits, a public notice or hearing, zoning requests, or other similar documentation and activities.

**Facility or Activity -** Any TPDES “point source” or any other facility or activity (including land or appurtenances thereto) that is subject to regulation under the TPDES program.

**Final Stabilization -** A construction site status where either of the following conditions are met:

- (a) All soil disturbing activities at the site have been completed and a uniform (e.g. evenly distributed, without large bare areas) perennial vegetative cover with a density of 70% of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.
- (b) For individual lots in a residential construction site by either:
  - (1) the homebuilder completing final stabilization as specified in condition (a) above; or
  - (2) the homebuilder establishing temporary stabilization for an individual lot prior to the time of transfer of the ownership of the home to the buyer and after informing the homeowner of the need for, and benefits of, final stabilization.
- (c) For construction activities on land used for agricultural purposes (e.g. pipelines across crop or range land), final stabilization may be accomplished by returning the disturbed land to its preconstruction agricultural use. Areas disturbed that were not previously used for agricultural activities, such as buffer strips immediately adjacent to a surface water and areas which are not being returned to their preconstruction agricultural use must meet the final stabilization conditions of condition (a) above.

**Large Construction Activity** - Construction activities including clearing, grading, and excavating that result in land disturbance of equal to or greater than five (5) acres of land. Large construction activity also includes the disturbance of less than five (5) acres of total land area that is part of a larger common plan of development or sale if the larger common plan will ultimately disturb equal to or greater than five (5) acres of land. Large construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, and original purpose of a ditch, channel, or other similar storm water conveyance. Large construction activity does not include the routine grading of existing dirt roads, asphalt overlays of existing roads, the routine clearing of existing right-of-ways, and similar maintenance activities.

**Municipal Separate Storm Sewer System (MS4)** - A separate storm sewer system owned or operated by a state, city, town, county, district, association, or other public body (created by or pursuant to state law) having jurisdiction over the disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under state law such as a sewer district, flood control or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization.

**Notice of Intent (NOI)** - A written submission to the executive director from an applicant requesting coverage under a general permit.

**Notice of Termination (NOT)** - A written submission to the executive director from a permittee authorized under a general permit requesting termination of coverage.

**Operator** - The person or persons associated with a large or small construction activity that meets either of the following two criteria:

- (a) the person or persons have operational control over construction plans and specifications to the extent necessary to meet the requirements and conditions of this general permit; or
- (b) the person or persons have day-to-day operational control of those activities at a construction site which are necessary to ensure compliance with a storm water pollution prevention plan for the site or other permit conditions (e.g. they are authorized to direct workers at a site to carry out activities required by the Storm Water Pollution Prevention Plan or comply with other permit conditions).

**Permittee** - An operator authorized under this general permit. The authorization may be gained through submission of a notice of intent, by waiver, or by meeting the requirements for automatic coverage to discharge storm water runoff and certain non-storm water discharges.

**Point Source** - Any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are, or may be, discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

**Pollutant** - (from the Texas Water Code, Chapter 26) Dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, filter backwash, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste discharged into any surface water in the state. The term "pollutant" does not include tail water or runoff water from irrigation or rainwater runoff from cultivated or uncultivated rangeland, pastureland, and farmland.

**Pollution** - (from the Texas Water Code, Chapter 26) The alteration of the physical, thermal, chemical, or biological quality of, or the contamination of, any surface water in the state that renders the water harmful, detrimental, or injurious to humans, animal life, vegetation, or property or to public health, safety, or welfare, or impairs the usefulness or the public enjoyment of the water for any lawful or reasonable purpose.

**Runoff Coefficient** - The fraction of total rainfall that will appear at the conveyance as runoff.

**Separate Storm Sewer System** - A conveyance or system of conveyances (including roads with drainage systems, streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains), designed or used for collecting or conveying storm water; that is not a combined sewer, and that is not part of a publicly owned treatment works (POTW).

**Small Construction Activity** - Construction activities including clearing, grading, and excavating that result in land disturbance of equal to or greater than one (1) acre and less than five (5) acres of land. Small construction activity also includes the disturbance of less than one (1) acre of total land area that is part of a larger common plan of development or sale if the larger common plan will ultimately disturb equal to or greater than one (1) and less than five (5) acres of land. Small construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, and original purpose of a ditch, channel, or other similar storm water conveyance. Small construction activity does not include the routine grading of existing dirt roads, asphalt overlays of existing roads, the routine clearing of existing right-of-ways, and similar maintenance activities.

**Storm Water** - Storm water runoff, snow melt runoff, and surface runoff and drainage.

**Storm Water Associated with Construction Activity** - Storm water runoff from a construction activity where soil disturbing activities (including clearing, grading, excavating) result in the disturbance of one (1) or more acres of total land area, or are part of a larger common plan of development or sale that will result in disturbance of one (1) or more acres of total land area.

**Structural Control (or Practice)** - A pollution prevention practice that requires the construction of a device, or the use of a device, to capture or prevent pollution in storm water runoff. Structural controls and practices may include but are not limited to: silt fences, earthen dikes, drainage swales, sediment traps, check dams, subsurface drains, storm drain inlet protection, rock outlet protection, reinforced soil retaining systems, gabions, and temporary or permanent sediment basins.

**Surface Water in the State** - Lakes, bays, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, wetlands, marshes, inlets, canals, the Gulf of Mexico inside the territorial limits

of the state (from the mean high water mark (MHW) out 10.36 miles into the Gulf), and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, navigable or nonnavigable, and including the beds and banks of all water-courses and bodies of surface water, that are wholly or partially inside or bordering the state or subject to the jurisdiction of the state; except that waters in treatment systems which are authorized by state or federal law, regulation, or permit, and which are created for the purpose of waste treatment are not considered to be water in the state.

**Temporary Stabilization** - A condition where exposed soils or disturbed areas are provided a protective cover, which may include temporary seeding, geotextiles, mulches, and other techniques to reduce or eliminate erosion until either final stabilization can be achieved or until further construction activities take place.

**Waters of the United States** - (from title 40, part 122, section 2 of the Code of Federal Regulations) Waters of the United States or waters of the U.S. means:

- (a) all waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
- (b) all interstate waters, including interstate wetlands;
- (c) all other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds that the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:
  - (1) which are or could be used by interstate or foreign travelers for recreational or other purposes;
  - (2) from which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
  - (3) which are used or could be used for industrial purposes by industries in interstate commerce;
- (d) all impoundments of waters otherwise defined as waters of the United States under this definition;
- (e) tributaries of waters identified in paragraphs (a) through (d) of this definition;
- (f) the territorial sea; and
- (g) wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR § 423.11(m) which also meet the criteria of this definition) are not waters of the United States. This exclusion applies only to manmade bodies of water which neither were originally created in waters of the United States (such as disposal area in wetlands) nor resulted from the impoundment of waters of the United States. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA.

**Part II. Permit Applicability and Coverage**

**Section A. Discharges Eligible for Authorization**

1. Storm Water Associated with Construction Activity

Discharges of storm water runoff from small and large construction activities may be authorized under this general permit.

2. Discharges of Storm Water Associated with Construction Support Activities

Discharges of storm water runoff from construction support activities, including concrete batch plants, asphalt batch plants, equipment staging areas, material storage yards, material borrow areas, and excavated material disposal areas may be authorized under this general permit provided:

- (a) the activity is located within a 1-mile distance from the boundary of the permitted construction site and directly supports the construction activity;
- (b) the storm water pollution prevention plan is developed according to the provisions of this general permit and includes appropriate controls and measures to reduce erosion and discharge of pollutants in storm water runoff from the supporting industrial activity site; and
- (c) the industrial activity either does not operate beyond the completion date of the construction activity or obtains separate TPDES authorization for discharges.

3. Non-storm Water Discharges

The following non-storm water discharges from sites authorized under this general permit are also eligible for authorization under this general permit:

- (a) discharges from fire fighting activities;

- (b) fire hydrant flushings;
- (c) vehicle, external building, and pavement wash water where detergents and soaps are not used and where spills or leaks of toxic or hazardous materials have not occurred (unless spilled materials have been removed; and if local state, or federal regulations are applicable, the materials are removed according to those regulations), and where the purpose is to remove mud, dirt, an dust;
- (d) water used to control dust;
- (e) potable water sources including waterline flushings;
- (f) air conditioning condensate;
- (g) uncontaminated ground water or spring water, including foundation or footing drains where flows are not contaminated with industrial materials such as solvents.

4. Other Permitted Discharges

Any discharge authorized under a separate NPDES, TPDES, or TCEQ permit may be combined with discharges authorized by this permit.

**Section B. Limitations on Permit Coverage**

1. Post Construction Discharges.

Discharges that occur after construction activities have been completed, and after the construction site and any supporting activity site have undergone final stabilization, are not eligible for coverage under this general permit. Discharges originating from the sites are not authorized under this general permit following the submission of the notice of termination (NOT) for the construction activity.

2. Prohibition of Non-Storm Water Discharges

Except as provided in Part II. A.2., A3., and A4., all discharges authorized by this general permit must be composed entirely of storm water associated with construction activity.

3. Compliance With Water Quality Standards

Discharges to surface water in the state that would cause or contribute to a violation of water quality standards or that would fail to protect and maintain existing designated uses are not eligible for coverage under this general permit. The executive director may require an application for an individual permit or alternative



general permit (see Part II.G.3) to authorize discharges to surface water in the state from any activity that is determined to cause a violation of water quality standards or is found to cause, or contribute to, the loss of a designated use. The executive director may also require an application for an individual permit considering factors described in Part II. G.2.

4. Discharges to Water Quality-Impaired Receiving Waters.

New sources or new discharges of the constituents of concern to impaired waters are not authorized by this permit unless otherwise allowable under 30 TAC Chapter 305 and applicable state law. Impaired waters are those that do not meet applicable water quality standards and are listed on the EPA approved Clean Water Act Section 303(d) list. Constituents of concern are those for which the water body is listed as impaired.

Discharges of the constituents of concern to impaired water bodies for which there is a total maximum daily load (TMDL) implementation plan are not eligible for this permit unless they are consistent with the approved TMDL and the implementation plan. Permittees must incorporate the limitations, conditions, and requirements applicable to their discharges, including monitoring frequency and reporting required by TCEQ rules, into their storm water pollution prevention plan in order to be eligible for coverage under this general permit.

5. Discharges to the Edwards Aquifer Recharge Zone

Discharges cannot be authorized by this general permit where prohibited by 30 Texas Administrative Code (TAC) Chapter 213 (relating to Edwards Aquifer).

- (a) For new discharges located within the Edwards Aquifer Recharge Zone, or within that area upstream from the recharge zone and defined as the Contributing Zone, operators must meet all applicable requirements of, and operate according to, 30 TAC Chapter 213 (Edwards Aquifer Rule) in addition to the provisions and requirements of this general permit.
- (b) For existing discharges, the requirements of the agency-approved Water Pollution Abatement Plan under the Edwards Aquifer Rules are in addition to the requirements of this general permit. BMPs and maintenance schedules for structural storm water controls, for example, may be required as a provision of the rule. All applicable requirements of the Edwards Aquifer Rule for reductions of suspended solids in storm water runoff are in addition to the requirements in this general permit for this pollutant. For discharges from large construction activities located on the Edwards Aquifer contributing zone, applicants must also submit a copy of the NOI to the appropriate TCEQ regional office.”

Counties:

Contact:

Comal, Bexar, Medina, Uvalde,  
and Kinney

TCEQ  
Water Program Manager  
San Antonio Regional Office  
14250 Judson Rd.  
San Antonio, Texas  
(210) 490-3096

Williamson, Travis, and Hays

TCEQ  
Water Program Manager  
Austin Regional Office  
1921 Cedar Bend Dr., Ste. 150  
Austin, Texas  
(512) 339-2929.

6. Discharges to Specific Watersheds and Water Quality Areas

Discharges otherwise eligible for coverage cannot be authorized by this general permit where prohibited by 30 TAC Chapter 311 (relating to Watershed Protection) for water quality areas and watersheds.

7. Protection of Streams and Watersheds by Other Governmental Entities

This general permit does not limit the authority or ability of federal, other state, or local governmental entities from placing additional or more stringent requirements on construction activities or discharges from construction activities. For example, this permit does not limit the authority of a home-rule municipality provided by Section 401.002 of the Texas Local Government Code.

8. Indian Country Lands

Storm water runoff from construction activities occurring on Indian Country lands are not under the authority of the TCEQ and are not eligible for coverage under this general permit. If discharges of storm water require authorization under federal National Pollutant Discharge Elimination System (NPDES) regulations, authority for these discharges must be obtained from the U.S. Environmental Protection Agency (EPA).

9. Oil and Gas Production

Storm water runoff from construction activities associated with the exploration, development, or production of oil or gas or geothermal resources, including transportation of crude oil or natural gas by pipeline, are not under the authority of the TCEQ and are not eligible for coverage under this general permit. If discharges

of storm water require authorization under federal NPDES regulations, authority for these discharges must be obtained from the EPA.

10. Storm Water Discharges from Agricultural Activities

Storm water discharges from agricultural activities that are not point source discharges of storm water are not subject to TPDES permit requirements. These activities may include clearing and cultivating ground for crops, construction of fences to contain livestock, construction of stock ponds, and other similar agricultural activities.

**Section C. Deadlines for Obtaining Authorization to Discharge**

1. Large Construction Activities

(a) New Construction - Discharges from sites where the commencement of construction occurs on or after the issuance date of this general permit must be authorized, either under this general permit or a separate TPDES permit, prior to the commencement of those construction activities.

(b) Ongoing Construction - Operators of large construction activities continuing to operate after the issuance date of this permit, and authorized under NPDES general permit TXR100000 (issued July 6, 1998, FR 36490), must submit an NOI to obtain authorization under this general permit within 90 days of the issuance date of this general permit. During this interim period, as a requirement of this TPDES permit, the operator must continue to meet the conditions and requirements of the federal NPDES permit. If the construction activity is completed prior to this 90-day deadline, and the site would otherwise qualify for termination of coverage under that federal NPDES permit, the operator must notify the executive director of the TCEQ in writing within 30 days of that condition.

2. Small Construction Activities

(a) New Construction - Discharges from sites where the commencement of construction occurs on or after the issuance date of this general permit must be authorized, either under this general permit or a separate TPDES permit, prior to the commencement of those construction activities.

(b) Ongoing Construction - Discharges from ongoing small construction activities that commenced prior to March 10, 2003, and that would not meet the conditions to qualify for termination of this permit as described in Part II.E. of this general permit, must be authorized, either under this general permit or a separate TPDES permit, prior to March 10, 2003.

**Section D. Obtaining Authorization to Discharge**

1. Small construction activities are determined to occur during periods of low potential for erosion, and operators of these sites may be automatically authorized under this general permit and not required to develop a storm water pollution prevention plan or submit a notice of intent (NOI), provided:
  - (a) the construction activity occurs in a county listed in Appendix A;
  - (b) the construction activity is initiated and completed, including either final or temporary stabilization of all disturbed areas, within the time frame identified in Appendix A for the location of the construction site;
  - (c) all temporary stabilization is adequately maintained to effectively reduce or prohibit erosion, final stabilization activities have been initiated and a condition, of final stabilization is completed no later than 30 days following the end date of the time frame identified in Appendix A for the location of the construction site;
  - (d) the permittee signs a completed construction site notice (Attachment 1 of this general permit), including the certification statement;
  - (e) a signed copy of the construction site notice is posted at the construction site in a location where it is readily available for viewing by the general public, local, state, and federal authorities prior to commencing construction activities, and maintained in that location until completion of the construction activity;
  - (f) a copy of the signed and certified construction site notice is provided to the operator of any municipal separate storm sewer system receiving the discharge at least two days prior to commencement of construction activities; and
  - (g) any supporting concrete batch plant or asphalt batch plant is separately authorized for discharges of storm water runoff or other non-storm water discharges under an individual TPDES permit, another TPDES general permit or under an individual TCEQ permit where storm water and non-storm water is disposed of by evaporation or irrigation (discharges are adjacent to water in the state).
  
2. Operators of small construction activities not described in Part II.D.1. above may be automatically authorized under this general permit, and operators of these sites are not required to submit an NOI provided they:
  - (a) develop a SWP3 according to the provisions of this general permit, that covers either the entire site or all portions of the site for which the applicant

- is the operator, and implement that plan prior to commencing construction activities;
- (b) sign a completed construction site notice ( Attachment 2 of this general permit);
  - (c) post a signed copy of the construction site notice at the construction site in a location where it is readily available for viewing by the general public, local, state, and federal authorities, prior to commencing construction activities, and maintain the notice in that location until completion of the construction activity; and
  - (d) provide a copy of the signed and certified construction site notice to the operator of any municipal separate storm sewer system receiving the discharge at least two days prior to commencement of construction activities.
3. Operators of all other construction activities that qualify for coverage under this general permit must:
- (a) develop a SWP3 according to the provisions of this general permit, that covers either the entire site or all portions of the site for which the applicant is the operator, and implement that plan prior to commencing construction activities;
  - (b) submit a Notice of Intent (NOI), using a form provided by the executive director, at least 2 days prior to commencing construction activities; or
  - (c) if the operator changes, or an additional operator is added after the initial NOI is submitted, the new operator must submit an NOI at least two (2) days before assuming operational control;
  - (d) post a copy of the NOI at the construction site in a location where it is readily available for viewing prior to commencing construction activities, and maintain the notice in that location until completion of the construction activity;
  - (e) provide a copy of the signed NOI to the operator of any municipal separate storm sewer system receiving the discharge, at least two (2) days prior to commencing construction activities; and
  - (f) implement the SWP3 prior to beginning construction activities.

4. Effective Date of Coverage

- (a) Operators of construction activities described in either Part II. D.1. or D.2. are authorized immediately following compliance with the conditions of Part II. D.1. or D.2. that are applicable to the construction activity.
- (b) Operators of all other construction activities eligible for coverage under this general permit, unless otherwise notified by the executive director, are provisionally authorized two (2) days from the date that a completed NOI is postmarked for delivery to the TCEQ. If electronic submission of the NOI is provided, and unless otherwise notified by the executive director, operators are provisionally authorized 24 hours following confirmation of receipt of the NOI by the TCEQ. Authorization is non-provisional when the executive director finds the NOI is administratively complete and an authorization number is issued for the activity.
- (c) Operators are not prohibited from submitting late NOIs or posting late notices to obtain authorization under this general permit. The TCEQ reserves the right to take appropriate enforcement actions for any unpermitted activities that may have occurred between the time construction commenced and authorization is obtained.

5. Notice of Change (NOC) Letter

If the operator becomes aware that it failed to submit any relevant facts, or submitted incorrect information in an NOI, the correct information must be provided to the executive director in a NOC letter within 14 days after discovery. If relevant information provided in the NOI changes, a NOC letter must be submitted within 14 days of the change. A copy of the NOC must be provided to the operator of any MS4 receiving the discharge.

6. Signatory Requirement for NOI Forms, Notice of Termination (NOT) Forms, NOC Letters, and Construction Site Notices

NOI forms, NOT forms, NOC letters, and Construction Site Notices must be signed according to 30 TAC § 305.44 (relating to Application for Permit).

7. Contents of the NOI

The NOI form shall require, at a minimum, the following information:

- (a) the name, address, and telephone number of the operator filing the NOI for permit coverage;
- (b) the name (or other identifier), address, county, and latitude/longitude of the construction project or site;

- (c) number of acres that will be disturbed (estimated to the largest whole number);
- (d) whether the project or site is located on Indian Country lands;
- (e) confirmation that a SWP3 has been developed and that the SWP3 will be compliant with any applicable local sediment and erosion control plans; and
- (f) name of the receiving water(s).

#### **Section E. Application to Terminate Coverage**

Each operator that has submitted an NOI for authorization under this general permit must apply to terminate that authorization following the conditions described in this section of the general permit. Authorization must be terminated by submitting a Notice of Termination (NOT) on a form supplied by the executive director. Authorization to discharge under this permit terminates at midnight on the day the NOT is postmarked for delivery to the TCEQ. If electronic submission of the NOT is provided, authorization to discharge under this permit terminates immediately following confirmation of receipt of the NOT by the TCEQ. Compliance with the conditions and requirements of this permit is required until an NOT is submitted.

##### **1. Notice of Termination Required**

The NOT must be submitted to TCEQ, and a copy of the NOT provided to the operator of any MS4 receiving the discharge, within thirty (30) days, after:

- (a) final stabilization has been achieved on all portions of the site that is the responsibility of the permittee; or
- (b) another permitted operator has assumed control over all areas of the site that have not been finally stabilized; and
- (c) all silt fences and other temporary erosion controls have either been removed, scheduled for removal as defined in the SWP3, or transferred to a new operator if the new operator has sought permit coverage. Erosion controls that are designed to remain in place for an indefinite period, such as mulches and fiber mats, are not required to be removed or scheduled for removal.

##### **2. Minimum Contents of the NOT**

The NOT form shall require, at a minimum, the following information:

- (a) if authorization was granted following submission of a NOI, the permittees site-specific TPDES general permit number for the construction site;

- (b) an indication of whether the construction activity is completed or if the permittee is simply no longer an operator at the site;
- (c) the name, address and telephone number of the permittee submitting the NOT;
- (d) the name (or other identifier), address, county, and latitude/longitude of the construction project or site; and
- (e) a signed certification that either all storm water discharges requiring authorization under this general permit will no longer occur, or that the applicant to terminate coverage is no longer the operator of the facility or construction site, and that all temporary structural erosion controls have either been removed, will be removed on a schedule defined in the SWP3, or transferred to a new operator if the new operator has applied for permit coverage. Erosion controls that are designed to remain in place for an indefinite period, such as mulches and fiber mats, are not required to be removed or scheduled for removal.

**Section F. Waivers from Coverage**

The executive director may waive the otherwise applicable requirements of this general permit for storm water discharges from small construction activities under the terms and conditions described in this section.

1. **Waiver Applicability and Coverage**

Operators of small construction activities may apply for and receive a waiver from the requirements to obtain authorization under this general permit where:

- (a) the calculated rainfall erosivity R factor for the entire period of the construction project is less than five (5);
- (b) the operator submits a signed waiver certification form, supplied by the executive director, certifying that the construction activity will commence and be completed within a period when the value of the calculated rainfall erosivity R factor is less than five (5); and
- (c) the waiver certification form is submitted to the TCEQ at least two (2) days before construction activity begins.

2. **Effective Date of Waiver**

Operators of small construction activities are provisionally waived from the otherwise applicable requirements of this general permit two (2) days from the date that a completed waiver certification form is postmarked for delivery to TCEQ.



### 3. Activities Extending Beyond the Waiver Period

If a construction activity extends beyond the approved waiver period due to circumstances beyond the control of the operator, the operator must either:

- (a) recalculate the rainfall erosivity factor R factor using the original start date and a new projected ending date, and if the R factor is still under five (5), submit a new waiver certification form at least two (2) days before the end of the original waiver period; or
- (b) obtain authorization under this general permit according to the requirements delineated in either Part II.D.2. or Part II.D.3. at least two (2) days before the end of the approved waiver period.

## Section G. Alternative TPDES Permit Coverage

### 1. Individual Permit Alternative

Any discharge eligible for coverage under this general permit may alternatively be authorized under an individual TPDES permit according to 30 TAC Chapter 305 (relating to Consolidated Permits). Applications for individual permit coverage should be submitted at least three hundred and thirty (330) days prior to commencement of construction activities to ensure timely issuance.

### 2. Individual Permit Required

The executive director may suspend an authorization or NOI in accordance with the procedures set forth in 30 TAC Chapter 205, including the requirement that the executive director provide written notice to the permittee. The executive director may require an operator of a construction site, otherwise eligible for authorization under this general permit, to apply for an individual TPDES permit because of:

- (a) the conditions of an approved TMDL or TMDL implementation plan;
- (b) the activity is determined to cause a violation of water quality standards or is found to cause, or contribute to, the loss of a designated use of surface water in the state; and
- (c) any other considerations defined in 30 TAC Chapter 205 would include the provision at 30 TAC § 205.4(c)(3)(D), which allows TCEQ to deny authorization under the general permit and require an individual permit if a discharger “has been determined by the executive director to have been out of compliance with any rule, order, or permit of the commission, including non-payment of fees assessed by the executive director.”

3. Any discharge eligible for authorization under this general permit may alternatively be authorized under a separate, applicable general permit according to 30 TAC Chapter 205 (relating to General Permits for Waste Discharges).

#### **Section H. Permit Expiration**

This general permit shall be issued for a term not to exceed five (5) years. Following public notice and comment, as provided by 30 TAC § 205.3 (relating to Public Notice, Public Meetings, and Public Comment), the commission may amend, revoke, cancel, or renew this general permit. If the TCEQ publishes a notice of its intent to renew or amend this general permit before the expiration date, the permit will remain in effect for existing, authorized, discharges until the commission takes final action on the permit. Upon issuance of a renewed or amended permit, permittees may be required to submit an NOI within 90 days following the effective date of the renewed or amended permit, unless that permit provides for an alternative method for obtaining authorization.

In the event that the general permit is not renewed, discharges that are authorized under the general permit must obtain either a TPDES individual permit or coverage under an alternative general permit.

#### **Part III. Storm Water Pollution Prevention Plans (SWP3)**

Storm water pollution prevention plans must be prepared for storm water discharges that will reach Waters of the United States, including discharges to MS4 systems and privately owned separate storm sewer systems that drain to Waters of the United States, to identify and address potential sources of pollution that are reasonably expected to affect the quality of discharges from the construction site, including off-site material storage areas, overburden and stockpiles of dirt, borrow areas, equipment staging areas, vehicle repair areas, fueling areas, etc., used solely by the permitted project. The SWP3 must describe and ensure the implementation of practices that will be used to reduce the pollutants in storm water discharges associated with construction activity at the construction site and assure compliance with the terms and conditions of this permit.

Individual operators at a site may develop separate SWP3s that cover only their portion of the project provided reference is made to the other operators at the site. Where there is more than one SWP3 for a site, permittees must coordinate to ensure that BMPs and controls are consistent, and do not negate or impair the effectiveness of each other. Regardless of whether a single comprehensive SWP3 is developed, or separate SWP3s are developed for each operator, it is the responsibility of each operator to ensure that compliance with the terms and conditions of this general permit is met in the areas of the construction site where that operator has operational control over construction plans and specifications or day-to-day operational control.

#### **Section A. Shared SWP3 Development**

For more effective coordination of BMPs and opportunities for cost sharing, a cooperative effort by the different operators at a site is encouraged. Operators must independently submit an NOI and obtain authorization, but may work together to prepare and implement a single comprehensive SWP3 for the entire construction site.

1. The SWP3 must clearly list the name and, for large construction activities, the general permit authorization numbers, for each operator that participates in the shared SWP3. Until the TCEQ responds to receipt of the NOI with a general permit authorization number, the SWP3 must specify the date that the NOI was submitted to TCEQ by each operator. Each participant in the shared plan must also sign the SWP3.
2. The SWP3 must clearly indicate which operator is responsible for satisfying each shared requirement of the SWP3. If the responsibility for satisfying a requirement is not described in the plan, then each permittee is entirely responsible for meeting the requirement within the boundaries of the construction site where they perform construction activities. The SWP3 must clearly describe responsibilities for meeting each requirement in shared or common areas.

**Section B. Responsibilities of Operators**

1. Operators with Control Over Construction Plans and Specifications

All operators with operational control over construction plans and specifications to the extent necessary to meet the requirements and conditions of this general permit must:

- (a) ensure the project specifications allow or provide that adequate BMPs may be developed to meet the requirements of Part III of this general permit;
- (b) ensure that the SWP3 indicates the areas of the project where they have operational control over project specifications (including the ability to make modifications in specifications);
- (c) ensure all other operators affected by modifications in project specifications are notified in a timely manner such that those operators may modify best management practices as are necessary to remain compliant with the conditions of this general permit; and
- (d) ensure that the SWP3 for portions of the project where they are operators indicates the name and TPDES permit numbers for permittees with the day-to-day operational control over those activities necessary to ensure compliance with the SWP3 and other permit conditions. In the case that responsible parties have not been identified, the permittee with operational control over project specifications must be considered to be the responsible party until such time as the authority is transferred to another party and the plan is updated.

2. **Operators with Day-to-Day Operational Control**

Operators with day-to-day operational control of those activities at a project that are necessary to ensure compliance with a SWP3 and other permit conditions must:

- (a) ensure that the SWP3 for portions of the project where they are operators meets the requirements of this general permit;
- (b) ensure that the SWP3 identifies the parties responsible for implementation of best management practices described in the plan;
- (c) ensure that the SWP3 indicates areas of the project where they have operational control over day-to-day activities;
- (d) ensure that the SWP3 indicates, for areas where they have operational control over day-to-day activities, the name and TPDES permit number of the parties with operational control over project specifications (including the ability to make modifications in specifications).

**Section C. Deadlines for SWP3 Preparation and Compliance**

1. The SWP3 must be:

- (a) completed prior to obtaining authorization under this general permit;
- (b) implemented prior to commencing construction activities that result in soil disturbance;
- (c) updated as necessary to reflect the changing conditions of new operators, new areas of responsibility, and changes in best management practices; and
- (d) prepared so that it provides for compliance with the terms and conditions of this general permit.

**Section D. Plan Review and Making Plans Available**

- 1. The SWP3 must be retained on-site at the construction site or, if the site is inactive or does not have an on-site location to store the plan, a notice must be posted describing the location of the SWP3. The SWP3 must be made readily available at the time of an on-site inspection to: the executive director; a federal, state, or local agency approving sediment and erosion plans, grading plans, or storm water management plans; local government officials; and the operator of a municipal separate storm sewer receiving discharges from the site.
- 2. Operators of a large construction activity obtaining authorization to discharge through submission of a NOI must post a notice near the main entrance of the

construction site. If the construction project is a linear construction project (e.g. pipeline, highway, etc.), the notice must be placed in a publicly accessible location near where construction is actively underway. Notice for these linear sites may be relocated, as necessary, along the length of the project. The notice must be readily available for viewing by the general public, local, state, and federal authorities, and contain the following information:

- (a) the TPDES general permit number for the project (or a copy of the NOI that was submitted to the TCEQ if a permit number has not yet been assigned);
  - (b) the name and telephone number of a representative for the operator;
  - (c) a brief description of the project; and
  - (d) the location of the SWP3.
3. This permit does not provide the general public with any right to trespass on a construction site for any reason, including inspection of a site; nor does this permit require that permittees allow members of the general public access to a construction site.

**Section E. Keeping Plans Current**

The permittee must revise or update the storm water pollution prevention plan whenever:

- 1. there is a change in design, construction, operation, or maintenance that has a significant effect on the discharge of pollutants and that has not been previously addressed in the SWP3; or
- 2. results of inspections or investigations by site operators, operators of a municipal separate storm sewer system receiving the discharge, authorized TCEQ personnel, or a federal, state or local agency approving sediment and erosion plans indicate the SWP3 is proving ineffective in eliminating or significantly minimizing pollutants in discharges authorized under this general permit.

**Section F. Contents of SWP3**

The SWP3 must include, at a minimum, the information described in this section.

- 1. A site description, or project description must be developed to include:
  - (a) a description of the nature of the construction activity, potential pollutants and sources;
  - (b) a description of the intended schedule or sequence of major activities that will disturb soils for major portions of the site;

- (c) the total number of acres of the entire property and the total number of acres where construction activities will occur, including off-site material storage areas, overburden and stockpiles of dirt, and borrow areas;
  - (d) data describing the soil or the quality of any discharge from the site;
  - (e) a map showing the general location of the site (e.g. a portion of a city or county map);
  - (f) a detailed site map (or maps) indicating the following:
    - (i) drainage patterns and approximate slopes anticipated after major grading activities;
    - (ii) areas where soil disturbance will occur;
    - (iii) locations of all major structural controls either planned or in place;
    - (iv) locations where stabilization practices are expected to be used;
    - (v) locations of off-site material, waste, borrow, fill, or equipment storage areas;
    - (vi) surface waters (including wetlands) either adjacent or in close proximity; and
    - (vii) locations where storm water discharges from the site directly to a surface water body.
  - (g) the location and description of asphalt plants and concrete plants providing support to the construction site and authorized under this general permit;
  - (h) the name of receiving waters at or near the site that will be disturbed or that will receive discharges from disturbed areas of the project; and
  - (i) a copy of this TPDES general permit.
2. The SWP3 must describe the best management practices that will be used to minimize pollution in runoff. The description must identify the general timing or sequence for implementation. At a minimum, the description must include the following components:
- (a) Erosion and Sediment Controls
    - (i) Erosion and sediment controls must be designed to retain sediment on-site to the extent practicable with consideration for local

topography, soil type, and rainfall. Controls must also be designed and utilized to reduce the offsite transport of suspended sediments and other pollutants if it is necessary to pump or channel standing water from the site.

- (ii) Control measures must be properly selected, installed, and maintained according to the manufacturer's or designer's specifications. If periodic inspections or other information indicates a control has been used incorrectly, or that the control is performing inadequately, the operator must replace or modify the control as soon as practicable after discovery that the control has been used incorrectly, is performing inadequately, or is damaged.
  - (iii) Sediment must be removed from sediment traps and sedimentation ponds no later than the time that design capacity has been reduced by 50%.
  - (iv) If sediment escapes the site, accumulations must be removed at a frequency to minimize further negative effects, and whenever feasible, prior to the next rain event.
  - (v) Controls must be developed to limit, to the extent practicable, offsite transport of litter, construction debris, and construction materials.
- (b) Stabilization Practices

The SWP3 must include a description of interim and permanent stabilization practices for the site, including a schedule of when the practices will be implemented. Site plans should ensure that existing vegetation is preserved where it is possible.

- (i) Stabilization practices may include but are not limited to: establishment of temporary vegetation, establishment of permanent vegetation, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of existing trees and vegetation, and other similar measures.
- (ii) The following records must be maintained and either attached to or referenced in the SWP3, and made readily available upon request to the parties in Part III.D.1 of this general permit:
  - (a) the dates when major grading activities occur;
  - (b) the dates when construction activities temporarily or permanently cease on a portion of the site; and

- (c) the dates when stabilization measures are initiated.
- (iii) Stabilization measures must be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, and except as provided in (a) through (c) below, must be initiated no more than fourteen (14) days after the construction activity in that portion of the site has temporarily or permanently ceased.
    - (a) Where the initiation of stabilization measures by the 14th day after construction activity temporarily or permanently ceased is precluded by snow cover or frozen ground conditions, stabilization measures must be initiated as soon as practicable.
    - (b) Where construction activity on a portion of the site is temporarily ceased, and earth disturbing activities will be resumed within twenty-one (21) days, temporary stabilization measures do not have to be initiated on that portion of site.
    - (c) In arid areas (areas with an average rainfall of 0 to 10 inches), semiarid areas (areas with an average annual rainfall of 10 to 20 inches), and areas experiencing droughts where the initiation of stabilization measures by the 14th day after construction activity has temporarily or permanently ceased is precluded by seasonably arid conditions, stabilization measures must be initiated as soon as practicable.

### 3. Structural Control Practices

The SWP3 must include a description of any structural control practices used to divert flows away from exposed soils, to limit the contact of runoff with disturbed areas, or to lessen the off-site transport of eroded soils.

- (a) Sediment basins are required, where feasible for common drainage locations that serve an area with ten (10) or more acres disturbed at one time, a temporary (or permanent) sediment basin that provides storage for a calculated volume of runoff from a 2-year, 24-hour storm from each disturbed acre drained, or equivalent control measures, shall be provided where attainable until final stabilization of the site. Where rainfall data is not available or a calculation cannot be performed, a temporary (or permanent) sediment basin providing 3,600 cubic feet of storage per acre drained is required where attainable until final stabilization of the site. When calculating the volume of runoff from a 2-year, 24-hour storm event, it is not required to include the flows from offsite areas and flow from onsite areas that are either undisturbed or have already undergone final stabilization, if



these flows are diverted around both the disturbed areas of the site and the sediment basin. In determining whether installing a sediment basin is feasible, the permittee may consider factors such as site soils, slope, available area on site, public safety, precipitation patterns, site geometry, site vegetation, infiltration capacity, geotechnical factors, depth to groundwater and other similar considerations. Where sediment basins are not feasible, equivalent control measures, which may include a series of smaller sediment basins, must be used. At a minimum, silt fences, vegetative buffer strips, or equivalent sediment controls are required for all down slope boundaries (and for those side slope boundaries deemed appropriate as dictated by individual site conditions) of the construction area.

- (b) Sediment traps and sediment basins may also be used to control solids in storm water runoff for drainage locations serving less than ten (10) acres. At a minimum, silt fences, vegetative buffer strips, or equivalent sediment controls are required for all down slope boundaries (and for those side slope boundaries deemed appropriate as dictated by individual site conditions) of the construction. Alternatively, a sediment basin that provides storage for a calculated volume of runoff from a 2-year, 24-hour storm from each disturbed acre drained, or equivalent control measures, may be provided or where rainfall data is not available or a calculation cannot be performed, a temporary (or permanent) sediment basin providing 3,600 cubic feet of storage per acre drained may be provided.

#### 4. Permanent Storm Water Controls

A description of any measures that will be installed during the construction process to control pollutants in storm water discharges that will occur after construction operations have been completed must be included in the SWP3. Permittees are only responsible for the installation and maintenance of storm water management measures prior to final stabilization of the site or prior to submission of an NOT.

#### 5. Other Controls

- (a) Off-site vehicle tracking of sediments and the generation of dust must be minimized.
- (b) The SWP3 must include a description of construction and waste materials expected to be stored on-site and a description of controls to reduce pollutants from these materials.
- (c) The SWP3 must include a description of pollutant sources from areas other than construction (including storm water discharges from dedicated asphalt plants and dedicated concrete plants), and a description of controls and measures that will be implemented at those sites to minimize pollutant discharges.

- (d) Velocity dissipation devices shall be placed at discharge locations and along the length of any outfall channel to provide a non-erosive flow velocity from the structure to a water course so that the natural physical and biological characteristics and functions are maintained and protected.

6. Approved State and Local Plans

- (a) Permittees must ensure the SWP3 is consistent with requirements specified in applicable sediment and erosion site plans or site permits, or storm water management site plans or site permits approved by federal, state, or local officials.
- (b) SWP3s must be updated as necessary to remain consistent with any changes applicable to protecting surface water resources in sediment erosion site plans or site permits, or storm water management site plans or site permits approved by state or local official for which the permittee receives written notice.

7. Maintenance

All erosion and sediment control measures and other protective measures identified in the SWP3 must be maintained in effective operating condition. If through inspections the permittee determines that BMPs are not operating effectively, maintenance must be performed before the next anticipated storm event or as necessary to maintain the continued effectiveness of storm water controls. If maintenance prior to the next anticipated storm event is impracticable, maintenance must be scheduled and accomplished as soon as practicable. Erosion and sediment controls that have been intentionally disabled, run-over, removed, or otherwise rendered ineffective must be replaced or corrected immediately upon discovery.

8. Inspections of Controls

In the event of flooding or other uncontrollable situations which prohibit access to the inspection sites, inspections must be conducted as soon as access is practicable

- (a) Personnel provided by the permittee and familiar with the SWP3 must inspect disturbed areas of the construction site that have not been finally stabilized, areas used for storage of materials that are exposed to precipitation, and structural controls for evidence of, or the potential for, pollutants entering the drainage system. Sediment and erosion control measures identified in the SWP3 must be inspected to ensure that they are operating correctly. Locations where vehicles enter or exit the site must be inspected for evidence of off-site sediment tracking. Inspections must be conducted at least once every fourteen (14) calendar days and within twenty four (24) hours of the end of a storm event of 0.5 inches or greater.

Where sites have been finally or temporarily stabilized, where runoff is unlikely due to winter conditions (e.g. site is covered with snow, ice, or frozen ground exists), or during seasonal arid periods in arid areas (areas with an average annual rainfall of 0 to 10 inches) and semi-arid areas (areas with an average annual rainfall of 10 to 20 inches), inspections must be conducted at least once every month.

As an alternative to the above-described inspection schedule of once every fourteen (14) calendar days and within twenty four (24) hours of a storm event of 0.5 inches or greater, the SWP3 may be developed to require that these inspections will occur at least once every seven (7) calendar days. If this alternative schedule is developed, the inspection must occur on a specifically defined day, regardless of whether or not there has been a rainfall event since the previous inspection.

- (b) Utility line installation, pipeline construction, and other examples of long, narrow, linear construction activities may provide inspection personnel with limited access to the areas described in Part III.F.8.(a) above. Inspection of these areas could require that vehicles compromise temporarily or even permanently stabilized areas, cause additional disturbance of soils, and increase the potential for erosion. In these circumstances, controls must be inspected at least once every fourteen (14) calendar days and within twenty four (24) hours of the end of a storm event of 0.5 inches, but representative inspections may be performed. For representative inspections, personnel must inspect controls along the construction site for 0.25 mile above and below each access point where a roadway, undisturbed right-of-way, or other similar feature intersects the construction site and allows access to the areas described in Part III.F.8.(a) above. The conditions of the controls along each inspected 0.25 mile segment may be considered as representative of the condition of controls along that reach extending from the end of the 0.25 mile segment to either the end of the next 0.25 mile inspected segment, or to the end of the project, whichever occurs first.

As an alternative to the above-described inspection schedule of once every fourteen (14) calendar days and within twenty four (24) hours of a storm event of 0.5 inches or greater, the SWP3 may be developed to require that these inspections will occur at least once every seven (7) calendar days. If this alternative schedule is developed, the inspection must occur on a specifically defined day, regardless of whether or not there has been a rainfall event since the previous inspection.

- (c) The SWP3 must be modified based on the results of inspections, as necessary, to better control pollutants in runoff. Revisions to the SWP3 must be completed within seven (7) calendar days following the inspection. If existing BMPs are modified or if additional BMPs are necessary, an implementation schedule must be described in the SWP3 and wherever

possible those changes implemented before the next storm event. If implementation before the next anticipated storm event is impracticable, these changes must be implemented as soon as practicable.

- (d) A report summarizing the scope of the inspection, names and qualifications of personnel making the inspection, the dates of the inspection, and major observations relating to the implementation of the SWP3 must be made and retained as part of the SWP3. Major observations should include: The locations of discharges of sediment or other pollutants from the site; locations of BMPs that need to be maintained; locations of BMPs that failed to operate as designed or proved inadequate for a particular location; and locations where additional BMPs are needed.

Actions taken as a result of inspections must be described within, and retained as a part of, the SWP3. Reports must identify any incidents of non-compliance. Where a report does not identify any incidents of non-compliance, the report must contain a certification that the facility or site is in compliance with the SWP3 and this permit. The report must be signed by the person and in the manner required by 30 TAC § 305.128 (relating to Signatories to Reports)

- 9. The SWP3 must identify and ensure the implementation of appropriate pollution prevention measures for all eligible non-storm water components of the discharge.

**Part IV. Numeric Effluent Limitations**

**Section A. Limitations**

All discharges of storm water runoff from concrete batch plants that qualify for coverage, and that are authorized to discharge storm water under the provisions of this general permit must be monitored at the following monitoring frequency and comply with the following numeric effluent limitations:

<u>Parameter</u>	<u>Limitations</u> <u>Daily Maximum</u>	<u>Monitoring</u> <u>Frequency</u>
Total Suspended Solids	65 mg/l	1/Year*
Oil and Grease	15 mg/l	1/Year*
pH	between 6 and 9 standard units	1/Year*

\* If discharge occurs.

**Section B. Reporting Requirements**

Results of monitoring for determining compliance with numeric effluent limitations must be recorded on a discharge monitoring report (DMR). The DMR must either be an original EPA No. 3320-1 form (Attachment 3 of this general permit), a duplicate of the form, or as otherwise provided by the executive director. Monitoring must be conducted prior to December 31<sup>st</sup> for each annual

monitoring period. A copy of the DMR must either be retained at the facility or shall be made readily available for review by authorized TCEQ personnel upon request, by March 31<sup>st</sup> following the end of each annual monitoring period. If the results indicate the violation of one or more of these numeric limitations, the permittee must also submit the DMR to the TCEQ's Information Resources Center (MC 212) by March 31<sup>st</sup> of each annual monitoring period.

#### **Part V. Retention of Records**

The permittee must retain the following records for a minimum period of three (3) years from the date that a NOT is submitted as required by Part II.D. For activities that are not required to submit an NOT, records shall be retained for a minimum period of three (3) years from the date that either: final stabilization has been achieved on all portions of the site that is the responsibility of the permittee; or another permitted operator has assumed control according to over all areas of the site that have not been finally stabilized. Records include:

1. A copy of the SWP3 plan.
2. All reports and actions required by this permit, including a copy of the construction site notice.
3. All data used to complete the NOI, if an NOI is required for coverage under this general permit.

#### **Part VI. Standard Permit Conditions**

1. The permittee has a duty to comply with all permit conditions. Failure to comply with any permit condition is a violation of the permit and statutes under which it was issued, and is grounds for enforcement action, for terminating coverage under this general permit, or for requiring a discharger to apply for and obtain an individual TPDES permit.
2. Authorization under this general permit may be suspended or revoked for cause. Filing a notice of planned changes or anticipated non-compliance by the permittee does not stay any permit condition. The permittee must furnish to the executive director, upon request and within a reasonable time, any information necessary for the executive director to determine whether cause exists for revoking, suspending, or terminating authorization under this permit. Additionally, the permittee must provide to the executive director, upon request, copies of all records that the permittee is required to maintain as a condition of this general permit.
3. It is not a defense for a discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity to maintain compliance with the permit conditions.
4. Inspection and entry shall be allowed under Texas Water Code Chapters 26-28, Health and Safety Code §§ 361.032-361.033 and 361.037, and 40 Code of Federal Regulations (CFR) §122.41(i). The statement in Texas Water Code § 26.014 that commission entry of a facility shall occur according to an establishment's rules and regulations concerning safety, internal security, and fire protection is not grounds for denial or restriction of entry to any part of the

facility or site, but merely describes the commission's duty to observe appropriate rules and regulations during an inspection.

5. The discharger is subject to administrative, civil, and criminal penalties, as applicable, under Texas Water Code §§ 26.136, 26.212, and 26.213 for violations including but not limited to the following:
  - a. negligently or knowingly violating CWA, §§ 301, 302, 306, 307, 308, 318, or 405, or any condition or limitation implementing any sections in a permit issued under CWA, § 402, or any requirement imposed in a pretreatment program approved under CWA, §§ 402(a)(3) or 402(b)(8);
  - b. knowingly making any false statement, representation, or certification in any record or other document submitted or required to be maintained under a permit, including monitoring reports or reports of compliance or noncompliance.
6. All reports and other information requested by the executive director must be signed by the person and in the manner required by 30 TAC § 305.128 (relating to Signatories to Reports).
7. Authorization under this general permit does not convey property or water rights of any sort and does not grant any exclusive privilege.

**Part VII. Fees**

**Section A. Application Fees**

An application fee of \$100 must be submitted with each NOI for coverage of a large construction activity. A fee is not required for submission of an NOT or NOC letter.

**Section B. Water Quality Fees**

Large construction activities authorized under this general permit must pay an annual Water Quality Fee of \$100 under Texas Water Code 26.0291 and according to TAC Chapter 205 (relating to General Permits for Waste Discharges).

**Appendix A.  
Periods of Low Erosion Potential by County**

<u>Start Date - End Date</u>	<u>Start Date - End Date</u>	<u>Start Date - End Date</u>
<b>Dec. 15 - Feb. 14</b>	<b>Nov. 15 - Apr. 30</b>	<b>Nov. 15 - Jan. 14 or Feb. 1 - Mar. 30</b>
Archer	Andrews	Crockett
Baylor	Armstrong	Dickens
Brown	Borden	Kent
Callahan	Brewster	Motley
Childress	Briscoe	Val Verde
Coke	Carson	
Coleman	Castro	<u>Start Date - End Date</u>
Concho	Crane	<b>Nov. 1 - Apr. 14 or Nov. 15 - Apr. 30</b>
Cottle	Crosby	Dallam
Dimmit	Dawson	Hockley
Eastland	Deaf Smith	Lamb
Edwards	Ector	Parmer
Fisher	Floyd	Ward
Foard	Gaines	
Hardeman	Garza	<u>Start Date - End Date</u>
Haskell	Glasscock	<b>Nov. 1 - Apr. 30 or Nov. 15 - May. 14</b>
Irion	Hale	Bailey
Jones	Hansford	Cochran
Kerr	Hartley	Jeff Davis
Kimble	Howard	Loving
King	Hutchinson	Presidio
Kinney	Lubbock	Reeves
Knox	Lynn	Winkler
Mason	Martin	Yoakum
Maverick	Midland	
McCulloch	Mitchell	<u>Start Date - End Date</u>
Menard	Moore	<b>Nov. 1 - May. 14</b>
Nolan	Oldham	Culberson
Real	Pecos	Hudspeth
Runnels	Potter	
Schleicher	Randall	<u>Start Date - End Date</u>
Shackelford	Reagan	<b>Jan. 1 - Jul. 14 or May. 15 - Jul. 31 or</b>
Stephens	Scurry	<b>Jun. 1 - Aug. 14 or Jun. 15 - Sept. 14 or</b>
Stonewall	Sherman	<b>Jul. 1 - Oct. 14 or Jul. 15 - Oct. 31 or</b>
Sutton	Sterling	<b>Aug. 1 - Apr. 30 or Aug. 15 - May. 14 or</b>
Taylor	Swisher	<b>Sept. 1 - May. 30 or Oct. 1 - Jun. 14 or</b>
Throckmorton	Terrell	<b>Nov. 1 - Jun. 30 or Nov. 15 - Jul. 14</b>
Tom Green	Terry	El Paso
Uvalde	Upton	
Wichita		<u>Start Date - End Date</u>
Wilbarger	<u>Start Date - End Date</u>	<b>Jan. 1 - Mar. 30 or Dec. 1 - Feb. 28</b>
Young	<b>Feb. 1 - Mar. 30</b>	Collingsworth Wheeler
Zavala	Hall	Donley
		Gray
		Hemphill
		Lipscomb
		Ochiltree
		Roberts



# CONSTRUCTION SITE NOTICE

FOR THE  
**Texas Commission on Environmental Quality (TCEQ)**  
**Storm Water Program**  
**TPDES GENERAL PERMIT TXR150000**

The following information is posted in compliance with **Part II.D.1.** of the TCEQ General Permit Number TXR150000 for discharges of storm water runoff from construction sites. Additional information regarding the TCEQ storm water permit program may be found on the internet at:

[www.tnrc.state.tx.us/permitting/waterperm/wwperm/tpdestorm](http://www.tnrc.state.tx.us/permitting/waterperm/wwperm/tpdestorm)

Contact Name and Phone Number:	
Project Description:  (Physical address or description of the site's location, estimated start date and projected end date, or date that disturbed soils will be stabilized)	

For Construction Sites Authorized Under Part II.D.1. the following certification must be completed:

I \_\_\_\_\_ (Typed or Printed Name Person Completing This Certification) certify under penalty of law that I have read and understand the eligibility requirements for claiming an authorization by waiver under Part II.D.1. of TPDES General Permit TXR150000 and agree to comply with the terms of this permit. Construction activities at this site shall occur within a time period listed in Appendix A of the TPDES general permit for this county, that period beginning on \_\_\_\_\_ and ending on \_\_\_\_\_. I understand that if construction activities continue past this period, all storm water runoff must be authorized under a separate provision of this general permit. A copy of this signed notice is supplied to the operator of the MS4 if discharges enter an MS4 system. I am aware there are significant penalties for providing false information or for conducting unauthorized discharges, including the possibility of fine and imprisonment for knowing violations.

\_\_\_\_\_  
 Signature and Title

\_\_\_\_\_  
 Date





# CONSTRUCTION SITE NOTICE

FOR THE  
**Texas Commission on Environmental Quality (TCEQ)**  
**Storm Water Program**  
**TPDES GENERAL PERMIT TXR150000**

The following information is posted in compliance with **Part II.D.2.** of the TCEQ General Permit Number TXR150000 for discharges of storm water runoff from construction sites. Additional information regarding the TCEQ storm water permit program may be found on the internet at:

[www.tnrcc.state.tx.us/permitting/waterperm/wwperm/tpdestorm](http://www.tnrcc.state.tx.us/permitting/waterperm/wwperm/tpdestorm)

Contact Name and Phone Number:	
Project Description:  (Physical address or description of the site's location, estimated start date and projected end date, or date that disturbed soils will be stabilized)	
Location of Storm Water Pollution Prevention Plan :	

For Construction Sites Authorized Under Part II.D.2. (Obtaining Authorization to Discharge) the following certification must be completed:

I \_\_\_\_\_ (Typed or Printed Name Person Completing This Certification) certify under penalty of law that I have read and understand the eligibility requirements for claiming an authorization under Part II.D.2. of TPDES General Permit TXR150000 and agree to comply with the terms of this permit. A storm water pollution prevention plan has been developed and implemented according to permit requirements. A copy of this signed notice is supplied to the operator of the MS4 if discharges enter an MS4 system. I am aware there are significant penalties for providing false information or for conducting unauthorized discharges, including the possibility of fine and imprisonment for knowing violations.

\_\_\_\_\_  
Signature and Title

\_\_\_\_\_  
Date

**CONCRETE BATCH FACILITIES**

STW/ TXR15\_\_\_\_\_/ CO

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if Different)

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

**NOTE: Enter your permit number in the underlined space in the upper right hand corner of this page. Example: STW/TXR15 00123/ CO**

NAME

DISCHARGE MONITORING REPORT (DMR)

ADDRESS

(2-16)

(17-19)

FACILITY LOCATION

PERMIT NUMBER			DISCHARGE NUMBER		
MONITORING PERIOD					
YEAR	MO	DAY	YEAR	MO	DAY
(20-21)	(22-23)	(24-25)	(26-27)	(28-29)	(30-31)
	01	01		12	31

Mail to: TCEQ (MC 212)  
P.O. Box 13087  
Austin, TX 78711-3087

PARAMETER (32-37)	SAMPLE MEASUREMENT / REQUIREMENT	(3 Card Only) QUANTITY OR LOADING (54-61)			(4 Card Only) QUALITY OR CONCENTRATION (54-61)			NO. EX (62-63)	FREQUENCY OF ANALYSIS (64-68)	SAMPLE TYPE (69-70)
		AVERAGE (46-53)	MAXIMUM	UNITS	MINIMUM (38-45)	AVERAGE (46-53)	MAXIMUM			
Total Suspended Solids	SAMPLE MEASUREMENT	*****	*****	*****	*****	*****				
	SAMPLE REQUIREMENT	*****	*****	*****	*****	*****	65 Daily Max	mg/l	1/Year	Grab
Oil & Grease	SAMPLE MEASUREMENT	*****	*****	*****	*****	*****				
	SAMPLE REQUIREMENT	*****	*****	*****	*****	*****	15 Daily Max	mg/l	1/Year	Grab
pH	SAMPLE MEASUREMENT	*****	*****	*****	*****	*****				
	SAMPLE REQUIREMENT	*****	*****	*****	*****	*****	6.0 - 9.0 Range	S.U.	1/Year	Grab
	SAMPLE MEASUREMENT									
	SAMPLE REQUIREMENT									

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER	<small>CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED, BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION. THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS.</small>	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	TELEPHONE	DATE		
TYPED OR PRINTED		AREA CODE	NUMBER	YEAR	MO	DAY

COMMENTS AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

NPDES  
FORM



United States Environmental Protection Agency  
Washington, DC 20460

**Notice of Intent (NOI) for Storm Water Discharges Associated with  
CONSTRUCTION ACTIVITY Under a NPDES General Permit**

Submission of this Notice of Intent (NOI) constitutes notice that the party identified in Section II of this form requests authorization to discharge pursuant to the NPDES Construction General Permit (CGP) Number identified in Section I of this form. Submission of this NOI also constitutes notice that the party identified in Section II of this form meets the eligibility requirements in Part 1.3 of the CGP for the project identified in Section III of this form. Permit coverage is required prior to commencement of construction activity until final stabilization. TO OBTAIN AUTHORIZATION, THIS FORM MUST BE COMPLETE AND ACCURATE. SEE INSTRUCTIONS AT THE END OF THIS FORM.

**I. Permit Number**

\_\_\_\_\_

**II. Operator Information**

Name: \_\_\_\_\_

IRS Employer Identification Number (EIN): \_\_\_\_\_ - \_\_\_\_\_

Street: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_ - \_\_\_\_\_

Phone: \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ Fax (optional): \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_

Email (optional): \_\_\_\_\_

**III. Project/Site Information**

Project/Site Name: \_\_\_\_\_

Project Street/Location: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_ - \_\_\_\_\_

County or similar government subdivision: \_\_\_\_\_

Latitude/Longitude (Use one of three possible formats, and specify method)

- |          |   |           |   |
|----------|---|-----------|---|
| Latitude | 1. ___° ___' ___" N (degrees, minutes, seconds) | Longitude | 1. ___° ___' ___" W (degrees, minutes, seconds) |
|          | 2. ___° ___' ___" N (degrees, minutes, decimal) |           | 2. ___° ___' ___" W (degrees, minutes, decimal) |
|          | 3. ___° ___' ___" N (decimal)                   |           | 3. ___° ___' ___" W (decimal)                   |

Method: U.S.G.S. topographic map    EPA web site    GPS    Other:  
• If you used a U.S.G.S. topographic map, what was the scale:

Project Located in Indian country?    Yes    No  
If so, name of Reservation OR if not part of a Reservation, put "Not Applicable":

Estimated Project Start Date: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_    Estimated Project Completion Date: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
Month    Date    Year    Month    Date    Year

Estimated Area to be Disturbed (to the nearest quarter acre): \_\_\_\_\_ . \_\_\_\_\_





Instructions for Completing EPA Form 3510-13  
**Notice of Termination (NOT) of Coverage Under a NPDES General Permit for  
Storm Water Discharges Associated with Construction Activity**

NPDES FORM

THIS FORM REPLACES FORM 3517-7 (8-98)

Form Approved OMB Nos. 2040-0086 and 2040-0211

**Instructions for Completing Notice  
of Termination (NOT) Form**

**Who May File a NOT Form**

Permittees who are presently covered under the EPA-issued National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction Activity may submit a NOT form when final stabilization has been achieved on all portions of the site for which you are responsible; another operator has assumed control in accordance with Appendix G, Section 11.C of the General Permit over all areas of the site that have not been finally stabilized; coverage under an alternative NPDES permit has been obtained; or for residential construction only, temporary stabilization has been completed and the residence has been transferred to the homeowner.

"Final stabilization" means that all soil disturbing activities at the site have been completed and that a uniform perennial vegetative cover with a density of at least 70% of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed. See "final stabilization" definition in Appendix A of the Construction General Permit for further guidance where background native vegetation covers less than 100 percent of the ground, in arid or semi-arid areas, for individual lots in residential construction, and for construction projects on land used for agricultural purposes.

**Completing the Form**

Type or print, using uppercase letters, in the appropriate areas only. Please place each character between the marks. Abbreviate if necessary to stay within the number of characters allowed for each item. Use only one space for breaks between words, but not for punctuation marks unless they are needed to clarify your response. If you have any questions about this form, refer to [www.epa.gov/npdes/stormwater/cgp](http://www.epa.gov/npdes/stormwater/cgp) or telephone the Storm Water Notice Processing Center at (866) 352-7755. Please submit original document with signature in ink--DO NOT send copies.

**Section I. Permit Information**

Enter the existing NPDES Storm Water General Permit Tracking Number assigned to the project by EPA's Storm Water Notice Processing Center. If you do not know the permit tracking number, refer to [www.epa.gov/npdes/stormwater/cgp](http://www.epa.gov/npdes/stormwater/cgp) or contact the Storm Water Notice Processing Center at (866) 352-7755.

Indicate your reason for submitting this Notice of Termination by checking the appropriate box. Check only one:

*If final stabilization has been achieved on all portions of the site for which you are responsible check the corresponding box.*

*If another operator has assumed control according to Appendix G, Section 11.C over all areas of the site that have not been finally stabilized check the corresponding box.*

*If coverage under an alternative NPDES permit has been obtained check the corresponding box.*

*For residential construction only, if temporary stabilization has been completed and the residence has been transferred to the homeowner check the corresponding box.*

**Section II. Operator Information**

Provide the legal name of the person, firm, public organization, or any other entity that operates the project described in this application. The operator of the project is the legal entity that controls the site operation, rather than the site manager. Provide the employer identification number (EIN from the Internal Revenue Service IRS). If the applicant does not have an EIN enter "NA" in the space provided. Enter the complete address and telephone number of the operator. *Optional:* enter the fax number and e-mail address of the operator.

**Section III. Project/Site Information**

Enter the official or legal name and complete street address, including city, state, zip code, and county or similar government subdivision of the project or site. If the project or site lacks a street address, indicate the general location of the site (e.g., Intersection of State Highways 61 and 34). Complete site information must be provided for termination of permit coverage to be valid.

**Section IV. Certification**

All applications, including NOIs, must be signed as follows:  
*For a corporation:* By a responsible corporate officer. For the purpose of this Part, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

*For a partnership or sole proprietorship:* By a general partner or the proprietor, respectively; or

*For a municipality, state, federal, or other public agency:* By either a principal executive officer or ranking elected official. For purposes of this Part, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

Include the name and title of the person signing the form and the date of signing. An unsigned or undated NOT form will not be considered valid termination of permit coverage.

**Paperwork Reduction Act Notice**

Public reporting burden for this application is estimated to average 0.5 hours per notice, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments regarding the burden estimate, any other aspect of the collection of information, or suggestions for improving this form including any suggestions which may increase or reduce this burden to: Chief, Information Policy Branch, 2136, U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue, NW, Washington, DC 20460. Include the OMB number on any correspondence. Do not send the completed form to this address.



### III. Rainfall Erosivity Factor Calculation Data

Project Start Date:  /  /   
Month Day Year

Project Completion Date:  /  /   
Month Day Year

Are interim non-vegetative site stabilization measures used to establish the project completion date for purposes of obtaining this waiver?  Yes  No

Rainfall erosivity factor (R factor): \_\_\_\_ . \_\_\_\_

*Note: To qualify for this waiver, the construction activity must take place during a period when the R factor is less than five.*

Rainfall erosivity factor was calculated by using:  Online calculator  EPA Fact Sheet 3-1  USDA Handbook 703

### IV. Operator Certification

I certify under penalty of law that: (1) construction activity at the project or site specified in Part II shall disturb less than five acres and shall take place during a period when the rainfall erosivity factor is less than five, (2) final stabilization will be completed as defined in the Construction General Permit, and (3) this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. Further, if interim non-vegetative measures are used to establish the end of the construction period for the purposes of obtaining this waiver, I commit to periodically inspect and properly maintain the area until the criteria for final vegetative stabilization have been met.

Print Name:

Print Title:

Signature: \_\_\_\_\_ Date:  /  /   
Month Day Year

Email:



**Low Erosivity Waiver Certification**

NPDES Form

Form Approved OMB No. 2040-0211

**Who May Qualify for a Low Erosivity Waiver**

Under the National Pollutant Discharge Elimination System (NPDES) Program, operators of construction projects that result in land disturbances equal to or greater than one acre, including sites that are less than one acre but are part of a larger common plan of development or sale where there is a cumulative disturbance of at least one acre, are required to obtain coverage under an NPDES permit for stormwater discharges associated with construction activity. EPA may waive the otherwise applicable permit requirements for stormwater discharges from construction activities that disturb less than five acres if the construction activity will take place during a period when the rainfall erosivity factor (R factor) is less than five. More information on the low erosivity waiver is available on the web in the Construction Rainfall Erosivity Waiver Fact Sheet at [www.epa.gov/npdes/pubs/fact3-1.pdf](http://www.epa.gov/npdes/pubs/fact3-1.pdf) and can be accessed from [www.epa.gov/npdes/cgp](http://www.epa.gov/npdes/cgp). For questions related to completion of this form, you may contact EPA's Stormwater Notice Processing Center toll free at 1-866-352-7755.

**Completing the Form**

Type or print, using uppercase letters, in the appropriate areas only. Please place each character between the marks. Abbreviate if necessary to stay within the number of characters allowed for each item. Use only one space for breaks between words, but not for punctuation marks unless they are needed to clarify your response. **Please submit the original form with a signature in ink. EPA will not accept a photocopied signature.**

**Section I. Operator Information**

Each legal entity that meets EPA's definition of "operator" (see definitions in Appendix A of EPA's NPDES Construction General Permit) and that meets the eligibility conditions for the low erosivity waiver must file this form to have the permit requirements waived. The operator is the legal entity that either (1) has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications, or (2) has day-to-day operational control of some or all of those activities. It is possible that there will be more than one operator at a site and, in such cases, each entity that meets the operator definition must complete a Low Erosivity Waiver Certification. Provide the legal name of your firm, public organization, or other entity that operates the project described in this waiver certification. Usually this will be a company or organization's name but for construction activities undertaken by you as an individual, this should be your name. Provide the operator's Internal Revenue Service (IRS) employer identification number (EIN), commonly referred to as the "taxpayer ID." If you are completing this form as an individual (i.e., not representing a company or organization), enter "NA" in the space provided for EIN. Enter the operator's complete mailing address and name of contact person who can answer questions about the site (e.g., a project or site manager) and their telephone number. *Optional:* to facilitate communication, provide a fax number and email address for the contact person.

To determine whether EPA is the permitting authority for the construction project, and thus has authority to waive the otherwise applicable requirements of the Construction General Permit, it is necessary to know whether the project is located in Indian country, is a federal facility or part of a federal facility; and to answer the other three questions on projects located in Oklahoma and Texas.

**Section II. Construction Project/Site Information**

Enter the official or legal name and complete street address, including city, state, zip code, and county or similar government subdivision of the project or site. If the project lacks a street address, indicate the general location of the site (e.g., intersection of State Highways 61 and 34).

The applicant must also provide the latitude and longitude of the approximate center of the project/site using one of three formats given in the form. The latitude and longitude of your facility can be determined from several sources, including global positioning system (GPS) receivers, U.S. Geological Survey (USGS) topographic or quadrangle maps, and EPA's web-based siting tool, among others. Information on using these methods to find your construction site's latitude and longitude is available on the web at [www.epa.gov/npdes/cgp](http://www.epa.gov/npdes/cgp). This web page describes EPA's web-based siting tool, which combines interactive maps and aerial photographs to help find your construction site's latitude and longitude. Specify which source you used to determine latitude and longitude. If a USGS topographic map is used, specify the scale of the map used.

Enter the horizontal reference datum for your latitude and longitude. The 1927 North American Datum (NAD 27) is a set of ellipsoid constants that describe the earth's shape and are used to calculate locations on the earth's latitude-longitude grid. This 1927 datum provides the mathematical basis for latitude and longitude coordinates on most USGS topographic maps. However, this datum is being phased out. Latitude and longitude on new or revised maps are now being calculated using the 1983 North American Datum (NAD 83), which is based on a newer definition of the earth ellipsoid. The World Geodetic System datum (WGS 84) was developed for the Department of Defense (DOD), who wanted a new coordinate system for the entire earth not just North America. DOD was willing to sacrifice a little accuracy in North America to get a better world system. For our purposes we don't have to be concerned about WGS 84 to NAD 83 coordinate conversions because the differences are negligible. The horizontal reference datum used on USGS topographic maps is shown on the bottom left corner of USGS topographic maps; it is also available for GPS receivers; but it is not provided on EPA's web-based siting tool. If you use EPA's web siting tool, please check the "unknown" box. NAD 83 is the most accurate reference datum and, as such, is preferred.

Enter the area (estimated to the nearest quarter acre) to be disturbed including, but not limited to: grubbing, excavation, grading, and utilities and infrastructure installation. Note: 1 acre = 43,560 sq. ft.

**Section III. Rainfall Erosivity Factor Calculation Data**

The construction period begins with the initial earth disturbance and ends with final site stabilization. To qualify for this waiver, the rainfall erosivity factor for the project must be less than five during the entire construction period. Specify the construction period by entering the project start date (date of initial earth disturbance) and project completion date (date of final site stabilization). For example, a grading contractor that is operating on-site for only one week during a nine month construction project, must enter the start date and completion date of the entire nine month construction period.

**Low Erosivity Waiver Certification**

NPDES Form

Form Approved OMB No. 2040-0211

EPA believes, where the environmental threat is low (i.e., in arid and semi-arid climates), that "final stabilization" can include techniques that employ re-vegetation combined with other stabilization measures, consisting of temporary degradable rolled erosion control products, also known as "erosion control blankets (ECBs). With proper selection, design, and installation of the combination re-vegetation/ECB technique in arid or semi-arid areas, an operator can be considered to have achieved final stabilization upon completion of the installation process. Note that if more than three years is required to establish 70 percent of the natural vegetative cover, this technique cannot be used or cited for fulfillment of the final stabilization requirement. If your waiver is based on use of interim non-vegetative stabilization measures, such as erosion control blankets, to establish the end of the construction period, you must indicate so on this form. In doing so, you must commit and certify (as a condition of waiver eligibility) to periodically inspect and properly maintain the area until the criteria for final stabilization, as defined in the Construction General Permit, have been met.

The rainfall erosivity factor "R" is determined in accordance with the U.S. Department of Agriculture *Agriculture Handbook Number 703, Predicting Soil Erosion by Water: A Guide to Conservation Planning with the Revised Universal Soil Loss Equation (RUSLE)*, Chapter 2 pages 21-64, dated January 1997. EPA's Construction Rainfall Erosivity Waiver Fact Sheet (EPA 833-F-00-014), available online at [www.epa.gov/npdes/pubs/fact3-1.pdf](http://www.epa.gov/npdes/pubs/fact3-1.pdf), defines rainfall erosivity and provides numerical examples showing how to calculate your rainfall erosivity factor. You may use the fact sheet approach or the online rainfall erosivity factor calculator available at: <http://ei.tamu.edu> to calculate your rainfall erosivity factor for your project.

If the R factor is five or greater during the project's construction period, you must have or obtain coverage under an NPDES stormwater permit. If the project was eligible for the waiver during the original construction period, but the construction activity will extend past the project completion date specified in the Low Erosivity Waiver Certification, the operator must recalculate the R factor using the original start date and a new project completion date. If the recalculated R factor is still less than five, a new waiver certification form must be submitted before the end of the original construction period. If the new R factor is five or greater, the operator must submit a Notice of Intent to be covered by the Construction General Permit before the original project completion date. The Notice of Intent (NOI) form may be submitted electronically using EPA's eNOI system at [www.epa.gov/npdes/enoi](http://www.epa.gov/npdes/enoi) or submitted by mailing the paper NOI form (EPA Form 3510-9) available on the EPA website at [www.epa.gov/npdes/cgp](http://www.epa.gov/npdes/cgp).

**Section IV. Operator Certification**

All Low Erosivity Waiver Certification forms must be signed as follows:

*For a corporation:* By a responsible corporate officer. For the purpose of this Section, a responsible corporate officer means: (i) president, secretary, treasurer, or vice president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management

decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

*For a partnership or sole proprietorship:* By a general partner or the proprietor, respectively; or

*For a municipality, state, federal, or other public facility:* By either a principal executive officer or ranking elected official. For purposes of this Section, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

Include the name, title, and email address of the person signing the form and the signature date. An unsigned or undated Low Erosivity Waiver Certification will not be considered valid.

**Where to File This Form**

Low Erosivity Waiver Certification forms must be sent to one of the following two addresses.

Regular U.S. Mail Delivery

EPA Stormwater Notice  
Processing Center  
Mail Code 4203M  
U.S. EPA  
1200 Pennsylvania Avenue, NW  
Washington, DC 20460

Overnight/Express Mail Delivery

EPA Stormwater Notice  
Processing Center  
Room 7420  
U.S. EPA  
1201 Constitution Avenue, NW  
Washington, DC 20004

Please submit the original form with a signature in ink. Do not send a photocopied signature!

**Paperwork Reduction Act Notice**

Public reporting burden for this certification form is estimated to average 1.0 hours. This estimate includes time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments regarding the burden estimate, any other aspect of the collection of information, or suggestions for improving this form, including any suggestions which may increase or reduce this burden to: Chief, Information Strategies Branch (2822T), U.S. Environmental Protection, Agency, 1200 Pennsylvania Avenue, NW, Washington, D.C. 20460. Include the OMB control number on any correspondence. Do not send the completed form to this address.

# NPDES General Permit for Storm Water Discharges From Construction Activities

## Table of Contents

As modified effective January 21, 2005

<b>COVER PAGE</b> .....	<b>1</b>
<b>PART 1: COVERAGE UNDER THIS PERMIT</b> .....	<b>2</b>
1.1 Introduction.....	2
1.2 Permit Area .....	2
1.3 Eligibility .....	2
1.4 Waivers for Certain Small Construction Activities.....	5
<b>PART 2: AUTHORIZATION FOR DISCHARGES OF STORM WATER FROM CONSTRUCTION ACTIVITY</b> .....	<b>5</b>
2.1 Authorization to Discharge Date .....	5
2.2 Notice of Intent Contents.....	5
2.3 Submission Deadlines.....	6
2.4 Where to Submit.....	7
<b>PART 3: STORM WATER POLLUTION PREVENTION PLANS (SWPPPS)</b> .....	<b>7</b>
3.1 Storm Water Pollution Prevention Plan Framework.....	7
3.2 Requirements for Different Types of Operators .....	7
3.3 Pollution Prevention Plan Contents: Site and Activity Description.....	8
3.4 Pollution Prevention Plan Contents: Controls to Reduce Pollutants.....	9
3.5 Non-Storm Water Discharge Management.....	9
3.6 Maintenance of Controls .....	9
3.7 Documentation of Permit Eligibility Related to Endangered Species .....	10
3.8 Copy of Permit Requirements .....	10
3.9 Applicable State, Tribal, or Local Programs.....	10
3.10 Inspections .....	10
3.11 Maintaining an Updated Plan .....	11
3.12 Signature, Plan Review and Making Plans Available .....	12
3.13 Management Practices .....	12
3.14 Documentation of Permit Eligibility Related to Total Maximum Daily Loads .....	13
<b>PART 4: SPECIAL CONDITIONS, MANAGEMENT PRACTICES AND OTHER NON-NUMERIC LIMITATIONS</b> .....	<b>13</b>
4.1 Continuation of the Expired General Permit .....	13
4.2 Requiring an Individual Permit or an Alternative General Permit .....	14
4.3 Releases in Excess of Reportable Quantities.....	14
4.4 Spills.....	14
4.5 Attainment of Water Quality Standards After Authorization .....	15
<b>PART 5: TERMINATION OF COVERAGE</b> .....	<b>15</b>
5.1 Requirements .....	15
5.2 Submitting a Notice of Termination.....	15
5.3 Where to Submit.....	16
<b>PART 6: RETENTION OF RECORDS</b> .....	<b>16</b>

<b>PART 7: REOPENER CLAUSE .....</b>	<b>16</b>
7.1 Procedures for Modification or Revocation .....	16
7.2 Water Quality Protection .....	16
7.3 Timing of Permit Modification.....	16
<b>PART 8: STANDARD PERMIT CONDITIONS.....</b>	<b>16</b>
<b>PART 9: PERMIT CONDITIONS APPLICABLE TO SPECIFIC STATES, INDIAN COUNTRY, OR TERRITORIES .....</b>	<b>16</b>

**APPENDICES**

Appendix A - Definitions and Acronyms .....	A-1
Appendix B - Permit Areas Eligible for Coverage.....	B-1
Appendix C - Endangered Species Act Review Procedures.....	C-1
Appendix D - Small Construction Waivers and Instructions.....	D-1
Appendix E - Notice of Intent Form and Instructions.....	E-1
Appendix F - Notice of Termination Form and Instructions.....	F-1
Appendix G - Standard Permit Conditions .....	G-1

**National Pollutant Discharge Elimination System  
General Permit for Discharges from  
Large and Small Construction Activities**

In compliance with the provisions of the Clean Water Act, 33 U.S.C. §1251 *et. seq.*, (hereafter CWA or the Act), as amended by the Water Quality Act of 1987, P.L. 100-4, operators of large and small construction activities that are described in Subpart 1.3 of this National Pollutant Discharge Elimination System (NPDES) general permit, except for those activities excluded from authorization of discharge in Subpart 1.3.C of this permit are authorized to discharge pollutants to waters of the United States in accordance with the conditions and requirements set forth herein. Permit coverage is required from the "commencement of construction activities" until "final stabilization" as defined in Appendix A.

This permit shall become effective on July 1, 2003.

This permit and the authorization to discharge shall expire at midnight, July 1, 2008.

Signed:

Linda M. Murphy, Director, Office of Ecosystem Protection  
EPA Region 1

Kevin Bricke, Acting Director, Division of Environmental Planning and Protection  
EPA Region 2

Carlos E. O'Neill, P.E., Acting Division Director, Caribbean Environmental Protection Division  
EPA Region 2

John M. Capacasa, Director, Water Protection Division  
EPA Region 3

Rebecca Harvey, Chief, NPDES Program Branch  
EPA Region 5

Miguel I. Flores, Director, Water Quality Protection Division  
EPA Region 6

Leo J. Alderman, Director, Water, Wetlands, and Pesticides Division  
EPA Region 7

Stephen S. Tuber, Assistant Regional Administrator, Office of Partnerships and Regulatory Assistance  
EPA Region 8

Nancy Woo, Acting Director, Water Division  
EPA Region 9

Randall F. Smith, Director, Office of Water  
EPA Region 10

The signatures are for the permit conditions in Parts 1 through 9 and Appendices A through G and for any additional conditions which apply to facilities located in the corresponding state, Indian country, or other area.

## PART 1: COVERAGE UNDER THIS PERMIT

### 1.1 Introduction

This Construction General Permit (CGP) authorizes storm water discharges from large and small construction activities that result in a total land disturbance of equal to or greater than one acre, where those discharges enter surface waters of the United States or a municipal separate storm sewer system (MS4) leading to surface waters of the United States subject to the conditions set forth in this permit. This permit also authorizes storm water discharges from any other construction activity designated by EPA where EPA makes that designation based on the potential for contribution to an excursion of a water quality standard or for significant contribution of pollutants to waters of the United States. This permit replaces two permits issued in 1998 (63 FR 7858, February 17, 1998 for EPA Regions 1, 2, 3, 7, 8, 9, and 10 and 63 FR 36489, July 6, 1998 for EPA Region 6). Any references to the 1998 CGP in this permit refer to those two permits.

This permit is presented in a reader-friendly, plain language format. This permit uses the terms "you" and "your" to identify the person(s) who owns or operates a "facility" or "activity" as defined in Appendix A and who must comply with the conditions of this permit. This format should allow you, the permittee and operator of a large or small construction activity, to easily locate and understand applicable requirements.

The goal of this permit is to reduce or eliminate storm water pollution from construction activity by requiring that you plan and implement appropriate pollution control practices to protect water quality.

### 1.2 Permit Area

If your large or small construction activity is located within the areas listed in Appendix B, you may be eligible to obtain coverage under this permit. Permit coverage is actually provided by legally separate and distinctly numbered permits covering each of the areas listed in Appendix B.

### 1.3 Eligibility

Permit eligibility is limited to discharges from "large" and "small" construction activity as defined in Appendix A or as otherwise designated by EPA. This general permit contains eligibility restrictions, as well as permit conditions and requirements. You may have to take certain actions to be eligible for coverage under this permit. In such cases, you must continue to satisfy those eligibility provisions to maintain permit authorization. If you do not meet the requirements that are a pre-condition to eligibility, then resulting discharges constitute unpermitted discharges. By contrast, if you do not comply with the requirements of the general permit, you may be in violation of the general permit for your otherwise eligible discharges.

#### A. Allowable Storm Water Discharges

Subject to compliance with the terms and conditions of this permit, you are authorized to discharge pollutants in:

1. Storm water associated with large and small construction activity as defined in Appendix A;
2. Storm water discharges designated by EPA as needing a storm water permit under 40 CFR §122.26(a)(1)(v) or §122.26(b)(15)(ii);
3. Discharges from support activities (e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, borrow areas) provided:
  - a. The support activity is directly related to the construction site required to have NPDES permit coverage for discharges of storm water associated with construction activity;
  - b. The support activity is not a commercial operation serving multiple unrelated construction projects by different operators, and does not operate beyond the completion of the construction activity at the last construction project it supports; and
  - c. Appropriate controls and measures are identified in a Storm Water Pollution Prevention Plan (SWPPP) covering the discharges from the support activity areas; and
4. Discharges composed of allowable discharges listed in 1.3.A and 1.3.B commingled with a discharge authorized by a different NPDES permit and/or a discharge that does not require NPDES permit authorization.

**B. Allowable Non-Storm Water Discharges**

You are authorized for the following non-storm water discharges, provided the non-storm water component of the discharge is in compliance with Subpart 3.5 (Non-Storm Water Discharge Management):

1. Discharges from fire-fighting activities;
2. Fire hydrant flushings;
3. Waters used to wash vehicles where detergents are not used;
4. Water used to control dust in accordance with Subpart 3.4.G;
5. Potable water including uncontaminated water line flushings;
6. Routine external building wash down that does not use detergents;
7. Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used;
8. Uncontaminated air conditioning or compressor condensate;
9. Uncontaminated ground water or spring water;
10. Foundation or footing drains where flows are not contaminated with process materials such as solvents;
11. Uncontaminated excavation dewatering;
12. Landscape irrigation.

**C. Limitations on Coverage**

1. This permit does not authorize post-construction discharges that originate from the site after construction activities have been completed and the site has achieved final stabilization, including any temporary support activity. Post-construction storm water discharges from industrial sites may need to be covered by a separate NPDES permit.
2. This permit does not authorize discharges mixed with non-storm water. This exclusion does not apply to discharges identified in Subpart 1.3.B, provided the discharges are in compliance with Subpart 3.5 (Non-Storm Water Discharge Management).
3. This permit does not authorize storm water discharges associated with construction activity that have been covered under an individual permit or required to obtain coverage under an alternative general permit in accordance with Subpart 4.2.
4. This permit does not authorize discharges that EPA, prior to authorization under this permit, determines will cause, have the reasonable potential to cause, or contribute to an excursion above any applicable water quality standard. Where such a determination is made prior to authorization, EPA may notify you that an individual permit application is necessary in accordance with Subpart 4.2. However, EPA may authorize your coverage under this permit after you have included appropriate controls and implementation procedures in your SWPPP designed to bring your discharge into compliance with water quality standards.
5. *Discharging into Receiving Waters With an Approved Total Maximum Daily Load Analysis*
  - a. You are not eligible for coverage under this permit for discharges of pollutants of concern to waters for which there is a total maximum daily load (TMDL) established or approved by EPA unless you incorporate into your SWPPP measures or controls that are consistent with the assumptions and requirements of such TMDL. To be eligible for coverage under this general permit, you must incorporate into your SWPPP any conditions applicable to your discharges necessary for consistency with the assumptions and requirements of such TMDL. If a specific wasteload allocation has been established that would apply to your discharge, you must incorporate that allocation into your SWPPP and implement necessary steps to meet that allocation.
  - b. In a situation where an EPA-approved or established TMDL has specified a general wasteload allocation applicable to construction storm water discharges, but no specific requirements for construction sites have been identified in the TMDL, you should consult with the State or Federal TMDL authority to confirm that adherence to a SWPPP that meets the requirements of the CGP will be consistent with the approved TMDL. Where an EPA-approved or established TMDL has not

specified a wasteload allocation applicable to construction storm water discharges, but has not specifically excluded these discharges, adherence to a SWPPP that meets the requirements of the CGP will generally be assumed to be consistent with the approved TMDL. If the EPA-approved or established TMDL specifically precludes such discharges, the operator is not eligible for coverage under the CGP.

6. *Endangered and Threatened Species and Critical Habitat Protection*

- a. Coverage under this permit is available only if your storm water discharges, allowable non-storm water discharges, and storm water discharge-related activities, as defined in Appendix A, are not likely to jeopardize the continued existence of any species that are federally-listed as endangered or threatened ("listed") under the Endangered Species Act (ESA) or result in the adverse modification or destruction of habitat that is federally-designated as critical under the ESA ("critical habitat").
- b. You are not eligible to discharge if the storm water discharges, allowable non-storm water discharges, or storm water discharge-related activities would cause a prohibited "take" of federally-listed endangered or threatened species (as defined under section 3 of the ESA and 50 CFR 17.3), unless such takes are authorized under sections 7 or 10 of the ESA.
- c. **Determining Eligibility:** You must use the process in Appendix C (ESA Review Procedures) to determine eligibility *PRIOR* to submittal of the Notice of Intent (NOI). You must meet one or more of the following six criteria (A-F) for the entire term of coverage under the permit:

- Criterion A. No federally-listed threatened or endangered species or their designated critical habitat are in the project area as defined in Appendix C; or
- Criterion B. Formal consultation with the Fish and Wildlife Service and/or the National Marine Fisheries Service under section 7 of the ESA has been concluded and that consultation:
- i. Addressed the effects of the project's storm water discharges, allowable non-storm water discharges, and storm water discharge-related activities on federally-listed threatened or endangered species and federally-designated critical habitat, and
  - ii. The consultation resulted in either:
    - a. Biological opinion finding no jeopardy to federally-listed species or destruction/adverse modification of federally-designated critical habitat, or
    - b. written concurrence from the Service(s) with a finding that the storm water discharges, allowable non-storm water discharges, and storm water discharge-related activities are not likely to adversely affect federally-listed species or federally-designated critical habitat; or
- Criterion C. Informal consultation with the Fish and Wildlife Service and/or the National Marine Fisheries Service under section 7 of the ESA has been concluded and that consultation:
- i. Addressed the effects of the project's storm water discharges, allowable non-storm water discharges, and storm water discharge-related activities on federally-listed threatened or endangered species and federally-designated critical habitat, and
  - ii. The consultation resulted in either:
    - a. Biological opinion finding no jeopardy to federally-listed species or destruction/adverse modification of federally-designated critical habitat, or
    - b. written concurrence from the Service(s) with a finding that the storm water discharges, allowable non-storm water discharges, and storm water discharge-related activities are not likely to adversely affect federally-listed species or federally-designated critical habitat; or
- Criterion D. The construction activities are authorized through the issuance of a permit under section 10 of the ESA, and that authorization addresses the effects of the storm water discharges, allowable non-storm water discharges, and storm water discharge-related activities on federally-listed species and federally-designated critical habitat; or
- Criterion E. Storm water discharges, allowable non-storm water discharges, and storm water discharge-related activities are not likely to adversely affect any federally-listed



threatened or endangered species or result in the destruction or adverse modification of federally-designated critical habitat; or

- Criterion F. The project's storm water discharges, allowable non-storm water discharges, and storm water discharge-related activities were already addressed in another operator's valid certification of eligibility under Criteria A-E which included your construction activities and there is no reason to believe that federally-listed species or federally-designated critical habitat not considered in the prior certification may be present or located in the project area. By certifying eligibility under this criterion, you agree to comply with any measures or controls upon which the other operator's certification was based.

You must comply with any applicable terms, conditions, or other requirements developed in the process of meeting the eligibility requirements of the criteria in this section to remain eligible for coverage under this permit. Such terms and conditions must be documented and incorporated into your SWPPP.

#### 7. Historic Properties

*[Reserved]*

You are reminded that you must comply with applicable state, tribal and local laws concerning the protection of historic properties and places.

#### 1.4 Waivers for Certain Small Construction Activities

Three scenarios exist under which small construction activities (see definition in Appendix A) may be waived from the NPDES permitting requirements detailed in this general permit. These exemptions are predicated on certain criteria being met and proper notification procedures being followed. Details of the waiver options and procedures for requesting a waiver are provided in Appendix D.

### PART 2: AUTHORIZATION FOR DISCHARGES OF STORM WATER FROM CONSTRUCTION ACTIVITY

To obtain coverage under this general permit, you, the operator, must prepare and submit a complete and accurate Notice of Intent (NOI), as described in this Part. Discharges are not authorized if your NOI is incomplete or inaccurate or if you were never eligible for permit coverage.

#### 2.1 Authorization to Discharge Date

This permit is effective as of the publication date in the Federal Register and is effective for five years, expiring at midnight on the anniversary of publication in the fifth year.

- A. If you submit an NOI during the first 90 days after the issuance date of this permit you are authorized to discharge storm water from construction activities under the terms and conditions of this permit seven (7) calendar days after submittal to EPA of a complete and accurate NOI (i.e., 7 days from date of postmark), except as noted in Subpart 2.1.C.
- B. If you submit an NOI after the first 90 days of this permit and prior to the expiration date of this permit, you are authorized to discharge storm water from construction activities under the terms and conditions of this permit seven (7) calendar days after acknowledgment of receipt of your complete NOI is posted on EPA's NPDES website <http://www.epa.gov/npdes/stormwater/cgp>, except as noted in Subpart 2.1.C.
- C. EPA may delay your authorization based on eligibility considerations of Subpart 1.3 (e.g., ESA concerns). In these instances, you are not authorized for coverage under this permit until you receive notice from EPA of your eligibility.

#### 2.2 Notice of Intent Contents

- A. You must use the NOI form provided in Appendix E (or a photocopy thereof) and available at [www.epa.gov/npdes/stormwater/cgp](http://www.epa.gov/npdes/stormwater/cgp). If EPA makes other NOI forms available (either directly, by public notice, or by making information available on the Internet), you may take advantage of any of those options to satisfy the NOI use requirements of this Subpart.
- B. You must provide the following information on the NOI form:
  1. The applicable permit number for which you are requesting coverage (See Appendix B);

2. Operator name, address, telephone number, and Employer Identification Number (EIN) as established by the U.S. Internal Revenue Service;
3. Project/Site name, address, county or similar governmental subdivision, and latitude/longitude of your construction project or site;
4. Whether your site is located in Indian country and if so, the name of the Reservation, if applicable;
5. Whether the SWPPP has been prepared in advance of filing of this NOI and the location where the applicable SWPPP may be viewed;
6. Name of the water(s) of the U.S. into which your site discharges;
7. Indication whether your discharge is consistent with the assumptions and requirements of applicable EPA approved or established TMDLs;
8. Estimated dates of commencement of construction activity and final stabilization (i.e., project start and completion dates);
9. Total acreage (to the nearest quarter acre) to be disturbed for which you are requesting permit coverage;
10. Whether any federally-listed threatened or endangered species, or federally-designated critical habitat are in your project area to be covered by this permit, and the basis for certifying eligibility for permit coverage based on the instructions in Appendix C;
11. A certification statement, signed and dated by an authorized representative as defined in Appendix G, Section 11, and the name and title of that authorized representative.

### 2.3 Submission Deadlines

- A. *New Projects*: To obtain coverage under this permit, you must submit a complete and accurate NOI and be authorized consistent with Subpart 2.1 prior to your commencement of construction activities.
- B. *Permitted Ongoing Projects (only applicable for first 90 days after this permit is issued)*: If you previously received authorization to discharge for your project under the 1998 CGP and you wish to continue coverage under this permit:
  1. Except as noted in 2.3.B.2, you must:
    1. Submit an NOI within 90 days of the issuance date of this permit, and
    2. Until you are authorized under this permit consistent with Subpart 2.1, comply with the terms and conditions of the 1998 CGP under which you were previously authorized.
  2. If you meet the termination of coverage requirements in accordance with Subpart 5.1 within 90 days of the issuance date of this permit (e.g., construction will be finished and final stabilization achieved) you must:
    1. Submit an NOT consistent with the 2003 CGP using the NOT form provided in Appendix F, and
    2. Until coverage is no longer required, comply with the terms and conditions of the 1998 CGP under which you were previously authorized.
- C. *Unpermitted Ongoing Projects (only applicable for first 90 days after this permit is issued)*: If you previously did not receive authorization to discharge for your project under the 1998 CGP and you wish to obtain coverage under this permit:
  1. Except as noted in 2.3.C.2, you must:
    1. Submit an NOI within 90 days of the issuance date of this permit, and
    2. Until you are authorized under this permit consistent with Subpart 2.1, comply with an interim Storm Water Pollution Prevention Plan (SWPPP) consistent with the 1998 CGP.
  2. If you meet the termination of coverage requirements in accordance with Subpart 5.1 within 90 days of the issuance date of this permit (e.g., construction will be finished and final stabilization achieved) you must comply with an interim Storm Water Pollution Prevention Plan (SWPPP) consistent with the 1998 CGP until permit coverage is no longer required.

- D. *Late Notifications*: Operators are not prohibited from submitting NOIs after initiating clearing, grading, excavation activities, or other construction activities. When a late NOI is submitted, authorization for discharges occurs consistent with Subpart 2.1. The Agency reserves the right to take enforcement action for any unpermitted discharges or permit noncompliance that occur between the commencement of construction and discharge authorization.

## 2.4 Where to Submit

- A. Except as noted in Subpart 2.3.B, you must send your complete and accurate NOI to EPA at one of the following addresses:

For Regular U.S. Mail Delivery:

EPA Storm Water Notice Processing Center  
Mail Code 4203M  
U.S. EPA  
1200 Pennsylvania Avenue, NW  
Washington, DC 20460

For Overnight/Express Mail Delivery:

EPA Storm Water Notice Processing Center  
Room 7420  
U.S. EPA  
1201 Constitution Avenue, NW  
Washington, DC 20004

- B. In lieu of Subpart 2.4.A, when available, you may submit your NOI using EPA's electronic NOI system (i.e., eNOI) as detailed at [www.epa.gov/npdes/stormwater/cgp](http://www.epa.gov/npdes/stormwater/cgp).

## PART 3: STORM WATER POLLUTION PREVENTION PLANS (SWPPPS)

### 3.1 Storm Water Pollution Prevention Plan Framework

- A. A SWPPP must be prepared prior to submission of an NOI as required in Part 2. At least one SWPPP must be developed for each construction project covered by this permit and such SWPPP must be prepared in accordance with good engineering practices.
- B. The SWPPP must:
1. Identify all potential sources of pollution which may reasonably be expected to affect the quality of storm water discharges from the construction site;
  2. Describe practices to be used to reduce pollutants in storm water discharges from the construction site; and
  3. Assure compliance with the terms and conditions of this permit.
- C. Once a definable area has been finally stabilized, you may mark this on your SWPPP and no further SWPPP or inspection requirements apply to that portion of the site (e.g., earth-disturbing activities around one of three buildings in a complex are done and the area is finally stabilized, one mile of a roadway or pipeline project is done and finally stabilized, etc).
- D. You must implement the SWPPP as written from commencement of construction activity until final stabilization is complete.

### 3.2 Requirements for Different Types of Operators

You may meet one or both of the operational control components in the definition of operator found in Appendix A. Subpart 3.2.C applies to all permittees having control over only a portion of a construction site.

- A. If you have operational control over construction plans and specifications, you must ensure that:
1. The project specifications meet the minimum requirements of this Subpart and all other applicable permit conditions;
  2. The SWPPP indicates the areas of the project where the operator has operational control over project specifications, including the ability to make modifications in specifications;
  3. All other permittees implementing portions of the SWPPP (or their own SWPPP) who may be impacted by a change to the construction plan are notified of such changes in a timely manner; and
  4. The SWPPP indicates the name of the party(ies) with day-to-day operational control of those activities necessary to ensure compliance with the SWPPP or other permit conditions.

- B. If you have operational control over day-to-day activities, you must ensure that:
1. The SWPPP meets the minimum requirements of this Subpart and identifies the parties responsible for implementation of control measures identified in the plan;
  2. The SWPPP indicates areas of the project where you have operational control over day-to-day activities;
  3. The SWPPP indicates the name of the party(ies) with operational control over project specifications (including the ability to make modifications in specifications).
- C. If you have operational control over only a portion of a larger project (e.g., one of four homebuilders in a subdivision), you are responsible for compliance with all applicable terms and conditions of this permit as it relates to your activities on your portion of the construction site, including protection of endangered species, critical habitat, and historic properties, and implementation of best management practices (BMPs) and other controls required by the SWPPP. You must ensure either directly or through coordination with other permittees, that your activities do not render another party's pollution control ineffective. You must either implement your portion of a common SWPPP or develop and implement your own SWPPP.

For more effective coordination of BMPs and opportunities for cost sharing, a cooperative effort by the different operators at a site to prepare and participate in a comprehensive SWPPP is encouraged. Individual operators at a site may, but are not required to, develop separate SWPPPs that cover only their portion of the project provided reference is made to other operators at the site. In instances where there is more than one SWPPP for a site, cooperation between the permittees is encouraged to ensure the storm water discharge controls and other measures are consistent with one another (e.g., provisions to protect listed species and critical habitat).

### 3.3 Pollution Prevention Plan Contents: Site and Activity Description

- A. The SWPPP must identify all operators for the project site, and the areas of the site over which each operator has control.
- B. The SWPPP must describe the nature of the construction activity, including:
1. The function of the project (e.g., low density residential, shopping mall, highway, etc.);
  2. The intended sequence and timing of activities that disturb soils at the site;
  3. Estimates of the total area expected to be disturbed by excavation, grading, or other construction activities, including dedicated off-site borrow and fill areas; and
  4. A general location map (e.g., USGS quadrangle map, a portion of a city or county map, or other map) with enough detail to identify the location of the construction site and waters of the United States within one mile of the site.
- C. The SWPPP must contain a legible site map, showing the entire site, identifying:
1. Direction(s) of storm water flow and approximate slopes anticipated after major grading activities;
  2. Areas of soil disturbance and areas that will not be disturbed;
  3. Locations of major structural and nonstructural BMPs identified in the SWPPP;
  4. Locations where stabilization practices are expected to occur;
  5. Locations of off-site material, waste, borrow or equipment storage areas;
  6. Locations of all waters of the United States (including wetlands);
  7. Locations where storm water discharges to a surface water; and
  8. Areas where final stabilization has been accomplished and no further construction-phase permit requirements apply.
- D. The SWPPP must describe and identify the location and description of any storm water discharge associated with industrial activity other than construction at the site. This includes storm water discharges from dedicated asphalt plants and dedicated concrete plants, that are covered by this permit.

### 3.4 Pollution Prevention Plan Contents: Controls to Reduce Pollutants

- A. The SWPPP must include a description of all pollution control measures (i.e., BMPs) that will be implemented as part of the construction activity to control pollutants in storm water discharges. For each major activity identified in the project description the SWPPP must clearly describe appropriate control measures, the general sequence during the construction process in which the measures will be implemented, and which operator is responsible for the control measure's implementation.
- B. The SWPPP must include a description of interim and permanent stabilization practices for the site, including a schedule of when the practices will be implemented. Site plans should ensure that existing vegetation is preserved where possible and that disturbed portions of the site are stabilized. Use of impervious surfaces for stabilization should be avoided.
- C. The following records must be maintained as part of the SWPPP:
  1. Dates when major grading activities occur;
  2. Dates when construction activities temporarily or permanently cease on a portion of the site; and
  3. Dates when stabilization measures are initiated.
- D. The SWPPP must include a description of structural practices to divert flows from exposed soils, retain/detain flows or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Placement of structural practices in floodplains must be avoided to the degree practicable.
- E. The SWPPP must include a description of all post-construction storm water management measures that will be installed during the construction process to control pollutants in storm water discharges after construction operations have been completed. Structural measures should be placed on upland soils to the degree practicable. Such measures must be designed and installed in compliance with applicable federal, local, state or tribal requirements.
- F. The SWPPP must describe measures to prevent the discharge of solid materials, including building materials, to waters of the United States, except as authorized by a permit issued under section 404 of the CWA.
- G. The SWPPP must describe measures to minimize, to the extent practicable, off-site vehicle tracking of sediments onto paved surfaces and the generation of dust.
- H. The SWPPP must include a description of construction and waste materials expected to be stored on-site with updates as appropriate. The SWPPP must also include a description of controls, including storage practices, to minimize exposure of the materials to storm water, and spill prevention and response practices.
- I. The SWPPP must include a description of pollutant sources from areas other than construction (including storm water discharges from dedicated asphalt plants and dedicated concrete plants), and a description of controls and measures that will be implemented at those sites to minimize pollutant discharges.

### 3.5 Non-Storm Water Discharge Management

The SWPPP must identify all allowable sources of non-storm water discharges listed in Subpart 1.3.B of this permit, except for flows from fire fighting activities, that are combined with storm water discharges associated with construction activity at the site. Non-storm water discharges should be eliminated or reduced to the extent feasible. The SWPPP must identify and ensure the implementation of appropriate pollution prevention measures for the non-storm water component(s) of the discharge.

### 3.6 Maintenance of Controls

- A. All erosion and sediment control measures and other protective measures identified in the SWPPP must be maintained in effective operating condition. If site inspections required by Subpart 3.10 identify BMPs that are not operating effectively, maintenance must be performed as soon as possible and before the next storm event whenever practicable to maintain the continued effectiveness of storm water controls.
- B. If existing BMPs need to be modified or if additional BMPs are necessary for any reason, implementation must be completed before the next storm event whenever practicable. If implementation before the next storm event is impracticable, the situation must be documented in the SWPPP and alternative BMPs must be implemented as soon as possible.
- C. Sediment from sediment traps or sedimentation ponds must be removed when design capacity has been reduced by 50 percent.

### 3.7 Documentation of Permit Eligibility Related to Endangered Species

The SWPPP must include documentation supporting a determination of permit eligibility with regard to Endangered Species, including:

- A. Information on whether federally-listed endangered or threatened species, or federally-designated critical habitat may be in the project area;
- B. Whether such species or critical habitat may be adversely affected by storm water discharges or storm water discharge-related activities from the project;
- C. Results of the Appendix C listed species and critical habitat screening determinations;
- D. Confirmation of delivery of NOI to EPA or to EPA's electronic NOI system. This may include an overnight, express or registered mail receipt acknowledgment; or electronic acknowledgment from EPA's electronic NOI system.
- E. Any correspondence for any stage of project planning between the U.S. Fish and Wildlife Service (FWS), EPA, the U.S. National Marine Fisheries Service (NMFS), or others and you regarding listed species and critical habitat, including any notification that delays your authorization to discharge under this permit;
- F. A description of measures necessary to protect federally-listed endangered or threatened species, or federally-designated critical habitat. The permittee must describe and implement such measures to maintain eligibility for coverage under this permit.

### 3.8 Copy of Permit Requirements

Copies of this permit and of the signed and certified NOI form that was submitted to EPA must be included in the SWPPP. Also, upon receipt, a copy of the letter from the EPA Storm Water Notice Processing Center notifying you of their receipt of your administratively complete NOI must also be included as a component of the SWPPP.

### 3.9 Applicable State, Tribal, or Local Programs

The SWPPP must be consistent with all applicable federal, state, tribal, or local requirements for soil and erosion control and storm water management, including updates to the SWPPP as necessary to reflect any revisions to applicable federal, state, tribal, or local requirements for soil and erosion control.

### 3.10 Inspections

- A. Inspections must be conducted in accordance with one of the two schedules listed below. You must specify in your SWPPP which schedule you will be following.
  1. At least once every 7 calendar days, OR
  2. At least once every 14 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater.
- B. Inspection frequency may be reduced to at least once every month if:
  1. The entire site is temporarily stabilized,
  2. Runoff is unlikely due to winter conditions (e.g., site is covered with snow, ice, or the ground is frozen), or
  3. Construction is occurring during seasonal arid periods in arid areas and semi-arid areas.
- C. A waiver of the inspection requirements is available until one month before thawing conditions are expected to result in a discharge if all of the following requirements are met:
  1. The project is located in an area where frozen conditions are anticipated to continue for extended periods of time (i.e., more than one month);
  2. Land disturbance activities have been suspended; and
  3. The beginning and ending dates of the waiver period are documented in the SWPPP.
- D. Inspections must be conducted by qualified personnel (provided by the operator or cooperatively by multiple operators). "Qualified personnel" means a person knowledgeable in the principles and practice of erosion and sediment controls who possesses the skills to assess conditions at the construction site that could impact

storm water quality and to assess the effectiveness of any sediment and erosion control measures selected to control the quality of storm water discharges from the construction activity.

- E. Inspections must include all areas of the site disturbed by construction activity and areas used for storage of materials that are exposed to precipitation. Inspectors must look for evidence of, or the potential for, pollutants entering the storm water conveyance system. Sedimentation and erosion control measures identified in the SWPPP must be observed to ensure proper operation. Discharge locations must be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to waters of the United States, where accessible. Where discharge locations are inaccessible, nearby downstream locations must be inspected to the extent that such inspections are practicable. Locations where vehicles enter or exit the site must be inspected for evidence of off-site sediment tracking.
- F. Utility line installation, pipeline construction, and other examples of long, narrow, linear construction activities may limit the access of inspection personnel to the areas described in Subpart 3.10.E above. Inspection of these areas could require that vehicles compromise temporarily or even permanently stabilized areas, cause additional disturbance of soils, and increase the potential for erosion. In these circumstances, controls must be inspected on the same frequencies as other construction projects, but representative inspections may be performed. For representative inspections, personnel must inspect controls along the construction site for 0.25 mile above and below each access point where a roadway, undisturbed right-of-way, or other similar feature intersects the construction site and allows access to the areas described above. The conditions of the controls along each inspected 0.25 mile segment may be considered as representative of the condition of controls along that reach extending from the end of the 0.25 mile segment to either the end of the next 0.25 mile inspected segment, or to the end of the project, whichever occurs first.
- G. For each inspection required above, you must complete an inspection report. At a minimum, the inspection report must include:
  - 1. The inspection date;
  - 2. Names, titles, and qualifications of personnel making the inspection;
  - 3. Weather information for the period since the last inspection (or since commencement of construction activity if the first inspection) including a best estimate of the beginning of each storm event, duration of each storm event, approximate amount of rainfall for each storm event (in inches), and whether any discharges occurred;
  - 4. Weather information and a description of any discharges occurring at the time of the inspection;
  - 5. Location(s) of discharges of sediment or other pollutants from the site;
  - 6. Location(s) of BMPs that need to be maintained;
  - 7. Location(s) of BMPs that failed to operate as designed or proved inadequate for a particular location;
  - 8. Location(s) where additional BMPs are needed that did not exist at the time of inspection; and
  - 9. Corrective action required including any changes to the SWPPP necessary and implementation dates.

A record of each inspection and of any actions taken in accordance with this Part must be retained as part of the SWPPP for at least three years from the date that permit coverage expires or is terminated. The inspection reports must identify any incidents of non-compliance with the permit conditions. Where a report does not identify any incidents of non-compliance, the report must contain a certification that the construction project or site is in compliance with the SWPPP and this permit. The report must be signed in accordance with Appendix G, Section 11 of this permit.

### 3.11 Maintaining an Updated Plan

- A. The SWPPP, including the site map, must be amended whenever there is a change in design, construction, operation, or maintenance at the construction site that has or could have a significant effect on the discharge of pollutants to the waters of the United States that has not been previously addressed in the SWPPP.
- B. The SWPPP must be amended if during inspections or investigations by site staff, or by local, state, tribal or federal officials, it is determined that the discharges the SWPPP is ineffective in eliminating or significantly minimizing pollutants in storm water discharges from the construction site.
- C. Based on the results of an inspection, the SWPPP must be modified as necessary to include additional or modified BMPs designed to correct problems identified. Revisions to the SWPPP must be completed within

seven (7) calendar days following the inspection. Implementation of these additional or modified BMPs must be accomplished as described in Subpart 3.6.B.

### 3.12 Signature, Plan Review and Making Plans Available

- A. A copy of the SWPPP (including a copy of the permit), NOI, and acknowledgement letter from EPA must be retained at the construction site (or other location easily accessible during normal business hours to EPA, a state, tribal or local agency approving sediment and erosion plans, grading plans, or storm water management plans; local government officials; the operator of a municipal separate storm sewer receiving discharges from the site; and representatives of the U.S. Fish and Wildlife Service or the National Marine Fisheries Service) from the date of commencement of construction activities to the date of final stabilization. If you have day-to-day operational control over SWPPP implementation, you must have a copy of the SWPPP available at a central location on-site for the use of all those identified as having responsibilities under the SWPPP whenever they are on the construction site. If an on-site location is unavailable to store the SWPPP when no personnel are present, notice of the plan's location must be posted near the main entrance at the construction site.
- B. A sign or other notice must be posted conspicuously near the main entrance of the construction site. If displaying near the main entrance is infeasible, the notice can be posted in a local public building such as the town hall or public library. The sign or other notice must contain the following information:
1. A copy of the completed Notice of Intent as submitted to the EPA Storm Water Notice Processing Center; and
  2. If the location of the SWPPP or the name and telephone number of the contact person for scheduling SWPPP viewing times has changed (i.e., is different than that submitted to EPA in the NOI), the current location of the SWPPP and name and telephone number of a contact person for scheduling viewing times.

For linear projects, the sign or other notice must be posted at a publicly accessible location near the active part of the construction project (e.g., where a pipeline project crosses a public road).

- C. SWPPPs must be made available upon request by EPA; a state, tribal or local agency approving sediment and erosion plans, grading plans, or storm water management plans; local government officials; the operator of a municipal separate storm sewer receiving discharges from the site; and representatives of the U.S. Fish and Wildlife Service or the National Marine Fisheries Service to the requestor. The copy of the SWPPP that is required to be kept on-site or locally available must be made available, in its entirety, to the EPA staff for review and copying at the time of an on-site inspection.
- D. All SWPPPs must be signed and certified in accordance with Appendix G, Section 11.

### 3.13 Management Practices

- A. All control measures must be properly selected, installed, and maintained in accordance with any relevant manufacturer specifications and good engineering practices. If periodic inspections or other information indicates a control has been used inappropriately, or incorrectly, the operator must replace or modify the control for site situations as soon as practicable.
- B. If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize off-site impacts.
- C. Litter, construction debris, and construction chemicals that could be exposed to storm water must be prevented from becoming a pollutant source in storm water discharges.
- D. Except as provided below, stabilization measures must be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased.
1. Where stabilization by the 14th day is precluded by snow cover or frozen ground conditions, stabilization measures must be initiated as soon as practicable.
  2. Where construction activity on a portion of the site is temporarily ceased, and earth disturbing activities will be resumed within 14 days, temporary stabilization measures do not have to be initiated on that portion of the site.



3. In arid, semiarid, and drought-stricken areas where initiating perennial vegetative stabilization measures is not possible within 14 days after construction activity has temporarily or permanently ceased, final vegetative stabilization measures must be initiated as soon as practicable.
- E. A combination of sediment and erosion control measures are required to achieve maximum pollutant removal.
1. Sediment Basins: For common drainage locations that serve an area with 10 or more acres disturbed at one time, a temporary (or permanent) sediment basin that provides storage for a calculated volume of runoff from the drainage area from a 2-year, 24-hour storm, or equivalent control measures, must be provided where attainable until final stabilization of the site. Where no such calculation has been performed, a temporary (or permanent) sediment basin providing 3,600 cubic feet of storage per acre drained, or equivalent control measures, must be provided where attainable until final stabilization of the site. When computing the number of acres draining into a common location, it is not necessary to include flows from offsite areas and flows from on-site areas that are either undisturbed or have undergone final stabilization where such flows are diverted around both the disturbed area and the sediment basin. In determining whether installing a sediment basin is attainable, the operator may consider factors such as site soils, slope, available area on-site, etc. In any event, the operator must consider public safety, especially as it relates to children, as a design factor for the sediment basin, and alternative sediment controls must be used where site limitations would preclude a safe design.
  2. For drainage locations which serve 10 or more disturbed acres at one time and where a temporary sediment basin or equivalent controls is not attainable, smaller sediment basins and/or sediment traps should be used. At a minimum, silt fences, vegetative buffer strips, or equivalent sediment controls are required for all down slope boundaries (and for those side slope boundaries deemed appropriate as dictated by individual site conditions).
  3. For drainage locations serving less than 10 acres, smaller sediment basins and/or sediment traps should be used. At a minimum, silt fences, vegetative buffer strips, or equivalent sediment controls are required for all down slope boundaries (and for those side slope boundaries deemed appropriate as dictated by individual site conditions) of the construction area unless a sediment basin providing storage for a calculated volume of runoff from a 2-year, 24-hour storm or 3,600 cubic feet of storage per acre drained is provided.
- F. Velocity dissipation devices must be placed at discharge locations and along the length of any outfall channel to provide a non-erosive flow velocity from the structure to a water course so that the natural physical and biological characteristics and functions are maintained and protected (e.g., no significant changes in the hydrological regime of the receiving water).

### 3.14 Documentation of Permit Eligibility Related to Total Maximum Daily Loads

The SWPPP must include documentation supporting a determination of permit eligibility with regard to waters that have an EPA-established or approved TMDL, including:

- A. Identification of whether your discharge is identified, either specifically or generally, in an EPA-established or approved TMDL and any associated allocations, requirements, and assumptions identified for your discharge;
- B. Summaries of consultation with State or Federal TMDL authorities on consistency of SWPPP conditions with the approved TMDL, and
- C. Measures taken by you to ensure that your discharge of pollutants from the site is consistent with the assumptions and requirements of the EPA-established or approved TMDL, including any specific wasteload allocation that has been established that would apply to your discharge.

See section 1.3.C.5 for further information on determining permit eligibility related to TMDLs.

## PART 4: SPECIAL CONDITIONS, MANAGEMENT PRACTICES AND OTHER NON-NUMERIC LIMITATIONS

### 4.1 Continuation of the Expired General Permit

If this permit is not reissued or replaced prior to the expiration date, it will be administratively continued in accordance with the Administrative Procedure Act and remain in force and effect. If you were granted permit coverage prior to the expiration date, you will automatically remain covered by the continued permit until the earliest of:

- A. Reissuance or replacement of this permit, at which time you must comply with the conditions of the new permit to maintain authorization to discharge; or
- B. Your submittal of a Notice of Termination; or
- C. Issuance of an individual permit for the project's discharges; or
- D. A formal permit decision by EPA to not reissue this general permit, at which time you must seek coverage under an alternative general permit or an individual permit.

#### 4.2 Requiring an Individual Permit or an Alternative General Permit

- A. EPA may require you to apply for and/or obtain either an individual NPDES permit or an alternative NPDES general permit. Any interested person may petition EPA to take action under this paragraph. If EPA requires you to apply for an individual NPDES permit, EPA will notify you in writing that a permit application is required. This notification will include a brief statement of the reasons for this decision and an application form. In addition, if you are an existing permittee covered under this permit, the notice will set a deadline to file the application, and will include a statement that on the effective date of issuance or denial of the individual NPDES permit or the alternative general permit as it applies to you, coverage under this general permit will automatically terminate. Applications must be submitted to EPA at the applicable EPA Regional offices listed in Appendix B of this permit. EPA may grant additional time to submit the application upon your request. If you are covered under this permit and you fail to submit in a timely manner an individual NPDES permit application as required by EPA, then the applicability of this permit to you is automatically terminated at the end of the day specified by EPA as the deadline for application submittal.
- B. You may request to be excluded from the coverage of this general permit by applying for an individual permit. In such a case, you must submit an individual application in accordance with the requirements of 40 CFR §122.26(c)(1)(ii), with reasons supporting the request, to EPA at the applicable EPA Regional office listed in Appendix B of this permit. The request may be granted by issuance of an individual permit or an alternative general permit if your reasons are adequate to support the request.
- C. When an individual NPDES permit is issued to you, who are otherwise subject to this permit, or you are authorized to discharge under an alternative NPDES general permit, the applicability of this permit to you is automatically terminated on the effective date of the individual permit or the date of authorization of coverage under the alternative general permit, whichever the case may be. If you, who are otherwise subject to this permit, are denied an individual NPDES permit or an alternative NPDES general permit, the applicability of this permit to you is automatically terminated on the date of such denial, unless otherwise specified by EPA.

#### 4.3 Releases in Excess of Reportable Quantities

The discharge of hazardous substances or oil in storm water discharges from the construction site must be prevented or minimized in accordance with the SWPPP. This permit does not relieve you of the federal reporting requirements of 40 CFR Part 110, 40 CFR Part 117 and 40 CFR Part 302 relating to spills or other releases of oils or hazardous substances.

Where a release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR Part 110, 40 CFR Part 117 or 40 CFR Part 302, occurs during a 24-hour period:

- you must provide notice to the National Response Center (NRC) (800 424 8802; in the Washington, DC, metropolitan area call 202 426 2675) in accordance with the requirements of 40 CFR Part 110, 40 CFR Part 117 and 40 CFR Part 302 as soon as site staff have knowledge of the discharge; and
- you must modify the SWPPP as required under Subpart 3.11 within 7 calendar days of knowledge of the release to: provide a description of the release, the circumstances leading to the release, and the date of the release. Plans must identify measures to prevent the reoccurrence of such releases and to respond to such releases.

#### 4.4 Spills

This permit does not authorize the discharge of hazardous substances or oil resulting from an on-site spill.

#### 4.5 Attainment of Water Quality Standards After Authorization

- A. You must select, install, implement and maintain BMPs at your construction site that minimize pollutants in the discharge as necessary to meet applicable water quality standards. In general, except in situations explained in Subpart 4.5.B below, your SWPPP developed, implemented, and updated consistent with Part 3.0 is considered as stringent as necessary to ensure that your discharges do not cause or contribute to an excursion above any applicable water quality standard.
- B. At any time after authorization, EPA may determine that your storm water discharges may cause, have reasonable potential to cause, or contribute to an excursion above any applicable water quality standard. If such a determination is made, EPA will require you to:
  - i. Develop a supplemental BMP action plan describing SWPPP modifications in accordance with Subpart 3.11 to address adequately the identified water quality concerns;
  - ii. Submit valid and verifiable data and information that are representative of ambient conditions and indicate that the receiving water is attaining water quality standards; or
  - iii. Cease discharges of pollutants from construction activity and submit an individual permit application according to Subpart 4.2.

All written responses required under this part must include a signed certification consistent with Appendix G, Section 11.

### PART 5: TERMINATION OF COVERAGE

#### 5.1 Requirements

You may only submit a Notice of Termination (NOT) after one or more of the following conditions have been met:

- A. Final stabilization has been achieved on all portions of the site for which you are responsible;
- B. Another operator has assumed control according to Appendix G, Section 11.C over all areas of the site that have not been finally stabilized;
- C. Coverage under an individual or alternative general NPDES permit has been obtained; or
- D. For residential construction only, temporary stabilization has been completed and the residence has been transferred to the homeowner.

The NOT must be submitted within 30 days of one of the above conditions being met. Authorization to discharge terminates at midnight of the day the NOT is signed.

#### 5.2 Submitting a Notice of Termination

It is your responsibility to submit a complete and accurate Notice of Termination (NOT), using the form provided in Appendix F (or a photocopy thereof) available at [www.epa.gov/npdes/stormwater/cgp](http://www.epa.gov/npdes/stormwater/cgp). If EPA notifies dischargers (either directly, by public notice, or by making information available on the Internet) of other NOT form options (e.g., electronic submission), you may take advantage of those options to satisfy the requirements of Part 5.

- A. The Notice of Termination must include the following information:
  - 1. The NPDES permit tracking number for the storm water discharge;
  - 2. The basis for submission of the NOT, including: final stabilization has been achieved on all portions of the site for which the permittee is responsible; another operator/permittee has assumed control over all areas of the site that have not been finally stabilized; coverage under an alternative NPDES permit has been obtained; or, for residential construction only, temporary stabilization has been completed and the residence has been transferred to the homeowner;
  - 3. You, the operator's name, address, telephone number and your organization's Employer Identification Number (EIN) as established by the U.S. Internal Revenue Service;
  - 4. The name of the project and address (or a description of location if no street address is available) of the construction site for which the notification is submitted; and
  - 5. A certification statement, signed and dated by an authorized representative as defined in Appendix G, Section 11 and the name and title of that authorized representative.

### 5.3 Where to Submit

A. All NOTs must be submitted to one of the following addresses:

For Regular U.S. Mail Delivery:

EPA Storm Water Notice Processing Center  
Mail Code 4203M  
U.S. EPA  
1200 Pennsylvania Avenue, NW  
Washington, DC 20460

For Overnight/Express Mail Delivery:

EPA Storm Water Notice Processing Center  
Room 7420  
U.S. EPA  
1201 Constitution Avenue, NW  
Washington, DC 20004

B. In lieu of Subpart 5.3.A, you can submit your NOT to EPA using EPA's electronic system (i.e., eNOI), when available. Check [www.epa.gov/npdes/stormwater/cgp](http://www.epa.gov/npdes/stormwater/cgp) for updates.

### PART 6: RETENTION OF RECORDS

Copies of the SWPPP and all documentation required by this permit, including records of all data used to complete the NOI to be covered by this permit, must be retained for at least three years from the date that permit coverage expires or is terminated. This period may be extended by request of EPA at any time.

### PART 7: REOPENER CLAUSE

#### 7.1 Procedures for Modification or Revocation

Permit modification or revocation will be conducted according to 40 CFR §122.62, §122.63, §122.64 and §124.5.

#### 7.2 Water Quality Protection

If there is evidence indicating that the storm water discharges authorized by this permit cause, have the reasonable potential to cause or contribute to an excursion above any applicable water quality standard, you may be required to obtain an individual permit in accordance with Part 4.5 of this permit, or the permit may be modified to include different limitations and/or requirements.

#### 7.3 Timing of Permit Modification

EPA may elect to modify the permit prior to its expiration (rather than waiting for the new permit cycle) to comply with any new statutory or regulatory requirements, such as for effluent limitation guidelines, that may be promulgated in the course of the current permit cycle.

### PART 8: STANDARD PERMIT CONDITIONS

The federal regulations require that the Standard Conditions provisioned at 40 CFR §122.41 be applied to all NPDES permits. You are required to comply with those Standard Conditions, details of which are provided in Appendix G.

### PART 9: PERMIT CONDITIONS APPLICABLE TO SPECIFIC STATES, INDIAN COUNTRY, OR TERRITORIES

The provisions of this Part provide modifications or additions to the applicable conditions of this permit to reflect specific additional conditions required as part of the state or tribal CWA Section 401 certification process, or the Coastal Zone Management Act (CZMA) certification process, or as otherwise established by the permitting authority. The specific additional revisions and requirements only apply to activities in those specific states, Indian country, and federal facilities. States, Indian country, and federal facilities not included in this Part do not have any modifications or additions to the applicable conditions of this permit.

State Coastal Zone Management Act (CZMA) certification was not received from Massachusetts in time for that state to be included in this permit. As such, large construction activities in Massachusetts covered under the 1998 CGP will continue to be covered under that permit. EPA will reissue the CGP for Massachusetts for large and small construction activities at a later date, and will include any state-specific modifications or additions as part of the State's CZMA certification process.

A. Region 1

1. MAR100000: Commonwealth of Massachusetts, except Indian country

a. State Water Quality Statutes, Regulations, and Policies:

- i. You must comply with the Massachusetts Clean Waters Act (Ch. 21, ss. 23-56).
- ii. You must comply with the conditions in 314 CMR 4.00 - Surface Water Quality Standards.
- iii. You must comply with the conditions in 314 CMR 3.00 - Surface Water Discharge Permit Program.
- iv. You must comply with the Wetlands Protection Act, Ch. 131, s. 40 and its regulations, 310 CMR 10.00 and any order of Conditions issued by a Conservation Commission or a Superseding Order of Conditions issued by the Massachusetts Department of Environmental Protection.

b. Department of Environmental Protection Storm Water Management Policy:

- i. You must comply with the Massachusetts Storm Water Management Policy, March 1997 and applicable Storm Water Performance Standards, as prescribed by state regulations promulgated under the authority of the Massachusetts Clean Waters Act, MGL Ch. 21, ss. 23-56 and the Wetlands Protection Act Ch. 131, s. 40.

c. Other State Environmental Laws, Regulations, Policies:

- i. You must comply with the Massachusetts Endangered Species Act [MESA] (MGL Ch. 313A and regulations at 321 CMR 10.00) and any actions undertaken to comply with this storm water permit, shall not result in non-compliance with the MESA.
- ii. You must not conduct activities under this permit that will interfere with implementation of mosquito control work conducted in accordance with Chapter 252 including, s. 5A thereunder and DEP Guideline Number BRP G01-02, West Nile Virus Application of Pesticides to Wetland Resource Areas and Buffer Zones, and Public Water Systems.

d. Other Department Directives:

- i. The Department may require you to perform water quality monitoring during the permit term if monitoring is necessary for the protection of public health or the environment as designated under the authority at 314 CMR 3.00.
- ii. The Department may require you to provide measurable verification of the effectiveness of BMPs and other control measures in your management program, including water quality monitoring.
- iii. The Department has determined that compliance with this permit does not protect you from enforcement actions deemed necessary by the Department under its associated regulations to address an imminent threat to the public health or a significant adverse environmental impact which results in a violation of the Massachusetts Clean Waters Act, Ch. 21, ss. 26-53.
- iv. The Department reserves the right to modify the 401 Water Quality Certification if any changes, modifications or deletions are made to the general permit. In addition, the Department reserves the right to add and/or alter the terms and conditions of its 401 Water Quality Certification to carry out its responsibilities during the term of this permit with respect to water quality, including any revisions to 314 CMR 4.00, Surface Water Quality Standards.

e. Permit Compliance

- i. Should any violation of the Massachusetts Surface Water Quality Standards (314 CMR 4.00) or the conditions of this certification occur, the Department will direct you to correct the violations(s). The Department has the right to take any action as authorized by the General Laws of the Commonwealth to address the violation of this permit or the MA Clean Waters Act and the regulations promulgated thereunder. Substantial civil and criminal penalties are authorized under MGL Ch. 21, s. 42 for discharging into Massachusetts' waters in violation of an order or permit issued by this Department. This certification does not relieve the you of the duty to comply with other applicable Massachusetts statutes and regulations.

2. NHR100000: State of New Hampshire

- a. If you disturb 100,000 square feet or more of contiguous area, you must also apply for a "Significant Alteration of the Terrain Permit from DES pursuant to RSA 485-A:17 and Env-Ws 415. This requirement

applies to the disturbances of only 50,000 square feet when construction occurs within the protected shoreline (see RSA 483-B and Env-Ws 1400).

- b. You must determine that any excavation dewatering discharges are not contaminated before they will be authorized as an allowable non-storm water discharge under this permit (see Subpart 1.3.B). The water is considered uncontaminated if there is no groundwater contamination within 1,000 feet of the discharge. Information on groundwater contamination can be generated over the Internet via the NHDES web site [www.des.state.nh.us](http://www.des.state.nh.us) (One Stop Data Retrieval, Onestop Master Site Table). The web site also provides E-mail access to an NHDES Site Remediation Contact to answer questions about using the Web site.
- c. You must treat any uncontaminated excavation dewatering discharges as necessary to remove suspended solids and turbidity. The discharges must be sampled at a location prior to mixing with storm water at least once per week during weeks when discharges occur. The samples must be analyzed for total suspended solids (TSS) and must meet monthly average and maximum daily TSS limitations of 50 milligrams per liter (mg/L) and 100 mg/L, respectively. TSS (a.k.a. Residue, Nonfilterable) analysis and sampling must be performed in accordance with Tables IB (parameter, units and method) and II (required containers, preservation techniques and holding times) in 40 CFR 136.3 (see: [http://www.access.gpo.gov/nara/cfr/waisidx\\_02/40cfr136\\_02.html](http://www.access.gpo.gov/nara/cfr/waisidx_02/40cfr136_02.html)). Records of any sampling and analysis must be maintained and kept with the SWPPP for at least three years after final site stabilization.
- d. During site design and preparation of the storm water pollution prevention plan (SWPPP), you must consider opportunities for groundwater recharge using on-site infiltration. The SWPPP must include a description of any on-site infiltration that will be installed as a post construction storm water management measure (see Subpart 3.4.E) or reasons for not employing such measures. For design considerations for infiltration measures see the September 2001 DES publication titled "Managing Storm Water as a Valuable Resource" which is available online at: [www.des.state.nh.us/StormWater/construction.htm](http://www.des.state.nh.us/StormWater/construction.htm). Loss of annual recharge to groundwater should be minimized through the use of infiltration measures wherever feasible.

#### B. Region 2

##### 1. NYR10000I: Indian country within the State of New York

###### St. Regis Mohawk Territory at Akwesasne

- a. NOIs shall also be submitted to the St. Regis Mohawk Tribe, Environment Division, at the same time they are submitted to EPA, at the following address:  
  
St. Regis Mohawk Tribe, Environment Division  
412 State Route 37  
Akwesasne, NY 13655  
Attn: Clean Water Program Manager.
- b. In addition, Storm Water Pollution Prevention Plans (and any updates or amendments thereto) must be submitted to the Environment Division and to the Tribal Historic Preservation Officer at least thirty (30) days in advance of corresponding Notices of Intent. This will allow the Environment Division and the THPO to make an informed determination as to whether any proposed discharges might adversely impact the quality of its surface or groundwater, or disturb sites of historic or cultural significance to the Tribe that may be listed, or eligible to be listed, on the National Register of Historic Places.
- c. Within 10 days of the inspection required under Subpart 3.10.G of this permit, the permittee shall provide a copy of the Inspection Report to the Environment Division.

#### C. Region 6

##### 1. NMR150000: The State of New Mexico, except Indian country

*NOTE: Conditions in the New Mexico Environment Department (NMED) certification of the permit resulted in permit requirements adding further restrictions on eligibility for discharges to Outstanding National Resource Waters (ONRWs), expanding on requirements for pollution prevention plans, and limiting options provided in the permit related to inspection frequency and final stabilization.*

- a. In addition to all other provisions of this permit, operators who intend to obtain authorization under this permit for all new storm water discharges must satisfy the conditions in Subpart 9.C.1.a.i, unless a TMDL has been established for the receiving stream which specifies a waste load allocation (WLA) for

construction storm water discharges or the receiving stream is a Tier 3 water, in which case Subpart 9.C.1.a.ii applies.

- i. The operator must include a Sediment Control Plan (SCP) as a part of the Storm Water Pollution Prevention Plan (SWPPP). The SCP must include site-specific interim and permanent stabilization, managerial, and structural solids, erosion, and sediment control BMPs and/or other controls that are designed to prevent an increase in the sediment yield and flow velocity from pre-construction, undisturbed conditions. This applies to discharges both during construction and after construction operations have been completed. The SCP must identify, and document the rationale for selecting these BMPs and/or other controls. The SCP must also describe design specifications, construction specifications, maintenance schedules (including a long term maintenance plan), criteria for inspections, as well as expected performance and longevity of the BMPs. Using appropriate soil loss prediction models (such as SEDCAD 4.0, RUSLE, SEDIMONT II, MULTISED, etc.), the operator(s) must demonstrate, and include documentation in the SCP, that implementation of the site-specific practices will result in sediment yields that will not be greater than the sediment yield levels from pre-construction, undisturbed conditions. The SCP must be prepared in accordance with good engineering practices and certified by a registered professional engineer. The operator(s) must design, implement, and maintain BMPs in the manner specified in the SCP and the SWPPP.
  - ii. Operators are not eligible to obtain authorization under this permit for all new storm water discharges to outstanding national resource waters (ONRWs) (also referred to as "Tier 3: waters). According to the Antidegradation Policy at Paragraph 3 of Subsection A of 20.6.4.8 NMAC, in part, "ONRWs may include, but are not limited to, surface waters of the state within national and state monuments, parks, wildlife refuges, waters of exceptional recreational or ecological significance, and waters identified under the Wild and Scenic Rivers Act." No ONRWs exist at the time this permit is being finalized; however, during the term of the permit, if a receiving water is designated as an ONRW, the operator must obtain an individual permit for storm water discharges from large and small construction activities.
- b. Storm water discharges associated with industrial activity to Clean Water Act section 303(d) waters as well as all other "waters of the State" that the New Mexico Environment Department, Surface Waters Quality Bureau (SWQB) has determined to be or may reasonably be expected to be contributing to a violation of a water quality standard and/or that do not comply with the applicable anti-degradation provisions of the State's WQS are not authorized by this permit.

*Note: Upon receipt of this determination, NMED anticipates that, within a reasonable period of time, EPA will notify the general permittee to apply for and obtain an individual NPDES permit for these discharges per 40 CFR Part 122.28(b)(3).*

- c. Inspections required under Subpart 3.10 must be conducted at least once every 14 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater. The option for inspections at least once per 7 calendar days is not available. The Inspection Waivers provided in Parts 3.10.B and C still apply.
- d. Permittees can not use temporary erosion controls as described in item 3 of the Appendix A definition of "Final Stabilization" as a method for final stabilization under the permit.
- e. Signed copies of discharge monitoring reports, individual permit applications, and all other reports required by the permit to be submitted, shall also be sent to:

Program Manager  
Point Source Regulation Section  
Surface Water Quality Bureau  
New Mexico Environment Department  
P.O. Box 26110  
Santa Fe, NM 87502

2. NMR15000I: Indian country within the State of New Mexico, except Navajo Reservation Lands that are covered under Arizona permit AZR10000I and Ute Mountain Reservation Lands that are covered under Colorado permit COR10000I
  - a. *Pueblo of Acoma* The following conditions apply only to discharges on the Pueblo of Acoma.

- i. A copy of the storm water pollution prevention plan, Notice of Intent, and Notice of Termination must be submitted to the Haaku Water Office at the address below. The pollution prevention plan must be submitted to the Pueblo at least thirty (30) days in advance of submitting the Notice of Intent to EPA.

HAAKU WATER OFFICE  
Pueblo of Acoma  
P.O. Box 309  
Pueblo of Acoma, NM 87034

- b. *Pueblo of Isleta* The following conditions apply only to discharges on the Pueblo of Isleta.

- i. Subpart 1.3.C.4, (Eligibility, Limitations on Coverage) first sentence, is revised to read: "This permit does not authorize discharges that EPA or the Pueblo of Isleta, prior to authorization under this permit, determines will cause, have the reasonable potential to cause, or contribute to an excursion above any applicable water quality standard or impairment of a designated use of receiving waters."

- ii. Subpart 2.4. (Where to Submit) is amended to add the following section (2.4.C):

C. Copies of all Notices of Intent submitted to EPA must also be sent concurrently to the Pueblo of Isleta at the following address. Discharges are not authorized by this permit unless an accurate and complete Notice of Intent has been submitted to the Pueblo of Islet

Regular U.S. Mail Delivery

OR

Overnight/Express Mail Delivery

Environment Department  
Pueblo of Isleta  
P.O. Box 1270  
Isleta, NM 87022

Environment Department  
Building L  
11000 Broadway, SE  
Albuquerque, NM 87105

- iii. Part 2 (Authorizations for Discharges of Storm Water from Construction Activity), second sentence, is amended to read: " Discharges are not authorized if your NOI is incomplete or inaccurate, if you failed to submit a copy of the NOI to the Pueblo of Isleta, or if you were never eligible for permit coverage.
- iv. Subpart 3.4. (Pollution Prevention Plan Contents: Controls to Reduce Pollutants), section A, last sentence, is amended to read: "For each major activity identified in the project description the SWPPP must clearly describe appropriate control measures, the general sequence during the construction process in which the measures will be implemented, and which operator is responsible for the control measure's implementation and maintenance."
- v. Subpart 3.8 (Copy of Permit Requirements), first sentence, is revised to read "Copies of this permit and of the signed and certified NOI form that was submitted to the Pueblo of Isleta and EPA must be included in the SWPPP."
- vi. Subpart 3.10.(Inspections), section A is revised to read "Inspections must be conducted at least once every 7 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater."
- vii. Subpart 3.10. (Inspections), section G, last paragraph, is amended to add: "Copies of inspection reports that identify incidents of noncompliance shall be sent to Pueblo of Isleta at the address listed in Subpart 2.4.C." (See above)
- viii. Subpart 3.12. (Signature, Plan Review and Making Plans Available), section A, first sentence is amended to read: "A copy of the SWPPP (including a copy of the permit) must be retained at the construction site (or other location easily accessible during normal business hours to the Pueblo of Isleta's Environmental Department, EPA, a state, tribal or local agency approving sediment and erosion plans, grading plans, or storm water management plans; local government officials; the operator of a municipal separate storm sewer receiving discharges from the site; and representatives of the U.S. Fish and Wildlife Service or the National Marine Fisheries Service) from the date of commencement of construction activities to the date of final stabilization."
- ix. Subpart 3.12. (Signature, Plan Review and Making Plans Available), section C. is amended to read: "SWPPPs must be made available upon request by EPA; representatives of the Pueblo of Isleta Environment Department, a state, tribal or local agency approving sediment and erosion plans, grading plans, or storm water management plans; local government officials; the operator of a municipal separate storm sewer receiving discharges from the site; and representatives of the U.S. Fish and Wildlife Service or the National Marine Fisheries Service to the requestor. The copy of the



SWPPP that is required to be kept on-site or locally available must be made available, in its entirety, to the EPA staff and the Pueblo of Isleta's Environment Department staff for review and copying at the time of an on-site inspection.

- x. Subpart 3.13. (Management Practices), section A is amended to add: "Erosion and sediment controls shall be designed to retain sediment on-site."
- xi. Subpart 4.3 (Releases in Excess of Reportable Quantities), first bullet is amended to read: "you must provide notice to the Pueblo of Isleta Environment Department (505-869-5748) and the National Response Center (NRC) (800 424 8802; in the Washington, DC, metropolitan area call 202 426 2675) in accordance with the requirements of 40 CFR Part 110, 40 CFR Part 117 and 40 CFR Part 302 as soon as site staff have knowledge of the discharge; and"
- xii. Subpart 4.5 (Attainment of Water Quality Standards After Authorization), is amended to add the following fourth bullet:  

"You must provide the Pueblo of Isleta, at the address listed in Subpart 2.4.C, with a copy of the EPA notification, the supplemental action plan, data and certification required by EPA."
- xiii. Subpart 5.3. (Where to Submit) is amended to add the following section (5.3.C):  

C. Copies of all Notices of Termination submitted to EPA must also be sent concurrently to the Pueblo of Isleta at the following address.

Regular U.S. Mail Delivery

OR

Overnight/Express Mail Delivery

Environment Department  
 Pueblo of Isleta  
 P.O. Box 1270  
 Isleta, NM 87022

Environment Department  
 Building L  
 11000 Broadway, SE  
 Albuquerque, NM 87105

- xiv. Any correspondence, other than NOIs and NOTs, with the Pueblo of Isleta concerning storm water discharges authorized by this permit shall sent one of the addresses in Subpart 5.3.C (see above).
- xv. Appendix G, Section 9, first sentence is amended to read:  

"You must allow the Pueblo of Isleta's Environment Department, EPA, or an authorized representative (including an authorized contractor acting as a representative of the Administrator), upon presentation of credentials and other documents as may be required by law, to:"
- xvi. Appendix G, Section 12, subsections A, B, C, F, G and H are amended to require that when you must notify EPA of an event (e.g., planned changes, anticipated noncompliance, transfers, required reporting due to potential adverse effects or environmental impacts or other noncompliance matters), the Pueblo of Isleta must also be notified.
- xvii. Parties wishing to apply for an Equivalent Analysis Waiver (see Appendix D, Section C) must provide a copy of the waiver analysis to the Pueblo of Isleta at the address specified in Subpart 5.3.C (See above) at the time it is submitted to EPA.
- c. *Pueblo of San Juan.* The following conditions apply only to discharges on the Pueblo of San Juan.
  - i. Copies of the Notice of Intent (NOI) and Notice of Termination (NOT) must be provided to the Pueblo at the time it is provided to the Environmental Protection Agency, at the following address:  

Office of Environmental Affairs  
 Pueblo of San Juan  
 P.O. Box 717  
 San Juan, NM 87566
  - ii. Appendix G, Section 10 (Monitoring and records), item D is amended to add:  

"All monitoring must be conducted in accordance with the Pueblo of San Juan's Quality Assurance Project Plan."
- d. *Pueblo of Sandia.* The following conditions apply only to discharges on the Pueblo of Sandia.

- i. Copies of the Notice of Intent (NOI) and Notice of Termination (NOT) must be provided to the Pueblo at the same time it is submitted to the Environmental Protection Agency.

Environment Department  
Pueblo of Sandia  
Box 6008  
Bernalillo, NM 87004

- ii. The Storm Water Pollution Prevention Plan must be available to tribal environmental personnel upon request.
  - iii. You must telephone the Pueblo of Sandia Environment Department at (505) 867-4533 of any noncompliance that may endanger human health or the environment within ten (10) hours of becoming aware of the circumstance.
- e. *Santa Clara Pueblo*. The following conditions apply only to discharges on the Santa Clara Pueblo.

- i. Copies of the Notice of Intent (NOI) and Notice of Termination (NOT) must be provided to the Santa Clara Pueblo Office of Environmental Affairs at the same time it is submitted to the Environmental Protection Agency.

Santa Clara Pueblo  
Office of Environmental Affairs  
One Knee Street  
P.O. Box 580  
Española, NM 87532

- f. *Pueblo of Tesuque* The following conditions apply only to discharges on the Pueblo of Tesuque.

- i. A copy of the storm water pollution prevention plan, Notice of Intent, and Notice of Termination must be submitted to the Pueblo of Tesuque Environment Department at the address below. The Notice of Intent and the Notice of Termination must be submitted at the same time they are submitted to EPA. The pollution prevention plan must be submitted before the project begins. Phone: 505- 983-2667 FAX: 505-982-2331

Pueblo of Tesuque  
Environment Department  
Rt. 42, Box 360-T  
Santa Fe, NM 87506

3. OKR15000F: Discharges in the State of Oklahoma that are not under the authority of the Oklahoma Department of Environmental Quality, including activities associated with oil and gas exploration, drilling, operations, and pipelines (includes SIC Groups 13 and 46, and SIC codes 492 and 5171), and point source discharges associated with agricultural production, services, and silviculture (includes SIC Groups 01, 02, 07, 08, 09).

- a. Subpart 1.3.C. (Limitations on Coverage) is modified to add paragraphs 8 and 9 as follows:

"8. For activities located within the watershed of any Oklahoma Scenic River, including the Illinois River, Flint Creek, Barren Fork Creek, Upper Mountain Fork, Little Lee Creek, and Big Lee Creek or an water or watershed designated "ORW" (Outstanding Resource Water) in Oklahoma's Water Quality Standards, this permit may only be used to authorize discharges from temporary construction activities. Discharges from ongoing activities such as sand and gravel mining or any other mineral mining are not authorized.

9. Activities located within the watershed of any Oklahoma Scenic River, including the Illinois River, Flint Creek, Barren Fork Creek, Upper Mountain Fork, Little Lee Creek, and Big Lee Creek or an water or watershed designated "ORW" (Outstanding Resource Water) in Oklahoma's Water Quality Standards, this permit may not be used to authorize discharges from concrete or asphalt batch plants."

D. Region 8

1. MTR10000I: Indian country within the State of Montana

- a. Confederated Salish and Kootenai Tribes of the Flathead Nation. The following conditions apply only for projects on the Flathead Indian Reservation:

- i. The permittee must send the SWPPP to the Tribes at least 30 days before construction starts. The 30 day period will give Tribal staff time to become familiar with the project site, prepare for construction inspections and determine compliance with Tribal water quality standards, as required by the Tribe's Water Quality Management Ordinance 89B (1990) and Surface Water Quality Standards & Antidegradation Policy (1995). Copies of the SWPPP should be sent to the following address:

Confederated Salish and Kootenai Tribes  
Natural Resources Department  
Department Head  
P.O. Box 278  
Pablo, MT 59855

- ii. Before submitting the Notice of Termination, permittees must clearly demonstrate to an appointed tribal staff person during an on-site inspection that requirements for site stabilization have been met and all temporary erosion control structures removed. The staff person performing the on-site inspection will be determined by the Environmental Protection Division Manager. The staff person will draft a short letter stating the stabilization requirements have been met to add to the permittees Notice of Termination submission to EPA.
- iii. The permittee must send a copy of the Notice of Intent (NOI) and the Notice of Termination (NOT) to the Tribes at the same time that the NOI and NOT is sent to EPA. Copies of the NOI and NOT should be sent to the address above.

- b. Fort Peck Tribes - Assiniboine & Sioux. The following conditions apply only for projects within the Fort Peck Indian Reservation:

- i. The permittee must send a copy of the Notice of Intent (NOI) and the Notice of Termination (NOT) to the Tribes at the same time that the NOI and NOT is sent to EPA. Copies of the NOI and NOT should be sent to the following address:

Deb Madison  
Environmental Program Manager  
Fort Peck Assiniboine & Sioux Tribes  
P.O. Box 1027  
Poplar, MT 59255

E. Region 9

1. ASR100000: The Island of American Samoa

- a. Discharges authorized by the general permit shall meet all applicable American Samoa water quality standards.
- b. Permittees discharging under the general permit shall comply with all conditions of the permit.

2. AZR100001: Indian country lands within the State of Arizona, including Navajo Reservation lands in New Mexico and Utah

- a. White Mountain Apache Tribe. The following condition applies only for projects on the White Mountain Apache Reservation: All NOIs for proposed storm water discharge coverage shall be provided to the following address:

Tribal Environmental Planning Office  
P.O. Box 2109  
Whiteriver, AZ 85941

3. NIR100000: Commonwealth of the Northern Mariana Islands (CNMI)

- a. An Earthmoving and Erosion Control Permit shall be obtained from the CNMI DEQ prior to any construction activity covered under the NPDES general permit.
- b. All conditions and requirements set forth in the USEPA NPDES general permit for discharges from large and small construction must be complied with.

- c. A SWPPP for storm water discharges from construction activity must be approved by the Director of the CNMI DEQ prior to the submission of the NOI to USEPA. The CNMI address for the submittal of the SWPPP for approval is:  
  
Commonwealth of the Northern Mariana Islands  
Office of the Governor  
Director, Division of Environmental Quality (DEQ)  
P.O. Box 501304 C.K.  
Saipan, MP 96950-1304
- d. An NOI to be covered by the general permit for discharges from large and small construction sites must be submitted to CNMI DEQ (use above address) and USEPA, Region 9, in the form prescribed by USEPA, accompanied by a SWPPP approval letter from CNMI DEQ.
- e. The NOI must be postmarked seven (7) calendar days prior to any storm water discharges and a copy must be submitted to the Director of CNMI DEQ (use above address) no later than seven (7) calendar days prior to any stormwater discharges.
- f. Copies of all monitoring reports required by the NPDES general permit must be submitted to CNMI DEQ (use above address).
- g. In accordance with section 10.3(h) and (i) of the CNMI water quality standards, CNMI DEQ reserves the right to deny coverage under the general permit and to require submittal of an application for an individual NPDES permit based on a review of the NOI or other information made available to the Director.

F. Region 10

1. AKR100000: The State of Alaska, except Indian country

- a. Operators of construction projects disturbing five or more acres occurring outside the Municipality of Anchorage must submit a copy of the Storm Water Pollution Prevention Plan (SWPPP) and a copy of the Notice of Intent (NOI) to the State of Alaska Department of Environmental Conservation (ADEC) for review, and shall be accompanied by the state-required fee of \$400. Submittal of the SWPPP and the NOI to the ADEC should be made at the same time the NOI is submitted to the EPA.
- b. Operators of publicly-funded projects disturbing five or more acres occurring within the Municipality of Anchorage must submit a copy of the SWPPP and a copy of the NOI to the ADEC for review, and shall be accompanied by the state-required fee of \$400. Submittal of the SWPPP and the NOI to the ADEC should be made at the same time the NOI is submitted to the EPA.
- c. Operators of construction projects disturbing at least one acre and less than five acres must submit a copy of the NOI to the ADEC at the same time it is submitted to the EPA.
- d. Storm Water Pollution Prevention Plans and Notices of Intent must be submitted to ADEC at the following address:  
  
Alaska Department of Environmental Conservation  
Water Quality Permitting/Storm Water  
555 Cordova Street  
Anchorage, Alaska 99501
- e. Operators of private construction projects disturbing one or more acres within the Municipality of Anchorage shall submit a copy of the Storm Water Pollution Prevention Plan to the Municipality at the following address:  
  
Municipality of Anchorage, Office of Planning Development and Public Works  
4700 S. Bragaw Street  
P.O. Box 196650  
Anchorage, Alaska 99519-6650
- f. Submittal of the SWPPP to the Municipality of Anchorage should be made before or at the same time the NOI is submitted to the EPA and the ADEC and shall be accompanied by any Municipality-required fee.

2. IDR100000: The State of Idaho, except Indian country
- a. Any construction related storm water discharges to impaired water bodies on Idaho's Clean Water Act (CWA) Section 303(d) list with EPA-approved Total Maximum Daily Loads (TMDL) must be consistent with any load allocations established by the applicable TMDL.
  - b. No net increase of listed pollutants is allowed in any construction related storm water discharges to an impaired water body considered "high priority" as included on Idaho's CWA Section 303(d) list that does not yet have an EPA-approved TMDL.
  - c. If a TMDL has not been established for an impaired water body considered "medium priority" or "low priority" as included on Idaho's CWA Section 303(d) list, BMPs shall be employed as necessary to prohibit further impairment of the designated or existing beneficial uses.
  - d. Only BMPs authorized by the appropriate designated agency as defined in the Idaho Water Quality Standards and Wastewater Treatment Requirements (IDAPA 58.01.02 et seq.), or otherwise approved by the Idaho Department of Environmental Quality, will be allowed.
  - e. Use of the "Equivalent Analysis Waiver" in Addendum D is not authorized.
  - f. Operators may contact the Idaho Department of Environmental Quality regional office nearest the construction activity for more information about impaired waterways:

Boise Regional Office:

1445 N. Orchard  
Boise ID 83706-2239  
Tel: (208)373-0550  
Fax: (208)373-0287

Cascade Satellite Office:

109 N. Main St., PO Box 247  
Cascade, ID 83611  
Tel: (208)382-6808  
Fax: (208)382-3327

Coeur d'Alene Regional Office:

2110 Ironwood Parkway  
Coeur d'Alene ID 83814  
Tel: (208)769-1422  
Fax: (208)769-1404

Grangeville Satellite Office:

300 W. Main  
Grangeville ID 83530  
Tel: (208)983-0808  
Fax: (208)983-2873

Idaho Falls Regional Office:

900 N. Skyline, Suite B  
Idaho Falls, ID 83402  
Tel: (208)528-2650  
Fax: (208)528-2695

Lewiston Regional Office:

1118 "F" Street  
Lewiston, ID 83501  
Tel: (208)799-4370  
Toll Free: 1-877-541-3304  
Fax: (208)799-3451

Pocatello Regional Office:

444 Hospital Way #300  
Pocatello ID 83201  
Tel: (208)236-6160  
Fax: (208)236-6168

Twin Falls Regional Office:

601 Pole Line Road, Suite 2  
Twin Falls, ID 83301  
Tel: (208)736-2190  
Fax: (208)736-2194

3. ORR100001: Indian country within the State of Oregon, except Fort McDermitt Reservation lands (see Region 9):
- a. Confederated Tribes of the Umatilla Indian Reservation. The following conditions apply only for projects within the exterior boundaries of the Umatilla Indian Reservation:
    - i. The operator shall be responsible for achieving compliance with the Confederated Tribes of the Umatilla Indian Reservation's (CTUIR) Water Quality Standards.
    - ii. The operator shall submit all Erosion Control and/or Storm Water Pollution Prevention Plans to the CTUIR Water Resources Program for review and approval by the Department of Natural Resources Director prior to submitting the Notice of Intent to EPA and prior to beginning any discharge activities.
    - iii. The operator shall contact the CTUIR Tribal Historic Preservation Office (THPO) prior to beginning any construction activities to determine whether a cultural resource survey of the project area or other investigation is required. All cultural resource fieldwork must be conducted by qualified personnel and documented using Oregon Reporting Standards. The resulting report must be submitted to the THPO for concurrence at least 30 days before any ground disturbing work can occur at the site. The operator must obtain THPO concurrence in the form of a letter, which (if necessary) will include any measures that must be taken to prevent or mitigate adverse effects to potentially eligible historic properties, prior to any ground disturbing work.
    - iv. The operator shall submit copies of the Notice of Intent to the CTUIR Water Resources Program and the CTUIR Tribal Historic Preservation Office at the same time it is submitted to EPA.

- v. Erosion Control and Storm Water Pollution Prevention Plans and Notices of Intent shall be submitted to:

Confederated Tribes of the Umatilla Indian Reservation  
Water Resources Program  
P.O. Box 638  
Pendleton, OR 97801  
(541) 276-3447

Confederated Tribes of the Umatilla Indian Reservation  
Cultural Resources Protection Program  
Tribal Historic Preservation Office  
P.O. Box 638  
Pendleton, OR 97801  
(541) 276-3629

- b. Confederated Tribes of Warm Springs. The following conditions apply only for projects on the Warm Springs Indian Reservation:

- i. All activities covered by this NPDES general permit occurring within a designated riparian buffer zone as established in Ordinance 74 (Integrated Resource Management Plan or IRMP) must be reviewed, approved and permitted through the Tribe's Hydraulic Permit Application process, including payment of any applicable fees.
- ii. All activities covered by this NPDES general permit must follow all applicable land management and resource conservation requirements specified in the IRMP.
- iii. Operators of activities covered by this NPDES general permit must submit a Storm Water Pollution Prevention Plan to the Tribe's Water Control Board at the following address for approval at least 30 days prior to beginning construction activity:

Chair, Warm Springs Water Control Board  
P.O. Box C  
Warm Springs, Oregon 97761

4. WAR10000F: Federal Facilities in the State of Washington, except those located on Indian Country

The following conditions apply to stormwater discharges from all permitted construction sites which disturb one acre or more and which discharge to surface waters (40 CFR part 122.26(b)(14)(x) and 122.26 (b)(15)):

- a. Discharges must not cause or contribute to a violation of surface water quality standards (Chapter 173-201A WAC), sediment management standards (Chapter 173-204 WAC), ground water quality standards (Chapter 173-200 WAC), and human health-based criteria in the National Toxics Rule (Federal Register, Vol. 57, No. 246, Dec. 22, 1992, pages 60848-60923). Discharges that are not in compliance with these standards are not authorized.
- b. You must apply all known available and reasonable methods of prevention, control and treatment (AKART), including the preparation and implementation of an adequate Stormwater Pollution Prevention Plan (SWPPP), with all appropriate BMPs installed and maintained in accordance with the SWPPP and the terms and conditions of this permit.
- c. Stormwater BMPs must be properly designed, constructed, maintained and operated to:
- i. Prevent pollution of state waters and protect water quality, including compliance with applicable state water quality standards;
- ii. Satisfy state requirements for all known available and reasonable methods of prevention, control and treatment (AKART) of wastes (including construction stormwater runoff) prior to discharge to waters of the state; and
- iii. Satisfy the federal technology-based treatment requirements under 40 CFR part 125.3.
- d. You must document the technical basis for the design criteria used to select and design your stormwater management BMPs. You must document within your Stormwater Pollution Prevention Plan (SWPPP) how stormwater BMPs were selected, the pollutant removal performance expected from the BMP being selected, the technical basis (scientific, technical studies, and/or modeling) which support the performance claims for the BMPs being selected, and an assessment of how the selected BMP will

comply with state water quality standards, satisfy the state AKART requirements, and satisfy the federal technology-based treatment requirements.

If you choose to follow the stormwater management practices contained in stormwater technical manuals approved by Washington State, including the proper selection, implementation and maintenance of appropriate BMPs, you are presumed to have satisfied this demonstration requirement and do not need to include within the SWPPP the technical basis which support the performance claims for the BMPs being used. The SWPPP must include a reference to the manual used. Approved stormwater technical manuals include:

- i. Stormwater Management Manual for Western Washington, August 2001, for sites west of the crest of the Cascade Mountains;
  - ii. Stormwater Management Manual for Eastern Washington, (completion expected in the fall of 2003) for sites east of the crest of the Cascade Mountains; or
  - iii. Other equivalent stormwater management guidance documents approved by Ecology.
- e. Stormwater discharges from construction sites which disturb 5 acres or more (40 CFR part 122.26(b)(14)(x)) and which discharge to surface waters listed as impaired by the state under Section 303(d) of the Clean Water Act for turbidity, fine sediment, high pH, and/or phosphorus are subject to an effluent limitation that is equal to the applicable water quality standards at the point of discharge. If impairment is due to turbidity and/or fine sediment, the turbidity at the point of discharge shall not exceed the background (upstream) turbidity of the receiving water.
- i. Effluent limitations apply to direct discharges to listed waterbodies as well as indirect discharges via a stormwater conveyance system.
  - ii. All references and requirements associated with Section 303(d) of the Clean Water Act shall use the most current listing by Ecology of impaired waters that exists at the time of application for coverage under this permit
- f. Stormwater discharges from construction sites which disturb 5 acres or more (40 CFR part 122.26(b)(14)(x)) and which discharge to surface waters for which there is a total maximum daily load (TMDL) allocation or other control plan that addresses sediment (including turbidity, fine sediment, total suspended solids or siltation), high pH, or phosphorus must be consistent with the requirements in the approved TMDL or applicable control plan. Control plans may be total maximum daily load (TMDL) determinations, restrictions for the protection of endangered species, ground water management plans, or other limitations that regulate or set limits on discharges to a specific waterbody or groundwater recharge area.

Information on impaired waterways is available from the Department of Ecology web site at: <http://www.ecy.wa.gov/programs/wq/stormwater>. You may also contact the Department of Ecology for more information about impaired waterways at:

Mailing Address:

Department of Ecology  
Stormwater Unit  
PO Box 47600  
Olympia, WA 98504-7600  
Phone: 360-407-6000

Physical Address:

Department of Ecology  
300 Desmond Drive  
Lacey, WA 98503  
Phone: 360-407-6000

5. WAR10000I: Indian country within the State of Washington
- a. Puyallup Tribe of Indians. The following conditions apply only for projects on the Puyallup Reservation:
    - i. Each operator shall be responsible for achieving compliance with the Puyallup Tribe's Water Quality Standards.

- ii. Each operator shall submit all Pollution Prevention Plans to the Puyallup Tribe Environmental Department for review and approval prior to beginning any discharge activities.
  - iii. Each operator shall submit a copy of the Notice of Intent to the Puyallup Tribal Environmental Department at the same time it is submitted to EPA.
  - iv. Storm Water Pollution Prevention Plans and Notices of Intent shall be submitted to:  
Puyallup Tribe Natural Resources, Environmental Department  
1850 Alexander Avenue  
Tacoma, WA 98421
- b. Confederated Tribes of the Chehalis Reservation. The following conditions apply only for projects on the Chehalis Reservation:
- i. The operator shall be responsible for achieving compliance with the Chehalis Tribe's Water Quality Standards.
  - ii. The operator shall submit a Storm Water Pollution Prevention Plan to the Chehalis Tribe Department of Natural Resources for review and approval at least thirty (30) days prior to beginning any discharge activities.
  - iii. The operator shall submit a copy of the Notice of Intent to the Chehalis Tribe Department of Natural Resources at the same time it is submitted to EPA.
  - iv. Storm Water Pollution Prevention Plans and Notices of Intent shall be submitted to:  
Chehalis Tribe Department of Natural Resources  
420 Howanut Road  
Oakville, WA 98568



## Appendix A - Definitions and Acronyms

### Definitions

"Arid Areas" means areas with an average annual rainfall of 0 to 10 inches.

"Best Management Practices" (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants to waters of the United States. BMPs also include treatment requirements, operating procedures, and practice to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

"Commencement of Construction Activities" means the initial disturbance of soils associated with clearing, grading, or excavating activities or other construction-related activities (e.g., stockpiling of fill material).

"Control Measure" as used in this permit, refers to any BMP or other method used to prevent or reduce the discharge of pollutants to waters of the United States.

"CWA" means the Clean Water Act or the Federal Water Pollution Control Act, 33 U.S.C. section 1251 et seq.

"Discharge" when used without qualification means the "discharge of a pollutant."

"Discharge of Storm Water Associated with Construction Activity" as used in this permit, refers to a discharge of pollutants in storm water from areas where soil disturbing activities (e.g., clearing, grading, or excavation), construction materials or equipment storage or maintenance (e.g., fill piles, borrow area, concrete truck washout, fueling), or other industrial storm water directly related to the construction process (e.g., concrete or asphalt batch plants) are located.

"Eligible" means qualified for authorization to discharge storm water under this general permit.

"Facility" or "Activity" means any "point source" or any other facility or activity (including land or appurtenances thereto) that is subject to regulation under the NPDES program.

"Federal Facility" means any buildings, installations, structures, land, public works, equipment, aircraft, vessels, and other vehicles and property, owned by, or constructed or manufactured for the purpose of leasing to, the Federal government.

"Final Stabilization" means that:

1. All soil disturbing activities at the site have been completed and either of the two following criteria are met:
  - a. a uniform (e.g., evenly distributed, without large bare areas) perennial vegetative cover with a density of 70 percent of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or
  - b. equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.
2. When background native vegetation will cover less than 100 percent of the ground (e.g., arid areas, beaches), the 70 percent coverage criteria is adjusted as follows: if the native vegetation covers 50 percent of the ground, 70 percent of 50 percent ( $0.70 \times 0.50 = 0.35$ ) would require 35 percent total cover for final stabilization. On a beach with no natural vegetation, no stabilization is required.
3. In arid and semi-arid areas only, all soil disturbing activities at the site have been completed and both of the following criteria have been met:
  - a. Temporary erosion control measures (e.g., degradable rolled erosion control product) are selected, designed, and installed along with an appropriate seed base to provide erosion control for at least three years without active maintenance by you,
  - b. The temporary erosion control measures are selected, designed, and installed to achieve 70 percent vegetative coverage within three years.
4. For individual lots in residential construction, final stabilization means that either:
  - a. The homebuilder has completed final stabilization as specified above, or

- b. The homebuilder has established temporary stabilization including perimeter controls for an individual lot prior to occupation of the home by the homeowner and informing the homeowner of the need for, and benefits of, final stabilization.
5. For construction projects on land used for agricultural purposes (e.g., pipelines across crop or range land, staging areas for highway construction, etc.), final stabilization may be accomplished by returning the disturbed land to its preconstruction agricultural use. Areas disturbed that were not previously used for agricultural activities, such as buffer strips immediately adjacent to "water of the United States," and areas which are not being returned to their preconstruction agricultural use must meet the final stabilization criteria (1) or (2) or (3) above.

"Indian country" is defined at 40 CFR §122.2 to mean:

1. All land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation;
2. All dependent Indian communities with the borders of the United States whether within the originally or subsequently acquired territory thereof, and whether within or without the limits of a state; and
3. All Indian allotments, the Indian titles to which have not been extinguished, including rights-of-ways running through the same.

"Large Construction Activity" is defined at 40 CFR §122.26(b)(14)(x) and incorporated here by reference. A large construction activity includes clearing, grading, and excavating resulting in a land disturbance that will disturb equal to or greater than five acres of land or will disturb less than five acres of total land area but is part of a larger common plan of development or sale that will ultimately disturb equal to or greater than five acres. Large construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site.

"Municipal Separate Storm Sewer System" or "MS4" is defined at 40 CFR §122.26(b)(8) to mean a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains):

1. Owned and operated by a state, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States;
2. Designed or used for collecting or conveying storm water;
3. Which is not a combined sewer; and
4. Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR §122.2.

"New Project" means the "commencement of construction activities" occurs after the effective date of this permit.

"Ongoing Project" means the "commencement of construction activities" occurs before the effective date of this permit.

"Operator" for the purpose of this permit and in the context of storm water associated with construction activity, means any party associated with a construction project that meets either of the following two criteria:

1. The party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or
2. The party has day-to-day operational control of those activities at a project which are necessary to ensure compliance with a SWPPP for the site or other permit conditions (e.g., they are authorized to direct workers at a site to carry out activities required by the SWPPP or comply with other permit conditions). This definition is provided to inform permittees of EPA's interpretation of how the regulatory definitions of "owner or operator" and "facility or activity" are applied to discharges of storm water associated with construction activity.

"Owner or operator" means the owner or operator of any "facility or activity" subject to regulation under the NPDES program.

“Permitting Authority” means the United States Environmental Protection Agency, EPA, a Regional Administrator of the Environmental Protection Agency or an authorized representative.

“Point Source” means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

“Pollutant” is defined at 40 CFR §122.2. A partial listing from this definition includes: dredged spoil, solid waste, sewage, garbage, sewage sludge, chemical wastes, biological materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial or municipal waste.

“Project Area” means:

- The areas on the construction site where storm water discharges originate and flow toward the point of discharge into the receiving waters (including areas where excavation, site development, or other ground disturbance activities occur) and the immediate vicinity. (Example: 1. Where bald eagles nest in a tree that is on or bordering a construction site and could be disturbed by the construction activity or where grading causes storm water to flow into a small wetland or other habitat that is on the site that contains listed species.)
- The areas where storm water discharges flow from the construction site to the point of discharge into receiving waters. (Example: Where storm water flows into a ditch, swale, or gully that leads to receiving waters and where listed species (such as amphibians) are found in the ditch, swale, or gully.)
- The areas where storm water from construction activities discharge into receiving waters and the areas in the immediate vicinity of the point of discharge. (Example: Where storm water from construction activities discharges into a stream segment that is known to harbor listed aquatic species.)
- The areas where storm water BMPs will be constructed and operated, including any areas where storm water flows to and from BMPs. (Example: Where a storm water retention pond would be built.)
- The areas upstream and /or downstream from construction activities discharges into a stream segment that may be affected by the said discharges. (Example: Where sediment discharged to a receiving stream settles downstream and impacts a breeding area of a listed aquatic species.)

“Receiving water” means the “Water of the United States” as defined in 40 CFR §122.2 into which the regulated storm water discharges.

“Runoff coefficient” means the fraction of total rainfall that will appear at the conveyance as runoff.

“Semi-Arid Areas” means areas with an average annual rainfall of 10 to 20 inches.

“Site” means the land or water area where any “facility or activity” is physically located or conducted, including adjacent land used in connection with the facility or activity.

“Small Construction Activity” is defined at 40 CFR §122.26(b)(15) and incorporated here by reference. A small construction activity includes clearing, grading, and excavating resulting in a land disturbance that will disturb equal to or greater than one (1) acre and less than five (5) acres of land or will disturb less than one (1) acre of total land area but is part of a larger common plan of development or sale that will ultimately disturb equal to or greater than one (1) acre and less than five (5) acres. Small construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site.

“Storm Water” means storm water runoff, snow melt runoff, and surface runoff and drainage.

“Storm Water Discharge-Related Activities” as used in this permit, include: activities that cause, contribute to, or result in storm water point source pollutant discharges, including but not limited to: excavation, site development, grading and other surface disturbance activities; and measures to control storm water including the siting, construction and operation of BMPs to control, reduce or prevent storm water pollution.

“Total Maximum Daily Load” or “TMDL” means the sum of the individual wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources and natural background. If a receiving water has only one point source discharger, the TMDL is the sum of that point source WLA plus the LAs for any nonpoint sources of pollution and natural background sources, tributaries, or adjacent segments. TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measure.

"Waters of the United States" is as defined at 40 CFR §122.2.

"Wetland" means those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

**ACRONYMS**

BMP - Best Management Practices

CGP - Construction General Permit

CFR - Code of Federal Regulations

CWA - Clean Water Act

EPA - United States Environmental Protection Agency

ESA - Endangered Species Act

FWS - United States Fish and Wildlife Service

MS4 - Municipal Separate Storm Sewer System

MSGP - Multi-Sector General Permit

NHPA - National Historic Preservation Act

NMFS - United States National Marine Fisheries Service

NOI - Notice of Intent

NOT - Notice of Termination

NPDES - National Pollutant Discharge Elimination System

POTW - Publicly Owned Treatment Works

SHPO - State Historic Preservation Officer

SWPPP - Storm Water Pollution Prevention Plan

THPO - Tribal Historic Preservation Officer

TMDL - Total Maximum Daily Load

WQS - Water Quality Standard

**Appendix B - Permit Areas Eligible for Coverage**

Permit coverage for storm water discharges from construction activity occurring within the following areas is provided by legally separate and distinctly numbered permits:

**1. EPA Region 1: CT, MA, ME, NH, RI, VT**

US EPA, Region 01  
Office of Ecosystem Protection  
NPDES Storm Water Program  
1 Congress St, Suite 1100 (CMU)  
Boston, MA 02114-2023

The States of Connecticut, Maine, Rhode Island, and Vermont are the NPDES Permitting Authority for the majority of discharges within their respective states. The 1998 CGP was issued in the State of Massachusetts on February 17, 1998 (63 FR 78116) and the terms and conditions of the 1998 permit are effective for large construction activities in Massachusetts until further noticed. EPA will reissue this permit for the State of Massachusetts and for Indian Country within the State of Massachusetts for both large and small construction activities at a future date.

**Permit No.      Areas of Coverage/Where EPA is Permitting Authority**

<b>CTR10000I</b>	Indian country within the State of Connecticut
<b>NHR100000</b>	State of New Hampshire
<b>RIR10000I</b>	Indian country within the State of Rhode Island
<b>VTR10000F</b>	Federal Facilities in the State of Vermont

**2. EPA Region 2: NJ, NY, PR, VI**

For NJ, NY, and VI:

US EPA, Region 02  
NPDES Storm Water Program  
290 Broadway, 24th Floor  
New York, NY 10007-1866

For PR:

US EPA, Region 02  
Caribbean Environmental Protection Division  
NPDES Storm Water Program  
1492 Ponce de Leon Ave  
Central Europa Building, Suite 417  
San Juan, PR 00907-4127

The State of New York is the NPDES Permitting Authority for the majority of discharges within its state. The State of New Jersey and the Virgin Islands are the NPDES Permitting Authority for all discharges within their respective states.

**Permit No.      Areas of Coverage/Where EPA is Permitting Authority**

<b>NYR10000I</b>	Indian country within the State of New York
<b>PRR100000</b>	The Commonwealth of Puerto Rico

**3. EPA Region 3: DE, DC, MD, PA, VA, WV**

US EPA, Region 03  
 NPDES Storm Water Program  
 1650 Arch St  
 Philadelphia, PA 19103

The State of Delaware is the NPDES Permitting Authority for the majority of discharges within its state. Maryland, Pennsylvania, Virginia, and West Virginia are the NPDES Permitting Authority for all discharges within their respective states.

<u>Permit No.</u>	<u>Areas of Coverage/Where EPA is Permitting Authority</u>
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<b>DCR100000</b>	The District of Columbia
<b>DER10000F</b>	Federal Facilities in the State of Delaware

**4. EPA Region 4: AL, FL, GA, KY, MS, NC, SC, TN**

US EPA, Region 04  
 Water Management Division  
 NPDES Storm Water Program  
 61 Forsyth St SW  
 Atlanta, GA 30303-3104

Coverage Not Available. Construction activities in Region 4 must obtain permit coverage under an alternative permit.

**5. EPA Region 5: IL, IN, MI, MN, OH, WI**

US EPA, Region 05  
 NPDES & Technical Support  
 NPDES Storm Water Program  
 77 W Jackson Blvd  
 (WN-16J)  
 Chicago, IL 60604-3507

The States of Michigan, Minnesota, and Wisconsin are the NPDES Permitting Authority for the majority of discharges within their respective states. The States of Illinois, Indiana, and Ohio are the NPDES Permitting Authorities for all discharges within their respective states.

<u>Permit No.</u>	<u>Areas of coverage/where EPA is Permitting Authority</u>
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<b>MIR10000I</b>	Indian country within the State of Michigan
<b>MNR10000I</b>	Indian country within the State of Minnesota
<b>WIR10000I</b>	Indian country within the State of Wisconsin, except the Sokaogon Chippewa (Mole Lake) Community.

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**6. EPA Region 6: AR, LA, OK, TX, NM (except see Region 9 for Navajo lands, and see Region 8 for Ute Mountain Reservation lands)**

US EPA, Region 06  
 NPDES Storm Water Program  
 1445 Ross Ave, Suite 1200  
 Dallas, TX 75202-2733

The States of Louisiana, Oklahoma, and Texas are the NPDES Permitting Authority for the majority of discharges within their respective state. The State of Arkansas is the NPDES Permitting Authority for all discharges within its respective state.

<u>Permit No.</u>	<u>Areas of coverage/where EPA is Permitting Authority</u>
LAR15000I	Indian country within the State of Louisiana
NMR150000	The State of New Mexico, except Indian country
NMR15000I	Indian country within the State of New Mexico, except Navajo Reservation Lands that are covered under Arizona permit AZR10000I and Ute Mountain Reservation Lands that are covered under Colorado permit COR10000I.
OKR15000I	Indian country within the State of Oklahoma
OKR15000F	Discharges in the State of Oklahoma that are not under the authority of the Oklahoma Department of Environmental Quality, including activities associated with with oil and gas exploration, drilling, operations, and pipelines (includes SIC Groups 13 and 46, and SIC codes 492 and 5171), and point source discharges associated with agricultural production, services, and silviculture (includes SIC Groups 01, 02, 07, 08, 09).
TXR15000F	Discharges in the State of Texas that are not under the authority of the Texas Commission on Environmental Quality (formerly TNRCC), including activities associated with the exploration, development, or production of oil or gas or geothermal resources, including transportation of crude oil or natural gas by pipeline.
TXR15000I	Indian country within the State of Texas.

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**7. EPA Region 7: IA, KS, MO, NE (except see Region 8 for Pine Ridge Reservation Lands)**

US EPA, Region 07  
 NPDES Storm Water Program  
 901 N 5th St  
 Kansas City, KS 66101

The States of Iowa, Kansas, and Nebraska are the NPDES Permitting Authority for the majority of discharges within their respective states. The State of Missouri is the NPDES Permitting Authority for all discharges within its state.

<u>Permit No.</u>	<u>Areas of coverage/where EPA is Permitting Authority</u>
IAR10000I	Indian country within the State of Iowa
KSR10000I	Indian country within the State of Kansas
NER10000I	Indian country within the State of Nebraska, except Pine Ridge Reservation lands (see Region 8)

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**8. EPA Region 8: CO, MT, ND, SD, WY, UT (except see Region 9 for Goshute Reservation and Navajo Reservation Lands), the Ute Mountain Reservation in NM, and the Pine Ridge Reservation in NE.**

US EPA, Region 08  
NPDES Storm Water Program  
999 18th St, Suite 300  
(EPR-EP)  
Denver, CO 80202-2466

The States of Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming are the NPDES Permitting Authority for the majority of discharges within their respective states.

<u>Permit No.</u>	<u>Areas of coverage/where EPA is Permitting Authority</u>
<b>COR10000F</b>	Federal Facilities in the State of Colorado, except those located on Indian country
<b>COR10000I</b>	Indian country within the State of Colorado, as well as the portion of the Ute Mountain Reservation located in New Mexico
<b>MTR10000I</b>	Indian country within the State of Montana
<b>NDR10000I</b>	Indian country within the State of North Dakota, as well as that portion of the Standing Rock Reservation located in South Dakota (except for the portion of the lands within the former boundaries of the Lake Traverse Reservation which is covered under South Dakota permit SDR10000I listed below)
<b>SDR10000I</b>	Indian country within the State of South Dakota, as well as the portion of the Pine Ridge Reservation located in Nebraska and the portion of the lands within the former boundaries of the Lake Traverse Reservation located in North Dakota (except for the Standing Rock Reservation which is covered under North Dakota permit NDR10000I listed above)
<b>UTR10000I</b>	Indian country within the State of Utah, except Goshute and Navajo Reservation lands (see Region 9)
<b>WYR10000I</b>	Indian country within the State of Wyoming

**9. EPA Region 9: CA, HI, NV, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, the Goshute Reservation in UT and NV, the Navajo Reservation in UT, NM, and AZ, the Duck Valley Reservation in ID, and the Fort McDermitt Reservation in OR.**

US EPA, Region 09  
NPDES Storm Water Program  
75 Hawthorne St  
San Francisco, CA 94105-3901

The States of Arizona, California and Nevada are the NPDES Permitting Authority for the majority of discharges within their respective states. The State of Hawaii is the NPDES Permitting Authority for all discharges within its state.

<u>Permit No.</u>	<u>Areas of coverage/where EPA is Permitting Authority</u>
<b>ASR100000</b>	The Island of American Samoa
<b>AZR10000I</b>	Indian country within the State of Arizona, as well as Navajo Reservation lands in New Mexico and Utah
<b>CAR10000I</b>	Indian country within the State of California
<b>GUR100000</b>	The Island of Guam
<b>JAR100000</b>	Johnston Atoll
<b>MWR100000</b>	Midway Island and Wake Island
<b>NIR100000</b>	Commonwealth of the Northern Mariana Islands
<b>NVR10000I</b>	Indian country within the State of Nevada, as well as the Duck Valley Reservation in Idaho, the Fort McDermitt Reservation in Oregon and the Goshute Reservation in Utah



**10. EPA Region 10: AK, WA, ID (except see Region 9 for Duck Valley Reservation Lands), and OR (except see Region 9 for Fort McDermitt Reservation).**

US EPA, Region 10  
NPDES Storm Water Program  
1200 6th Ave (OW-130)  
Seattle, WA 98101-1128  
Phone: (206) 553-6650

The States of Oregon and Washington are the NPDES Permitting Authority for the majority of discharges within their respective states.

<u>Permit No.</u>	<u>Areas of coverage/where EPA is Permitting Authority</u>
<b>AKR100000</b>	The State of Alaska, except Indian country
<b>AKR10000I</b>	Indian country within the state of Alaska
<b>IDR100000</b>	The State of Idaho, except Indian country
<b>IDR10000I</b>	Indian country within the State of Idaho, except Duck Valley Reservation lands (see Region 9)
<b>ORR10000I</b>	Indian country within the State of Oregon, except Fort McDermitt Reservation lands (see Region 9)
<b>WAR10000F</b>	Federal Facilities in the State of Washington, except those located on Indian country
<b>WAR10000I</b>	Indian country within the State of Washington

## Appendix C - Endangered Species Act Review Procedures

You must meet at least one of the six criteria in Subpart 1.3.C.6 to be eligible for coverage under this permit. You must follow the procedures in this Appendix to assess the potential effects of storm water discharges and storm water discharge-related activities on listed species and their critical habitat. When evaluating these potential effects, operators must evaluate the entire project area.

For purposes of this Appendix, the term "project area" is inclusive of the term "Action Area." Action area is defined in 50 CFR §402.02 as all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action. This includes areas beyond the footprint of the construction area that may be affected by storm water discharges and storm water discharge related activities. "Project area" is defined in Appendix A.

(Operators who are eligible and able to certify eligibility under Criterion B, C, D, or F of Subpart 1.3.C.6 because of a previously issued ESA section 10 permit, a previously completed ESA section 7 consultation, or because the operator's activities were already addressed in another operator's certification of eligibility may proceed directly to Step Four.)

### Step One: Determine if Listed Threatened or Endangered Species are Present On or Near Your Project Area

You must determine, to the best of your knowledge, whether listed species are located on or near your project area. To make this determination, you should:

- Determine if listed species are in your county or township. The local offices of the U.S. Fish and Wildlife Service (FWS), National Marine Fisheries Service (NMFS), and State or Tribal Heritage Centers often maintain lists of federally listed endangered or threatened species on their internet sites. Visit [www.epa.gov/npdes/stormwater/cgp](http://www.epa.gov/npdes/stormwater/cgp) to find the appropriate site for your state or check with your local office. In most cases, these lists allow you to determine if there are listed species in your county or township.
- If there are listed species in your county or township, check to see if critical habitat has been designated and if that area overlaps or is near your project area.
- Contact your local FWS, NMFS, or State or Tribal Heritage Center to determine if the listed species could be found on or near your project area and if any critical habitat areas have been designated that overlap or are near your project area. Critical habitat areas maybe designated independently from the listed species for your county, so even if there are no listed species in your county or township, you must still contact one of the agencies mentioned above to determine if there are any critical habitat areas on or near your project area.

You can also find critical habitat designations and associated requirements at 50 CFR Parts 17 and 226. <http://www.access.gpo.gov>.

- If there are no listed species in your county or township, no critical habitat areas on or near your project area, or if your local FWS, NMFS, or State or Tribal Heritage Center indicates that listed species are not a concern in your part of the county or township, you may check box A on the Notice of Intent Form.
- If there are listed species and if your local FWS, NMFS, or State or Tribal Heritage Center indicates that these species could exist on or near your project area, you will need to do one or more of the following:
  - Conduct visual inspections: This method may be particularly suitable for construction sites that are smaller in size or located in non-natural settings such as highly urbanized areas or industrial parks where there is little or no natural habitat, or for construction activities that discharge directly into municipal storm water collection systems.
  - Conduct a formal biological survey. In some cases, particularly for larger construction sites with extensive storm water discharges, biological surveys may be an appropriate way to assess whether species are located on or near the project area and whether there are likely adverse effects to such species. Biological surveys are frequently performed by environmental consulting firms. A biological survey may in some cases be useful in conjunction with Steps Two, Three, or Four of these instructions.
  - Conduct an environmental assessment under the National Environmental Policy Act (NEPA). Such reviews may indicate if listed species are in proximity to the project area. Coverage under the CGP does not trigger such a review because the CGP does not regulate new sources (that is, dischargers subject to New Source Performance Standards under section 306 of the Clean Water Act), and is thus statutorily

exempted from NEPA. See CWA section 511(c). However, some construction activities might require review under NEPA for other reasons such as federal funding or other federal involvement in the project.

If listed threatened or endangered species or critical habitat are present in the project area, you must look at impacts to species and/or habitat when following Steps Two through Four. Note that many but not all measures imposed to protect listed species under these steps will also protect critical habitat. Thus, meeting the eligibility requirements of this CGP may require measures to protect critical habitat that are separate from those to protect listed species.

### **Step Two: Determine if the Construction Activity's Storm Water Discharges or Storm Water Discharge-Related Activities Are Likely to Adversely Affect Listed Threatened or Endangered Species or Designated Critical Habitat**

To receive CGP coverage, you must assess whether your storm water discharges or storm water discharge-related activities is likely to adversely affect listed threatened or endangered species or designated critical habitat that are present on or near your project area.

Potential adverse effects from storm water discharges and storm water discharge-related activities include:

- *Hydrological.* Storm water discharges may cause siltation, sedimentation or induce other changes in receiving waters such as temperature, salinity or pH. These effects will vary with the amount of storm water discharged and the volume and condition of the receiving water. Where a storm water discharge constitutes a minute portion of the total volume of the receiving water, adverse hydrological effects are less likely. Construction activity itself may also alter drainage patterns on a site where construction occurs that can impact listed species or critical habitat.
- *Habitat.* Excavation, site development, grading, and other surface disturbance activities from construction activities, including the installation or placement of storm water BMPs, may adversely affect listed species or their habitat. Storm water may drain or inundate listed species habitat.
- *Toxicity.* In some cases, pollutants in storm water may have toxic effects on listed species.

The scope of effects to consider will vary with each site. If you are having difficulty determining whether your project is likely to adversely affect listed species or critical habitat, or one of the Services has already raised concerns to you, you must contact the appropriate office of the FWS, NMFS or Natural Heritage Center for assistance. If adverse effects are not likely, then you may check box E on the NOI form and apply for coverage under the CGP. If the discharge may adversely effect listed species or critical habitat, you must follow Step Three.

### **Step Three: Determine if Measures Can Be Implemented to Avoid Adverse Effects**

If you make a preliminary determination that adverse effects are likely to occur, you can still receive coverage under Criterion E of Subpart 1.3.C.6 of the CGP if appropriate measures are undertaken to avoid or eliminate the likelihood of adverse effects prior to applying for CGP coverage. These measures may involve relatively simple changes to construction activities such as re-routing a storm water discharge to bypass an area where species are located, relocating BMPs, or by changing the "footprint" of the construction activity. You should contact the FWS and/or NMFS to see what appropriate measures might be suitable to avoid or eliminate the likelihood of adverse impacts to listed species and/or critical habitat. (See 50 CFR §402.13(b)). This can entail the initiation of informal consultation with the FWS and/or NMFS (described in more detail in Step Four).

If you adopt measures to avoid or eliminate adverse affects, you must continue to abide by those measures for the duration of the construction project and coverage under the CGP. These measures must be described in the SWPPP and are enforceable CGP conditions and/or conditions for meeting the eligibility criteria in Subpart 1.3. If appropriate measures to avoid the likelihood of adverse effects are not available, you must follow Step Four.

### **Step Four: Determine if the Eligibility Requirements of Criterion B, C, D, or F of Subpart 1.3.C.6 Can Be Met**

Where adverse effects are likely, you must contact the FWS and/or NMFS. You may still be eligible for CGP coverage if any likely adverse effects can be addressed through meeting Criterion B, C, D, or F of Subpart 1.3.C.6 of the CGP. These criteria are as follows:

1. *An ESA Section 7 Consultation Is Performed for Your Activity (See Criterion B or C of Subpart 1.3.C.6 of the CGP).*

Formal or informal ESA section 7 consultation is performed with the FWS and/or NMFS that addresses the effects of your storm water discharges and storm water discharge-related activities on federally-listed and threatened

species and designated critical habitat. FWS and/or NMFS may request that consultation take place if any actions are identified that may affect listed species or critical habitat. In order to be eligible for coverage under this permit, consultation must result in a "no jeopardy opinion" or a written concurrence by the Service(s) on a finding that your storm water discharge(s) and storm water discharge-related activities are not likely to adversely affect listed species or critical habitat (For more information on consultation, see 50 CFR §402). If you receive a "jeopardy opinion," you may continue to work with the FWS and/or NMFS and your permitting authority to modify your project so that it will not jeopardize listed species or designated critical habitat.

Most consultations are accomplished through informal consultation. By the terms of this CGP, EPA has automatically designated operators as non-federal representatives for the purpose of conducting informal consultations. See Subpart 1.3.C.6 and 50 CFR §402.08 and §402.13. When conducting informal ESA section 7 consultation as a non-federal representative, you must follow the procedures found in 50 CFR Part 402 of the ESA regulations. You must notify FWS and/or NMFS of your intention and agreement to conduct consultation as a non-federal representative.

Consultation may occur in the context of another federal action at the construction site (e.g., where ESA section 7 consultation was performed for issuance of a wetlands dredge and fill permit for the project or where a NEPA review is performed for the project that incorporates a section 7 consultation). Any terms and conditions developed through consultations to protect listed species and critical habitat must be incorporated into the SWPPP. As noted above, operators may, if they wish, initiate consultation with the Services at Step Four.

Whether ESA section 7 consultation must be performed with either the FWS, NMFS or both Services depends on the listed species that may be affected by the operator's activity. In general, NMFS has jurisdiction over marine, estuaries, and anadromous species. Operators should also be aware that while formal section 7 consultation provides protection from incidental takings liability, informal consultation does not.

*2. An Incidental Taking Permit Under Section 10 of the ESA is Issued for the Operators Activity (See Criterion D of Subpart 1.3.C.6 of the CGP).*

Your construction activities are authorized through the issuance of a permit under section 10 of the ESA and that authorization addresses the effects of your storm water discharge(s) and storm water discharge-related activities on federally-listed species and designated critical habitat. You must follow FWS and/or NMFS procedures when applying for an ESA Section 10 permit (see 50 CFR §17.22(b)(1) for FWS and §222.22 for NMFS). Application instructions for section 10 permits for FWS and NMFS can be obtained by accessing the FWS and NMFS websites (<http://www.fws.gov> and <http://www.nmfs.noaa.gov>) or by contacting the appropriate FWS and NMFS regional office.

*3. You are Covered Under the Eligibility Certification of Another Operator for the Project Area (See Criterion F of Subpart 1.3.C.6 of the CGP).*

Your storm water discharges and storm water discharge-related activities were already addressed in another operator's certification of eligibility under Criteria A through E of Subpart 1.3.C.6 which also included your project area. For example, a general contractor or developer may have completed and filed an NOI for the entire project area with the necessary Endangered Species Act certifications (criteria A-E), subcontractors may then rely upon that certification and must comply with any conditions resulting from that process. By certifying eligibility under Criterion F of Subpart 1.3.C.6, you agree to comply with any measures or controls upon which the other operator's certification under Criterion B, C, or D of Subpart 1.3.C.6 was based. Certification under Criterion F of Subpart 1.3.C.6 is discussed in more detail in the Fact Sheet that accompanies this permit.

You must comply with any terms and conditions imposed under the eligibility requirements of Criterion A through F to ensure that your storm water discharges and storm water discharge-related activities are protective of listed species and/or critical habitat. Such terms and conditions must be incorporated in the project's SWPPP. If the eligibility requirements of Subpart 1.3.C.6 cannot be met, then you are not eligible for coverage under the CGP. In these instances, you may consider applying to EPA for an individual permit.

## Appendix D - Small Construction Waivers and Instructions

These waivers are only available to storm water discharges associated with small construction activities (i.e., 1-5 acres). As the operator of a small construction activity, you may be able to qualify for a waiver in lieu of needing to obtain coverage under this general permit based on: (A) a low rainfall erosivity factor, (B) a TMDL analysis, or (C) an equivalent analysis that determines allocations for small construction sites are not needed. Each operator, otherwise needing permit coverage, must notify EPA of its intention for a waiver. It is the responsibility of those individuals wishing to obtain a waiver from coverage under this general permit to submit a complete and accurate waiver certification as described below. Where the operator changes or another is added during the construction project, the new operator must also submit a waiver certification to be waived.

### A. Rainfall Erosivity Waiver

Under this scenario the small construction project's rainfall erosivity factor calculation ("R" in the Revised Universal Soil Loss Equation) is less than 5 during the period of construction activity. The operator must certify to the Permitting Authority that construction activity will occur only when the rainfall erosivity factor is less than 5. The period of construction activity begins at initial earth disturbance and ends with final stabilization. Where vegetation will be used for final stabilization, the date of installation of a stabilization practice that will provide interim non-vegetative stabilization can be used for the end of the construction period, provided the operator commits (as a condition of waiver eligibility) to periodically inspect and properly maintain the area until the criteria for final stabilization as defined in the construction general permit have been met. If use of this interim stabilization eligibility condition was relied on to qualify for the waiver, signature on the waiver with its certification statement constitutes acceptance of and commitment to complete the final stabilization process. The operator must submit a waiver certification to EPA prior to commencing construction activities.

*Note: The rainfall erosivity factor "R" is determined in accordance with Chapter 2 of Agriculture Handbook Number 703, Predicting Soil Erosion by Water: A Guide to Conservation Planning With the Revised Universal Soil Loss Equation (RUSLE), pages 21-64, dated January 1997; United States Department of Agriculture (USDA), Agricultural Research Service.*

EPA funded a cooperative agreement with Texas A&M University to develop an online rainfall erosivity calculator. You can access the calculator from EPA's website at: [www.epa.gov/npdes/stormwater/cgp](http://www.epa.gov/npdes/stormwater/cgp). Use of the calculator allows you to determine potential eligibility for the rainfall erosivity waiver. It may also be useful in determining the time periods during which construction activity could be waived from permit coverage. You may find that moving your construction activity by a few weeks or expediting site stabilization will allow you to qualify for the waiver.

If you are the operator of the construction activity and eligible for a waiver based on low erosivity potential, you must provide the following information on the waiver certification in order to be waived from permitting requirements:

1. Name, address and telephone number of the construction site operators;
2. Name (or other identifier), address, county or similar governmental subdivision, and latitude/longitude of the construction project or site;
3. Estimated construction start and completion (i.e., final stabilization) dates, and total acreage (to the nearest quarter acre) to be disturbed;
4. The rainfall erosivity factor calculation that applies to the active construction phase at your project site; and
5. A statement, signed and dated by an authorized representative as provided in Appendix G, Subsection 11, that certifies that the construction activity will take place during a period when the value of the rainfall erosivity factor is less than five.

At the time of publication, a Low Erosivity Waiver Form is not available. If EPA does create a form, it will be noticed (either directly, by public notice, or by making information available on the Internet at [www.epa.gov/npdes/stormwater/cgp](http://www.epa.gov/npdes/stormwater/cgp)).

*Note: If the R factor is 5 or greater, you cannot apply for the rainfall erosivity waiver, and must apply for permit coverage as per Subpart 2.1 of the construction general permit, unless you qualify for the Water Quality Waiver as described below.*

If your small construction project continues beyond the projected completion date given on the waiver certification, you must recalculate the rainfall erosivity factor for the new project duration. If the R factor is below five (5), you

must update all applicable information on the waiver certification and retain a copy of the revised waiver as part of the site SWPPP. The new waiver certification must be submitted prior to the projected completion date listed on the original waiver form to assure your exemption from permitting requirements is uninterrupted. If the new R factor is five (5) or above, you must submit an NOI as per Part 2.

**B. TMDL Waiver**

This waiver is available if EPA has established or approved a TMDL that addresses the pollutant(s) of concern and has determined that controls on storm water discharges from small construction activity are not needed to protect water quality. The pollutant(s) of concern include sediment (such as total suspended solids, turbidity or siltation) and any other pollutant that has been identified as a cause of impairment of any water body that will receive a discharge from the construction activity. Information on TMDLs that have been established or approved by EPA is available from EPA online at <http://www.epa.gov/owow/tmdl/> and from state and tribal water quality agencies.

If you are the operator of the construction activity and eligible for a waiver based on compliance with an EPA established or approved TMDL, you must provide the following information on the Waiver Certification form in order to be waived from permitting requirements:

1. Name, address and telephone number of the construction site operator(s);
2. Name (or other identifier), address, county or similar governmental subdivision, and latitude/longitude of the construction project or site;
3. Estimated construction start and completion (i.e., final stabilization) dates, and total acreage (to the nearest quarter acre) to be disturbed;
4. The name of the water body(s) that would be receiving storm water discharges from your construction project;
5. The name and approval date of the TMDL;
6. A statement, signed and dated by an authorized representative as provided in Appendix G, Subsection 11, that certifies that the construction activity will take place and that the storm water discharges will occur, within the drainage area addressed by the TMDL.

**C. Equivalent Analysis Waiver**

This waiver is available for non-impaired waters only. The operator can develop an equivalent analysis that determines allocations for his small construction site for the pollutant(s) of concern or determines that such allocations are not needed to protect water quality. This waiver requires a small construction operator to develop an equivalent analysis based on existing in-stream concentrations, expected growth in pollutant concentrations from all sources, and a margin of safety.

If you are a construction operator who wants to use this waiver, you must develop your equivalent analysis and provide the following information to be waived from permitting requirements:

1. Name, address and telephone number of the construction site operator(s);
2. Name (or other identifier), address, county or similar governmental subdivision, and latitude/longitude of the construction project or site;
3. Estimated construction start and completion (i.e., final stabilization) dates, and total acreage (to the nearest quarter acre) to be disturbed;
4. The name of the water bodies that would be receiving storm water discharges from your construction project;
5. Your equivalent analysis;
6. A statement, signed and dated by an authorized representative as provided in Appendix G, Subsection 11, that certifies that the construction activity will take place and that the storm water discharges will occur, within the drainage area addressed by the equivalent analysis.

**D. Waiver Deadlines and Submissions**

1. Waiver certifications must be submitted prior to commencement of construction activities.

2. If you submit a TMDL or equivalent analysis waiver request, you are not waived until EPA approves your request. As such, you may not commence construction activities until receipt of approval from EPA.
3. Late Notifications: Operators are not prohibited from submitting waiver certifications after initiating clearing, grading, excavation activities, or other construction activities. The Agency reserves the right to take enforcement for any unpermitted discharges or permit noncompliance that occur between the time construction commenced and waiver authorization is granted.

Submittal of a waiver certification is an optional alternative to obtaining permit coverage for discharges of storm water associated with small construction activity, provided you qualify for the waiver. Any discharge of storm water associated with small construction activity not covered by either a permit or a waiver may be considered an unpermitted discharge under the Clean Water Act. As mentioned above, EPA reserves the right to take enforcement for any unpermitted discharges or permit noncompliance that occur between the time construction commenced and either discharge authorization is granted or a complete and accurate waiver certification is submitted. EPA may notify any operator covered by a waiver that they must apply for a permit. EPA may notify any operator who has been in non-compliance with a waiver that they may no longer use the waiver for future projects. Any member of the public may petition EPA to take action under this provision by submitting written notice along with supporting justification.

Complete and accurate Rainfall Erosivity waiver certifications must be sent to the following address:

Regular U.S. Mail Delivery

EPA Storm Water Notice Processing Center  
Mail Code 4203M  
U.S. EPA  
1200 Pennsylvania Avenue, NW  
Washington, DC 20460

Overnight/Express Mail Delivery

EPA Storm Water Notice Processing Center  
Room 7420  
U.S. EPA  
1201 Constitution Avenue, NW  
Washington, DC 20004

Complete and accurate TMDL or equivalent analysis waiver requests must be sent to the applicable EPA Region office specified in Appendix B.

**Appendix E - Notice of Intent Form and Instructions**

From the effective date of this permit, operators are to use the Notice of Intent Form contained in this Appendix to obtain permit coverage.







Instructions for Completing EPA Form 3510-9

**Notice of Intent (NOI) for Storm Water Discharges Associated with  
Construction Activity Under an NPDES General Permit**

NPDES Form

This Form Replaces Form 3510-9 (8/98)

Form Approved OMB Nos. 2040-0188 and 2040-0211

**Who Must File an NOI Form**

Under the provisions of the Clean Water Act, as amended (33 U.S.C. 1251 et seq.; the Act), federal law prohibits storm water discharges from certain construction activities to waters of the U.S. unless that discharge is covered under a National Pollutant Discharge Elimination System (NPDES) Permit. Operator(s) of construction sites where one or more acres are disturbed, smaller sites that are part of a larger common plan of development or sale where there is a cumulative disturbance of at least one acre, or any other site specifically designated by the Director, must submit an NOI to obtain coverage under an NPDES general permit. Each person, firm, public organization, or any other entity that meets either of the following criteria must file this form: (1) they have operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or (2) they have day-to-day operational control of those activities at the project necessary to ensure compliance with SWPPP requirements or other permit conditions. If you have questions about whether you need an NPDES storm water permit, or if you need information to determine whether EPA or your state agency is the permitting authority, refer to [www.epa.gov/npdes/stormwater/cgp](http://www.epa.gov/npdes/stormwater/cgp) or telephone the Storm Water Notice Processing Center at (866) 352-7755.

**Where to File NOI Form**

See the applicable CGP for information on where to send your completed NOI form.

**Completing the Form**

Obtain and read a copy of the appropriate EPA Storm Water Construction General Permit for your area. To complete this form, type or print, using uppercase letters, in the appropriate areas only. Please place each character between the marks (abbreviate if necessary to stay within the number of characters allowed for each item). Use one space for breaks between words, but not for punctuation marks unless they are needed to clarify your response. If you have any questions on this form, refer to [www.epa.gov/npdes/stormwater/cgp](http://www.epa.gov/npdes/stormwater/cgp) or telephone the Storm Water Notice Processing Center at (866) 352-7755. Please submit original document with signature in ink - do not send a photocopied signature.

**Section I. Permit Number**

Provide the number of the permit under which you are applying for coverage (see Appendix B of the general permit for the list of eligible permit numbers).

**Section II. Operator Information**

Provide the legal name of the person, firm, public organization, or any other entity that operates the project described in this

application. An operator of a project is a legal entity that controls at least a portion of site operations and is not necessarily the site manager. Provide the employer identification number (EIN from the Internal Revenue Service; IRS), also commonly referred to as your taxpayer ID. If the applicant does not have an EIN enter "NA" in the space provided. Also provide the operator's mailing address, telephone number, fax number (optional) and e-mail address (if you would like to be notified via e-mail of NOI approval when available). Correspondence for the NOI will be sent to this address.

**Section III. Project/Site Information**

Enter the official or legal name and complete street address, including city, state, zip code, and county or similar government subdivision of the project or site. If the project or site lacks a street address, indicate the general location of the site (e.g., Intersection of State Highways 61 and 34). Complete site information must be provided for permit coverage to be granted.

The applicant must also provide the latitude and longitude of the facility either in degrees, minutes, seconds; degrees, minutes, decimal; or decimal format. The latitude and longitude of your facility can be determined in several different ways, including through the use of global positioning system (GPS) receivers, U.S. Geological Survey (U.S.G.S.) topographic or quadrangle maps, and EPA's web-based siting tools, among others. Refer to [www.epa.gov/npdes/stormwater/cgp](http://www.epa.gov/npdes/stormwater/cgp) for further guidance on the use of these methodologies. For consistency, EPA requests that measurements be taken from the approximate center of the construction site. Applicants must specify which method they used to determine latitude and longitude. If a U.S.G.S. topographic map is used, applicants are required to specify the scale of the map used.

Indicate whether the project is in Indian country, and if so, provide the name of the Reservation. If the project is in Indian Country Lands that are not part of a Reservation, indicate "not applicable" in the space provided.

Enter the estimated construction start and completion dates using four digits for the year (i.e., 05/27/1998). Enter the estimated area to be disturbed including but not limited to: grubbing, excavation, grading, and utilities and infrastructure installation. Indicate to the nearest quarter acre. Note: 1 acre = 43,560 sq. ft.

**Section IV. SWPPP Information**

Indicate whether or not the SWPPP was prepared in advance of filing the NOI form. Check the appropriate box for the location where the SWPPP may be viewed. Provide the name,

**Notice of Intent (NOI) for Storm Water Discharges Associated with Construction Activity Under an NPDES General Permit**

NPDES Form

This Form Replaces Form 3510-9 (8/98)

Form Approved OMB Nos. 2040-0188 and 2040-0211

fax number (optional), and e-mail address (optional) of the contact person if different than that listed in Section II of the NOI form.

**Section V. Discharge Information**

Enter the name(s) of receiving waterbodies to which the project's storm water will discharge. These should be the first bodies of water that the discharge will reach. (Note: If you discharge to more than one waterbody, please indicate all such waters in the space provided and attach a separate sheet if necessary.) For example, if the discharge leaves your site and travels through a roadside swale or a storm sewer and then enters a stream that flows to a river, the stream would be the receiving waterbody. Waters of the U.S. include lakes, streams, creeks, rivers, wetlands, impoundments, estuaries, bays, oceans, and other surface bodies of water within the confines of the U.S. and U.S. coastal waters. Waters of the U.S. do not include man-made structures created solely for the purpose of wastewater treatment. U.S. Geological Survey topographical maps may be used to make this determination. If the map does not provide a name, use a format such as "unnamed tributary to Cross Creek". If you discharge into a municipal separate storm sewer system (MS4), you must identify the waterbody into which that portion of the storm sewer discharges. That information should be readily available from the operator of the MS4.

Indicate whether your storm water discharges from construction activities will be consistent with the assumptions and requirements of applicable EPA approved or established TMDL(s). To answer this question, refer to [www.epa.gov/npdes/stormwater/cgp](http://www.epa.gov/npdes/stormwater/cgp) for state- and regional-specific TMDL information related to the construction general permit. You may also have to contact your EPA regional office or state agency. If there are no applicable TMDLs or no related requirements, please check the "yes" box in the NOI form.

**Section VI. Endangered Species Information**

Indicate for which criterion (i.e., A, B, C, D, E, or F) of the permit the applicant is eligible with regard to protection of federally listed endangered and threatened species, and designated critical habitat. See Part 1.3.C.6 and Appendix C of the permit. If you select criterion F, provide the permit tracking number of the operator under which you are certifying eligibility. The permit tracking number is the number assigned to the operator by the Storm Water Notice Processing Center after EPA acceptance of a complete NOI.

**Section VII. Certification Information**

All applications, including NOIs, must be signed as follows:  
*For a corporation:* By a responsible corporate officer. For the purpose of this Section, a responsible corporate officer means:

(i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

*For a partnership or sole proprietorship:* By a general partner or the proprietor, respectively; or

*For a municipality, state, federal, or other public agency:* By either a principal executive officer or ranking elected official. For purposes of this Part, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

Include the name and title of the person signing the form and the date of signing. An unsigned or undated NOI form will not be considered eligible for permit coverage.

**Paperwork Reduction Act Notice**

Public reporting burden for this application is estimated to average 3.7 hours. This estimate includes time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments regarding the burden estimate, any other aspect of the collection of information, or suggestions for improving this form, including any suggestions which may increase or reduce this burden to: Chief, Information Policy Branch 2136, U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue, NW, Washington, D.C. 20460. Include the OMB control number on any correspondence. Do not send the completed form to this address.

**Appendix F - Notice of Termination Form and Instructions**

From the effective date of this permit, operators are to use the Notice of Termination Form contained in this Appendix to terminate permit coverage.

NPDES  
Form



United States Environmental Protection Agency  
Washington, DC 20460  
**Notice of Termination (NOT) of Coverage Under an NPDES General Permit for Storm  
Water Discharges Associated with Construction Activity**

Submission of this Notice of Termination constitutes notice that the party identified in Section II of this form is no longer authorized to discharge storm water associated with construction activity under the NPDES program from the site identified in Section III of this form. All necessary information must be included on this form. Refer to the instructions at the end of this form.

**II. General Information**

NPDES Storm Water General Permit Tracking Number:

Reason for Termination (Check only one):

Final stabilization has been achieved on all portions of the site for which you are responsible.

Another operator has assumed control, according to Appendix G, Section 11.C of the CGP, over all areas of the site that have not been finally stabilized.

Coverage under an alternative NPDES permit has been obtained.

For residential construction only, temporary stabilization has been completed and the residence has been transferred to the homeowner.

**III. Operator Information**

Name:

IRS Employer Identification Number (EIN):  -

**Mailing Address:**

Street:

City:  State:  Zip Code:  -

Phone:  -  -  Fax (optional):  -  -

E-mail (optional):

**IV. Project/ Site Information**

Project/ Site Name:

Project Street/ Location:

City:  State:  Zip Code:  -

County or similar government subdivision:

**V. Certification Information**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print Name:

Print Title:

Signature:

Date:

Instructions for Completing EPA Form 3510-13  
**Notice of Termination (NOT) of Coverage Under an NPDES General Permit for  
Storm Water Discharges Associated with Construction Activity**

NPDES Form

This Form Replaces Form 3517-7 (8-98)

Form Approved OMB Nos. 2040-0086 and 2040-0211

**Who May File an NOT Form**

Permittees who are presently covered under the EPA-issued National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction Activity may submit an NOT form when final stabilization has been achieved on all portions of the site for which you are responsible; another operator has assumed control in accordance with Appendix G, Section 11.C of the General Permit over all areas of the site that have not been finally stabilized; coverage under an alternative NPDES permit has been obtained; or for residential construction only, temporary stabilization has been completed and the residence has been transferred to the homeowner.

"Final stabilization" means that all soil disturbing activities at the site have been completed and that a uniform perennial vegetative cover with a density of at least 70% of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or equivalent permanent stabilization measures (such as the use of riprap, gablons, or geotextiles) have been employed. See "final stabilization" definition in Appendix A of the Construction General Permit for further guidance where background native vegetation covers less than 100 percent of the ground, in arid or semi-arid areas, for individual lots in residential construction, and for construction projects on land used for agricultural purposes.

**Completing the Form**

Type or print, using uppercase letters, in the appropriate areas only. Please place each character between the marks. Abbreviate if necessary to stay within the number of characters allowed for each item. Use only one space for breaks between words, but not for punctuation marks unless they are needed to clarify your response. If you have any questions about this form, refer to [www.epa.gov/npdes/stormwater/cgp](http://www.epa.gov/npdes/stormwater/cgp) or telephone the Storm Water Notice Processing Center at (866) 352-7755. Please submit original document with signature in ink - do not send a photocopied signature.

**Section I. Permit Number**

Enter the existing NPDES Storm Water General Permit Tracking Number assigned to the project by EPA's Storm Water Notice Processing Center. If you do not know the permit tracking number, refer to [www.epa.gov/npdes/stormwater/cgp](http://www.epa.gov/npdes/stormwater/cgp) or contact the Storm Water Notice Processing Center at (866) 352-7755.

Indicate your reason for submitting this Notice of Termination by checking the appropriate box. Check only one:

*Final stabilization has been achieved on all portions of the site for which you are responsible.*

*Another operator has assumed control according to Appendix G, Section 11.C over all areas of the site that have not been finally stabilized.*

*Coverage under an alternative NPDES permit has been obtained.*

*For residential construction only, if temporary stabilization has been completed and the residence has been transferred to the homeowner.*

**Section II. Operator Information**

Provide the legal name of the person, firm, public organization, or any other entity that operates the project described in this application and is covered by the permit tracking number identified in Section I. The

operator of the project is the legal entity that controls the site operation, rather than the site manager. Provide the employer identification number (EIN from the Internal Revenue Service; IRS). If the applicant does not have an EIN enter "NA" in the space provided. Enter the complete mailing address and telephone number of the operator. *Optional:* enter the fax number and e-mail address of the operator.

**Section III. Project/Site Information**

Enter the official or legal name and complete street address, including city, state, zip code, and county or similar government subdivision of the project or site. If the project or site lacks a street address, indicate the general location of the site (e.g., Intersection of State Highways 61 and 34). Complete site information must be provided for termination of permit coverage to be valid.

**Section IV. Certification Information**

All applications, including NOIs, must be signed as follows:

*For a corporation:* By a responsible corporate officer. For the purpose of this Part, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

*For a partnership or sole proprietorship:* By a general partner or the proprietor, respectively; or

*For a municipality, state, federal, or other public agency:* By either a principal executive officer or ranking elected official. For purposes of this Part, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

Include the name and title of the person signing the form and the date of signing. An unsigned or undated NOT form will not be considered valid termination of permit coverage.

**Paperwork Reduction Act Notice**

Public reporting burden for this application is estimated to average 0.5 hours per notice, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments regarding the burden estimate, any other aspect of the collection of information, or suggestions for improving this form including any suggestions which may increase or reduce this burden to: Chief, Information Policy Branch, 2136, U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue, NW, Washington, DC 20460. Include the OMB number on any correspondence. Do not send the completed form to this address.

**Appendix G - Standard Permit Conditions****STANDARD PERMIT CONDITIONS****1. Duty To Comply**

You must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

- A. You must comply with effluent standards or prohibitions established under section 307(a) of the Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.
- B. The Clean Water Act provides that any person who violates section 301, 302, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any such sections in a permit issued under section 402, or any requirement imposed in a pretreatment program approved under sections 402(a)(3) or 402(b)(8) of the Act, is subject to a civil penalty not to exceed the maximum amounts authorized by Section 309(d) of the Act and the Federal Civil Penalties Inflation Adjustment Act (28 U.S.C. §2461 note) as amended by the Debt Collection Improvement Act (31 U.S.C. §3701 note) (currently \$27,500 per day for each violation).

The Clean Water Act provides that any person who negligently violates sections 301, 302, 306, 307, 308, 318, or 405 of the Act, or any condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, or any requirement imposed in a pretreatment program approved under section 402(a)(3) or 402(b)(8) of the Act, is subject to criminal penalties of \$2,500 to \$25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than \$50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who knowingly violates such sections, or such conditions or limitations is subject to criminal penalties of \$5,000 to \$50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than \$100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates section 301, 302, 303, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than \$250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than \$500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than \$1,000,000 and can be fined up to \$2,000,000 for second or subsequent convictions.

- C. Any person may be assessed an administrative penalty by the Administrator for violating section 301, 302, 306, 307, 308, 318 or 405 of this Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Pursuant to 40 CFR Part 19 and the Act, administrative penalties for Class I violations are not to exceed the maximum amounts authorized by Section 309(g)(2)(A) of the Act and the Federal Civil Penalties Inflation Adjustment Act (28 U.S.C. §2461 note) as amended by the Debt Collection Improvement Act (31 U.S.C. §3701 note) (currently \$11,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed \$27,500). Pursuant to 40 CFR Part 19 and the Act, penalties for Class II violations are not to exceed the maximum amounts authorized by Section 309(g)(2)(B) of the Act and the Federal Civil Penalties Inflation Adjustment Act (28 U.S.C. §2461 note) as amended by the Debt Collection Improvement Act (31 U.S.C. §3701 note) (currently \$11,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed \$137,500).

**2. Duty to Reapply**

If you wish to continue an activity regulated by this permit after the expiration date of this permit, you must apply for and obtain a new permit.



### 3. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for you in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

### 4. Duty to Mitigate

You must take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

### 5. Proper Operation and Maintenance

You must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by you to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems which are installed by you only when the operation is necessary to achieve compliance with the conditions of this permit.

### 6. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause. Your filing of a request for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

### 7. Property Rights

This permit does not convey any property rights of any sort, or any exclusive privileges.

### 8. Duty to Provide Information

You must furnish to EPA, within a reasonable time, any information which EPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. You must also furnish to EPA upon request, copies of records required to be kept by this permit.

### 9. Inspection and Entry

You must allow EPA, or an authorized representative (including an authorized contractor acting as a representative of the Administrator), upon presentation of credentials and other documents as may be required by law, to:

- A. Enter upon your premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
- B. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
- C. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
- D. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

### 10. Monitoring and Records

- A. Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity.
- B. You must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application. This period may be extended by request of EPA at any time.
- C. Records of monitoring information must include:
  1. The date, exact place, and time of sampling or measurements;
  2. The individual(s) who performed the sampling or measurements;
  3. The date(s) analyses were performed

4. The individual(s) who performed the analyses;
  5. The analytical techniques or methods used; and
  6. The results of such analyses.
- D. Monitoring results must be conducted according to test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, unless other test procedures have been specified in the permit.
- E. The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than \$10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than \$20,000 per day of violation, or by imprisonment of not more than 4 years, or both.

## 11. Signatory Requirements

- A. All applications, including NOIs, must be signed as follows:
1. For a corporation: By a responsible corporate officer. For the purpose of this Part, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
  2. For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or
  3. For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this Part, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).
- B. All reports required by this permit, including SWPPPs, must be signed by a person described in Appendix G, Subsection 11.A above or by a duly authorized representative of that person. A person is a duly authorized representative only if:
1. The authorization is made in writing by a person described in Appendix G, Subsection 11.A;
  2. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and
  3. The signed and dated written authorization is included in the SWPPP. A copy must be submitted to EPA, if requested.
- C. Changes to Authorization. If an authorization under Subpart 2.1 is no longer accurate because a different operator has responsibility for the overall operation of the construction site, a new NOI satisfying the requirements of Subpart 2.1 must be submitted to EPA prior to or together with any reports, information, or applications to be signed by an authorized representative. The change in authorization must be submitted within the time frame specified in Subpart 2.2, and sent to the address specified in Subpart 2.3.
- D. Any person signing documents required under the terms of this permit must include the following certification:
- "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is,

to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

- E. The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

## **12. Reporting Requirements**

- A. **Planned changes.** You must give notice to EPA as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:
1. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR §122.29(b); or
  2. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR §122.42(a)(1).
- B. **Anticipated noncompliance.** You must give advance notice to EPA of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
- C. **Transfers.** This permit is not transferable to any person except after notice to EPA. EPA may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the Clean Water Act. (See 40 CFR §122.61; in some cases, modification or revocation and reissuance is mandatory.)
- D. **Monitoring reports.** Monitoring results must be reported at the intervals specified elsewhere in this permit.
1. Monitoring results must be reported on a Discharge Monitoring Report (DMR) or forms provided or specified by EPA for reporting results of monitoring of sludge use or disposal practices.
  2. If you monitor any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, or as specified in the permit, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by EPA.
  3. Calculations for all limitations which require averaging of measurements must use an arithmetic mean.
- E. **Compliance schedules.** Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date.
- F. **Twenty-four hour reporting.**
1. You must report any noncompliance which may endanger health or the environment. Any information must be provided orally within 24 hours from the time you become aware of the circumstances. A written submission must also be provided within five days of the time you become aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.
  2. The following shall be included as information which must be reported within 24 hours under this paragraph.
    - a. Any unanticipated bypass which exceeds any effluent limitation in the permit. (See 40 CFR §122.41(g).)
    - b. Any upset which exceeds any effluent limitation in the permit
    - c. Violation of a maximum daily discharge limitation for any of the pollutants listed by EPA in the permit to be reported within 24 hours. (See 40 CFR §122.44(g).)

3. EPA may waive the written report on a case-by-case basis for reports under Appendix G, Subsection 12.F.2 if the oral report has been received within 24 hours.
- G. Other noncompliance. You must report all instances of noncompliance not reported under Appendix G, Subsections 12.D, 12.E, and 12.F, at the time monitoring reports are submitted. The reports must contain the information listed in Appendix G, Subsection 12.F.
- H. Other information. Where you become aware that you failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Permitting Authority, you must promptly submit such facts or information.

### **13. Bypass**

#### **A. Definitions.**

1. Bypass means the intentional diversion of waste streams from any portion of a treatment facility
2. Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

#### **B. Bypass not exceeding limitations.** You may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Appendix G, Subsections 13.C and 13.D.

#### **C. Notice—**

1. Anticipated bypass. If you know in advance of the need for a bypass, you must submit prior notice, if possible at least ten days before the date of the bypass.
2. Unanticipated bypass. You must submit notice of an unanticipated bypass as required in Appendix G, Subsection 12.F (24-hour notice).

#### **D. Prohibition of bypass.**

1. Bypass is prohibited, and EPA may take enforcement action against you for bypass, unless:
  - a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
  - b. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
  - c. You submitted notices as required under Appendix G, Subsection 13.C.
2. EPA may approve an anticipated bypass, after considering its adverse effects, if EPA determines that it will meet the three conditions listed above in Appendix G, Subsection 13.D.1.

### **14. Upset**

- A. Definition. Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond your reasonable control. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.
- B. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of Appendix G, Subsection 14.C are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.
- C. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
  1. An upset occurred and that you can identify the cause(s) of the upset;
  2. The permitted facility was at the time being properly operated; and

3. You submitted notice of the upset as required in Appendix G, Subsection 12.F.2.b(24 hour notice).
  4. You complied with any remedial measures required under Appendix G, Section 4.
- D. Burden of proof. In any enforcement proceeding, you, as the one seeking to establish the occurrence of an upset, has the burden of proof.

**EXHIBIT NO. 11**

**PROJECT**  
**CHECK LIST**

# PROJECT CHECKLIST

Project Name: \_\_\_\_\_

Project No.: \_\_\_\_\_

Date: \_\_\_\_\_

(     60%   90%     ) Submittal (circle one)

Review the following checklist and respond "Yes", "No", or "N/A" (not applicable):

\_\_\_\_\_ Has a Plan Executive Summary been completed and attached as per Section 6.3?

\_\_\_\_\_ Has a Drawings Review Checklist been completed?

\_\_\_\_\_ Does this design reflect the project's scope of work?

\_\_\_\_\_ Will additional easements or right-of-way (ROW) be required?

\_\_\_\_\_ ADA Compliance?

\_\_\_\_\_ What permits will be required? State here: \_\_\_\_\_

State here: \_\_\_\_\_

State here: \_\_\_\_\_

\_\_\_\_\_ Have the permits been prepared and submitted to the city?

\_\_\_\_\_ Is the site platted, so that it can be built on?

\_\_\_\_\_ Are there special environmental issues involved?

\_\_\_\_\_ Is this project affected by a floodplain?

\_\_\_\_\_ Are there any special site requirements?

\_\_\_\_\_ Are adequate power/utilities available at/near the site?

\_\_\_\_\_ Have all the existing utilities and facilities been located and indicated on the plans?

\_\_\_\_\_ Have all the existing City-owned utilities been contacted?

\_\_\_\_\_ Wastewater

\_\_\_\_\_ Water

\_\_\_\_\_ Storm Water

\_\_\_\_\_ Gas

\_\_\_\_\_ Streets

\_\_\_\_\_ Will existing and/or future utilities and facilities have an effect on this design?

\_\_\_\_\_ Which regulatory agencies need to review these plans?

State here: \_\_\_\_\_ Contacted : (Name, Phone No.)

State here: \_\_\_\_\_ Contacted : \_\_\_\_\_

State here: \_\_\_\_\_ Contacted : \_\_\_\_\_

\_\_\_\_\_ Which private utility or service agencies need to review these plans?

\_\_\_\_\_ Southwestern Bell Contacted : (Name, Phone No.)

\_\_\_\_\_ Central Power & Light Contacted : \_\_\_\_\_

\_\_\_\_\_ Fiber Optics Contacted : \_\_\_\_\_

\_\_\_\_\_ Other Contacted : \_\_\_\_\_

\_\_\_\_\_ Other Contacted : \_\_\_\_\_

\_\_\_\_\_ Other Contacted : \_\_\_\_\_

\_\_\_\_\_ Other Contacted : \_\_\_\_\_

\_\_\_\_\_ Other Contacted : \_\_\_\_\_

\_\_\_\_\_ Other Contacted : \_\_\_\_\_

\_\_\_\_\_ Other Contacted : \_\_\_\_\_

\_\_\_\_\_ Any special construction sequencing required?

\_\_\_\_\_ Will existing facilities remain in service during construction?

\_\_\_\_\_ Any project soil disposal requirements and/or sites?

\_\_\_\_\_ Soil exploration required?

\_\_\_\_\_ Hazardous material disposal requirements?

\_\_\_\_\_ Any materials to be salvaged and stored or delivered to City?

\_\_\_\_\_ Any contractor lay-down or material areas available?

\_\_\_\_\_ Any special requirements to be incorporated into the project (OSHA trench safety, traffic control, storm water pollution protection)?

State here: \_\_\_\_\_

State here: \_\_\_\_\_

State here: \_\_\_\_\_

\_\_\_\_\_ What building codes affect this project?

State here: \_\_\_\_\_

State here: \_\_\_\_\_

State here: \_\_\_\_\_

\_\_\_\_\_ Design calculations submitted? (As required and attached)

\_\_\_\_\_ Equipment information or selections submitted?



Submitted by: \_\_\_\_\_  
(Firm Name)

\_\_\_\_\_ Date: \_\_\_\_\_  
(Individual), P.E.

Reviewed by: \_\_\_\_\_ Date: \_\_\_\_\_  
(City Representative), P.E.

**EXHIBIT NO. 12**

**DRAWING REVIEW**  
**CHECK LIST**

## DRAWINGS REVIEW CHECKLIST

Project Name: \_\_\_\_\_

Project No.: \_\_\_\_\_

Date: \_\_\_\_\_

(      60%    90%      ) Submittal (circle one)

Review the following checklist and respond "Yes", "No", or "N/A" (not applicable):

\_\_\_\_\_ Are the proposed improvements shown correctly and satisfactorily, in accordance with *City of Corpus Christi Plan Preparation Standards*?

\_\_\_\_\_ Are dimension and clearance interfaces between various discipline drawings correct?

\_\_\_\_\_ Have comments on previous red-lined review sheets been incorporated?

\_\_\_\_\_ Have previous red-lined review sheets been submitted with this review?

\_\_\_\_\_ Is material selection proper?

\_\_\_\_\_ Are the items **constructible** as shown?

\_\_\_\_\_ Are dimensions included, correct, and consistent?

\_\_\_\_\_ Do drafting technique conform to the standards specified in the *City of Corpus Christi Plan Preparation Standards*?

\_\_\_\_\_ Are survey control monuments clearly indicated?

\_\_\_\_\_ Are the drawings legible, clearly delineating proposed work from existing elements?

\_\_\_\_\_ Is a title sheet provided?

\_\_\_\_\_ Do the titles and drawing numbers agree with the title sheet's index list?

\_\_\_\_\_ Are all drawings listed correctly in the contract documents?

\_\_\_\_\_ Are the title blocks completed?

\_\_\_\_\_ Has the appropriate person(s) approved the drawings for submittal?

\_\_\_\_\_ Have the drawings been marked or sealed as required by law?

\_\_\_\_\_ Do legends indicate all symbols used on drawings?

\_\_\_\_\_ Are adequate construction and general notes used?

\_\_\_\_\_ Are adequate and clear details used?

\_\_\_\_\_ Are there north arrows on all plan views?

\_\_\_\_\_ Does each drawing and detail have a scale noted?

\_\_\_\_\_ Are bid items clearly stated?

\_\_\_\_\_ Is there an adequate scope of work cited in paragraph A-3 of the Special Conditions, and does this match the description in the Notice to Bidders?

\_\_\_\_\_ Are all finished floor elevations indicated clearly?

\_\_\_\_\_ Are boring logs exhibited in the contract documents?

Submitted by: \_\_\_\_\_  
(Firm Name)

\_\_\_\_\_ Date: \_\_\_\_\_  
(Individual), P.E.

Reviewed by: \_\_\_\_\_ Date: \_\_\_\_\_  
(City Representative), P.E.

**CONSTRUCTION**  
**PLAN SAMPLE**

**EXHIBIT NO. 13**

**SAMPLES AND**  
**OTHER**  
**GUIDELINES**

# **Exhibit 13**

## **a. NEW Addendum Sealing**

### **Procedures & NEW**

### **Samples of Typical**

## **Addenda in City Format**

**(Revised December 2004)**



City of  
Corpus  
Christi

**TO:** Architectural/Engineering Firms contracting with the City of Corpus Christi

**FROM:** Ángel R. Escobar, P.E., Director of Engineering Services

**DATE:** January 10, 2005


**SUBJECT:** New Sealing Procedures for Addenda during Bid Process

---

Effective February 1, 2005, all future addenda will be required to have the respective A/E Consultant Engineer's name, PE number, seal, signature, and date as described in section 137.33 of the Texas Engineering Practice Act and Rules Concerning the Practice of Engineering and Professional Engineering Licensure published by the Texas Board of Professional Engineers. Therefore, the following procedure for preparing an addendum shall be followed:

1. Consultant prepares addendum
2. Consultant forwards draft addendum to City for review
3. City reviews and sends back comments to Consultant, if any arise
4. Consultant makes revisions and signs and seals addendum with design engineer's name, PE number, signature, and date.
5. Consultant forwards the final, signed and sealed addendum to the City for distribution by the City to plan holders. The City will add a cover letter that will be sent with the addendum.

The draft version of an addendum for a project will be due seven (7) calendar days before the bid date, in order to allow time for revisions and to avoid delaying the bid date. All Consultants are responsible for informing the City of problems that may delay an addendum and/or bid date.

  
\_\_\_\_\_  
Ángel R. Escobar, P.E.  
Director of Engineering Services

Attachments: No.1-Sample Fax Transmission Cover Letter  
No.2-Sample Technical Addendum  
No.3-Sample General Information Addendum



\*\*\*\*\*Sample Format\*\*\*\*\*

**FAX TRANSMISSION**  
Department of Engineering Services  
Major Projects Division  
City of Corpus Christi  
P.O. Box 9277  
Corpus Christi, Texas 78469-9277  
Phone: 880-3527  
Fax: 880-3501

**To:** ALL PLAN HOLDERS

**Date:** January 6, 2005

**From:** Ángel R. Escobar, P.E.  
Director of Engineering Services

**Pages:** 2 (including fax sheet)

**Subject:** Any Old Project  
Project No. 1234  
Addendum No. 1

**Comments:** This fax transmission includes the signed, sealed addendum from XYZ Engineering Inc. for the above named project.

\*\*\*\*\*Sample Format\*\*\*\*\*

**Addendum No. 1**

January 6, 2005

TO: ALL PROSPECTIVE BIDDERS

PROJECT: Any Old Project  
Project No. 1234

Prospective bidders are hereby notified of the following modifications to the contract documents. These modifications shall become a part of the contract documents. All provisions of the contract documents not specifically affected by the Addenda shall remain unchanged.

**I. DRAWINGS**

**A. SHEET 2 OF 5, GENERAL NOTES & ESTIMATED QUANTITIES  
SUMMARY – GENERAL NOTES**

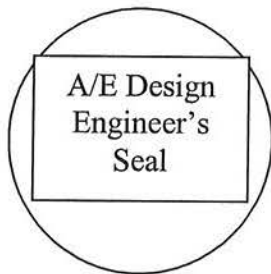
**ADD: 14. The “construction access area” shown on Sheet 2 of the plans shall be enclosed with orange safety fence to separate the construction area from the remainder of the public park. The length of this fencing is approximately 1,000 linear feet and will be maintained by the Contractor through out the duration of the project. No separate payment will be made for the safety fence.**

**B. SHEET 4 OF 5, DRAINAGE CHANNEL (PLAN & PROFILE) STA. 27+50  
TO 30+76**

**ADD: General Notes: 1. Bench Mark (Elevation 11.10) is located on the top of curb of the upstream side and on the centerline of the existing six (6) box culverts of the Oso Parkway crossing.**

Please acknowledge receipt of this Addendum in the appropriate place in your Proposal Form.

**END OF ADDENDUM NO. 1**



John Doe, P.E.  
XYZ Engineering

**ADDENDUM NO. 1  
PAGE 1 OF 1**

**ADDENDUM NO. 1**

January 6, 2005

**TO:** ALL PROSPECTIVE BIDDERS

**SUBJECT:** Any Old Project  
PROJECT NO. 1234

---

Prospective bidders are hereby notified of the following modifications to the contract documents. These modifications shall become a part of the contract documents. All provisions of the contract documents not specifically affected by the Addenda shall remain unchanged.

**I. PART A – SPECIAL PROVISIONS – PARAGRAPH A-1, TIME AND PLACE OF RECEIVING PROPOSALS / PRE-BID MEETING AND NOTICE TO BIDDERS**

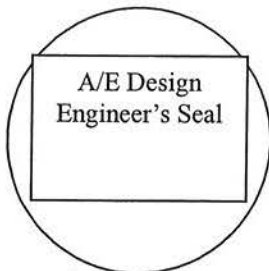
**BID DATE CHANGE**

Prospective Bidders are hereby advised that the scheduled Bid Opening date has been postponed one (1) week, from June 2, 2004 at 2:00 p.m., to Wednesday, June 9, 2004 at 2:00 p.m.

**Location and Time of Bidding shall remain unchanged.**

**Please acknowledge receipt of this addendum in the appropriate place in your PROPOSAL FORM.**

**END OF ADDENDUM #1**



John Doe, P.E.  
XYZ Engineering, Inc.

**ADDENDUM NO. 1  
PAGE 1 OF 1**



City of  
Corpus  
Christi

ADDENDUM NO. 2

June 25, 2004

TO: ALL PROSPECTIVE BIDDERS

SUBJECT: MARINA BOATERS FACILITY - LAWRENCE ST. T-HEAD  
PROJECT NO. 4315

Prospective bidders are hereby notified of the following modifications to the contract documents. These modifications shall become a part of the contract documents. All provisions of the contract documents not specifically affected by the Addenda shall remain unchanged.

I. PART S - SPECIAL PROVISIONS

PARAGRAPH A-21 PROJECT SIGNS (NOT USED)

ADD: Strike through item A-21, in its entirety. This item shall not be used.

II. PART T - TECHNICAL SPECIFICATIONS AND TABLE OF CONTENTS

SECTION 09900 - PAINTING

ADD: This new, 4-page Section (see Attachment No. 1), as included with this Addendum.

III. DRAWINGS

SHEET 6 OF 17, FINISH SCHEDULE

ADD: At Room 111 WOMEN, add an asterisk (\*) at the two Ceramic Tile (CT) finished wall surfaces and asterisk note in the Remarks column, same as shown for Room 104 MEN. Interior elevations for WOMEN 111 shall be similar to those shown for MEN 104, except Toilet Partition front with door occurs at the left Water Closet stall in WOMEN 111.

Please acknowledge receipt of this addendum in the appropriate place in your PROPOSAL FORM.

END OF ADDENDUM NO. 2



*Angel R. Escobar*  
Angel R. Escobar, P.E.  
Director of Engineering Services

ARE/rs

6/25/04

Attachment: No. 1 - Specification Section 09900 - Painting (4 pages)



City of  
Corpus  
Christi

ADDENDUM No. 1

July 23, 2004

TO: ALL PROSPECTIVE BIDDERS

PROJECT: GREENWOOD WASTEWATER TREATMENT PLANT DIGESTER COVERS REPLACEMENT,  
PROJECT NO: 7255

Prospective bidders are hereby notified of the following modifications to the contract documents. These modifications shall become a part of the contract documents. The provisions of the contract documents not specifically affected by the addendum shall remain unchanged.

**I. PART T- TECHNICAL SPECIFICATIONS**

**A. SECTION 01010, General Construction Requirements, Paragraph 1.02 WORKMANSHIP**

1. ADD: New item D. Welders' Workmanship and in reference to Section 050200, Welding; The City reserves the rights to evaluate the qualifications of the welders.

1. CONTRACTOR will be required to furnish fully qualified and certified welders, or welding operators, to follow the CONTRACTOR'S standard welding qualification procedures, and to comply with all applicable parts of Section 8, WELDING, of the AWWA Standard D100-96 and applicable parts of Section IX, of the ASME Code in regard to welder's qualification, joint design, joint preparation, joint fit-up, welding sequence, weld testing, and any other aspect of the shop or field welding.

2. CONTRACTOR shall furnish copies of all Welder Qualification Certificates to the ENGINEER prior to start of field work.

3. The CITY'S Welding Inspector may, at any time, require any welder to demonstrate and prove his ability to perform satisfactory welds in all positions.

2. ADD: New item E. Qualifications of Contractor's Workers

1. All field supervisors and craftsmen assigned to do any work on these repairs must be fully qualified in the field of work assigned to each worker.

2. The ENGINEER reserves the right to require burners, chippers, grinders, layout men, welders, ironworkers, pipe fitters, electricians and other craftsmen to either demonstrate or furnish written certification from an agency recognized by the ENGINEER of their ability to do first class work.

**B. SECTION 01010, General Construction Requirements**

**ADD:** New paragraph 1.34 RADIOGRAPHIC INSPECTION

The Contractor shall arrange for radiographic inspection of at least two butt welding joints, one for each digester cover. The inspection shall be done by a certified inspector. Due to criticality, safety, consequence of failure, the inspection will be done at random and of the welded area selected by the ENGINEER or his representative. The contractor shall figure the cost of radiographic inspection and testing of the welded butt joints in his Base Bid and will be considered subsidiary to other work.

**C. SECTION 0099030, Protective Coating of Steel, Paragraph 2.0 SURFACE PREPARATION, 2.01 NEW SURFACE.**

**ADD:** New item B. Apply 40 MILS DFT Protective Coating to the External and Internal surfaces of the Digester Covers. Between the plates and trusses of the Primary Digester Cover, apply 40 MILS DFT.

**D. SECTION 130010, Sludge Mixing System, Paragraph 2.1 APPROVED MANUFACTURERS**

**DELETE:** Mixing System shall be Rotamix as manufactured by Vaughan Co., Inc with Chopper Pumps manufactured by Vaughn Co., Inc. or approved Equal.

**ADD:** The following, in lieu thereof: Mixing System shall be Rotamix as manufactured by Vaughan Co., Inc with Chopper Pumps manufactured by Vaughn Co., Inc. or Jet Mix Vortex Mixing System manufactured by Liquid Dynamics with Chopper Pumps manufactured by Hayward Gordon Ltd.

**E. SECTION 130020, Floating Primary Digester Cover, Paragraph 1.0 GENERAL , Item B.**

**DELETE:** Supplier: The manufacturers approved for supply of digester equipment are WesTech, Envirex, and Eimco.

**ADD:** The following, in lieu thereof: Supplier: The manufacturers approved for supply of digester equipment are WesTech, Envirex, Eimco and Envirodyne Systems Inc.

**F. SECTION 130030, Beam Supported Gasholder Secondary Digester Cover, Paragraph 1.0 GENERAL, Item B.**

**DELETE:** Supplier: The manufacturers approved for supply of digester equipment are WesTech, Envirex, and Eimco.

**ADD:** The following, in lieu thereof: Supplier: The manufacturers approved for supply of digester equipment are WesTech, Envirex, Eimco and Envirodyne Systems Inc.

**G. SECTION 130040, Cleaning of Two Anaerobic Digesters, Paragraph 2.0 SCOPE OF WORK**

**ADD:** The following, at the end of the paragraph: Sludge draw off line from the two digesters is connected to a set of pumps which pump sludge to the Belt Filter Presses. Also, a belt driven centrifugal pump with variable speed drive provides an option of pumping sludge to the drying beds. The Contractor can use the pump to pump sludge to the drying beds but the pump will only be operated by the Plant Operators. The sludge inside the bottom cone shall be pumped out by the contractor using his own equipment. The Contractor, if he chooses, can hook up his own pump to the existing force main to the drying beds. The Contractor shall restore all piping and equipment so modified to its pre-existing state, once the task is completed and shall coordinate with Wastewater Dept. staff, as required.

III. DRAWINGS

A. Sheet 4 of 18 – MECHANICAL PLAN AND SECTION

ADD: The following boxed note:

All bolts & nuts and washers used inside the pump house and the digesters for the mixing system piping and the future heat exchanger shall be Stainless Steel 304.

B. Sheet 6 of 18 – DIGESTER SECTION & DETAILS

CLARIFICATION: The Corbel Detail has changed. The width of corbel will be 15” instead of 12” & NOTES are provided, for your information and use.

1. DELETE: Detail D/4/6, in its entirety.  
ADD: The REVISED Detail D/4/6 (see Attachment No. 1).
2. DELETE: Detail E/4/6, in its entirety.  
ADD: The REVISED Detail E/4/6 (see Attachment No. 2).
3. ADD: New NOTES (see Attachment No. 3).

Please acknowledge receipt of this addendum in the appropriate place on your proposal form.

END OF ADDENDUM NO. 1



Ángel R. Escobar, P. E.  
Director of Engineering Services

ARE/rs

Attachments: No. 1, REVISED Detail D/4/6  
No. 2, REVISED Detail E/4/6  
No. 3, NOTES



7/23/04



City of  
Corpus  
Christi

**ADDENDUM NO. 2**

July 8, 2003

TO: ALL PROSPECTIVE BIDDERS  
PROJECT: LAGUNA SHORES ROAD IMPROVEMENTS  
MEDITERRANEAN DRIVE TO CARIBBEAN DRIVE  
PROJECT NO. 6158

Prospective bidders are hereby notified of the following modifications to the contract documents. These modifications shall become a part of the contract documents. The provisions of the contract documents not specifically affected by the addendum shall remain unchanged.

**I. PART S – STANDARD SPECIFICATIONS AND TABLE OF CONTENTS**

**A. NEW, STANDARD SPECIFICATION SECTION 025805—ABBREVIATED PAVEMENT MARKINGS**

ADD: New Specification Section 025805 (see Attachment No. 1A).

**B. NEW, STANDARD SPECIFICATION SECTION 025807—PAVEMENT MARKINGS PAINT AND THERMOPLASTIC**

ADD: New Specification Section 025807 (see Attachment No. 1B).

**C. NEW, STANDARD SPECIFICATION SECTION 025813—PREFORMED STRIPING AND EMBLEMS**

ADD: New Specification Section 025813 (see Attachment No. 1C).

**D. NEW, STANDARD SPECIFICATION SECTION 025816—RAISED PAVEMENT MARKERS AND TRAFFIC BUTTONS**

ADD: New Specification Section 025816 (see Attachment No. 1D).

**E. NEW, STANDARD SPECIFICATION SECTION 025818—PAVEMENT MARKERS (REFLECTORIZED) (TXDOT D-9-4200)**

ADD: New Specification Section 025818 (see Attachment No. 1E).

**F. NEW, STANDARD SPECIFICATION SECTION 025820—TRAFFIC BUTTONS (TXDOT D-9-4300)**

ADD: New Specification Section 025820 (see Attachment No. 1F).

**G. NEW, STANDARD SPECIFICATION SECTION 025828—BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS (TXDOT D-9-6130)**

ADD: New Specification Section 025828 (see Attachment No. 1G).

**II. PART T – TECHNICAL SPECIFICATIONS AND TABLE OF CONTENTS**

**A. NEW, TECHNICAL SPECIFICATION SECTION 025809—THERMOPLASTIC STRIPING (TXDOT D-9-8220)**

ADD: New Specification Section 025809 (see Attachment No. 2).

**ADDENDUM NO. 2**

Page 1 of 2



III. **DRAWINGS**

A. **SHEET 15 OF 34, OFFSITE FORCEMAIN RIVIERA LIFT STATION TO STATION 4 +50 AND RIVIERA LIFT STATION DETAILS**

1. **Plan – Existing Riviera Lift Station**

**DELETE:** The following note, in it's entirety:  
EXISTING PUMPS – FLYGHT CP 3127, 6" DISCHARGE, 10HP (3 EA.). FOR FLOW RATE, SEE ABOVE CENTER. REMOVE THESE THREE PUMPS AND REPLACE WITH THREE EACH NEW FLYGHT CP 3152 20 HP PUMPS, 432 IMPELLERS, 8" DISCHARGES. TURN EXISTING PUMPS AND ALL REMOVED HARDWARE OVER TO THE CITY.

**ADD:** The following note, in lieu thereof:  
EXISTING PUMPS – FLYGHT CP 3127, 6" DISCHARGE, 10HP (3 EA.). FOR FLOW RATE, SEE ABOVE CENTER. REMOVE THESE THREE PUMPS AND REPLACE WITH THREE EACH NEW FLYGHT CP 3153 18 HP PUMPS, 433 IMPELLERS, 8" DISCHARGES, 1750 RPM. TURN EXISTING PUMPS AND ALL REMOVED HARDWARE OVER TO THE CITY.

B. **SHEETS B-1 THROUGH B-14, BRIDGE PLANS**

**ADD:** New sheets B-1 through B-14 (see Attachment No. 3).

C. **SHEET S-1, STRIPING PLAN FOR PAVEMENT**

**ADD:** New sheet S-1 (see Attachment No. 4).

D. **SHEETS T-1 THROUGH T-14, TRAFFIC CONTROL PLANS**

**ADD:** New sheets T-1 through T-14 (see Attachment No. 5).

Please acknowledge receipt of this addendum in the appropriate place in your PROPOSAL FORM.

**END OF ADDENDUM #2**



*Angel R. Escobar*  
Angel R. Escobar, P. E.  
Director of Engineering Services

ARE/rs

Attachments:

- 7/8/03
- No. 1A, NEW, STANDARD SPECIFICATION SECTION 025805—ABBREVIATED PAVEMENT MARKINGS
  - No. 1B, NEW, STANDARD SPECIFICATION SECTION 025807—PAVEMENT MARKINGS PAINT AND THERMOPLASTIC
  - No. 1C, NEW, STANDARD SPECIFICATION SECTION 025813—PREFORMED STRIPING AND EMBLEMS
  - No. 1D, NEW, STANDARD SPECIFICATION SECTION 025816—RAISED PAVEMENT MARKERS AND TRAFFIC BUTTONS
  - No. 1E, NEW, STANDARD SPECIFICATION SECTION 025818—PAVEMENT MARKERS (REFLECTORIZED) (TXDOT D-9-4200)
  - No. 1F, NEW, STANDARD SPECIFICATION SECTION 025820—TRAFFIC BUTTONS (TXDOT D-9-4300)
  - No. 1G, NEW, STANDARD SPECIFICATION SECTION 025828—BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS (TXDOT D-9-6130)
  - No. 2, NEW, TECHNICAL SPECIFICATION SECTION 025809—THERMOPLASTIC STRIPING (TXDOT D-9-8220)
  - No. 3, SHEETS B-1 THROUGH B-14, BRIDGE PLANS
  - No. 4, SHEET S-1, STRIPING PLAN FOR PAVEMENT
  - No. 5, SHEETS T-1 THROUGH T-14, TRAFFIC CONTROL PLANS



City of  
Corpus  
Christi

**ADDENDUM NO. 2**

June 7, 2004

TO: ALL PROSPECTIVE BIDDERS

PROJECT: RE-BID RIVER PUMP STATION  
RAW WATER PUMP NO. 10 MOTOR REPAIRS  
Project No. 8498

---

Prospective bidders are hereby notified of the following modifications to the contract documents. These modifications shall become a part of the contract documents. All provisions of the contract documents not specifically affected by the Addenda shall remain unchanged.

**1. PART T – TECHNICAL SPECIFICATIONS**  
**TECHNICAL SPECIFICATION T-1 - REPAIR MOTOR UNIT**

A. T-1-2 Applicable Specifications

3.

**ADD:** Repair Shop will obtain all required information for repair from Motor Manufacturer if not included in the attached "Instruction Manual" pages in Technical Exhibit T-3A.

B. T-1-4 Warranty

**DELETE:** The existing first paragraph, in its entirety.

**ADD:** The Contractor shall provide written warranty for **one (1) full year** from the date of acceptance by the City. **The warranty will cover the entire pump unit assembly.**

C. T-1-9 Reconditioning of Motors

18.

**DELETE:** The existing sentence.

**ADD:** **The motors oil reservoir shall be filled to the manufacturers specifications using oil meeting the requirements shown in the TECO Manual (see Technical Exhibit T-3A Equipment List). Before using Mobil DTE 797 oil, the Contractor shall verify that it is suitable.**

D. T-1-9 Reconditioning of Motors  
19.

**DELETE:** The existing sentence, in its entirety.

**ADD:** The motors grease reservoir(s) shall be filled to the manufacturers specifications using Shell Alvonic Grease R-3 or an equivalent. Before using Mobil Mobilx EPI Grease, the Contractor shall verify that it is suitable.

**2. QUESTIONS AND ANSWERS FROM PRE-BID**

*Q1. Will the Contractor be able to use the overhead crane?*

**A1. The contractor may use the building overhead cranes after training on the controls and hazards and obtaining the approval of the O.N SWTP Foreman. The City does not warrant the crane capacity.**

**Please acknowledge receipt of this Addendum in the appropriate place in your Proposal Form.**

**END OF ADDENDUM NO. 2**



6/7/04

*Angel R Escobar*  
\_\_\_\_\_  
Angel Escobar, P.E.  
Director of Engr. Services

**ADDENDUM**  
**SAMPLE**



City of  
Corpus  
Christi

September 16, 1999

**ADDENDUM NO. 2**

TO: ALL PROSPECTIVE BIDDERS

PROJECT: STAPLES STREET PUMPING PLANT-NEW PUMPING PLANT AND STORAGE RESERVOIR (CONTRACT 3 - PUMP STATION AND SITE WORK)  
(Project No. 8227)

Prospective bidders are hereby notified of the following modifications to the contract documents. These modifications shall become a part of the contract documents. The provisions of the contract documents not specifically affected by the addendum will remain unchanged.

1. **SECTION A- SPECIAL PROVISIONS: (Page 1 of 21) A-1 Time and Place of Receiving Proposals/Pre-Bid Meeting and Notice to Bidders**

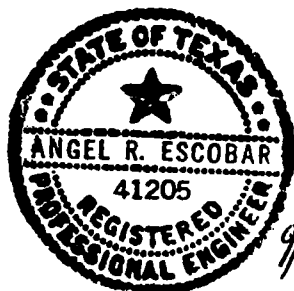
Prospective Bidders are hereby advised that the scheduled bid opening date for the above-referenced project has been postponed from **Wednesday, September 22, 1999 TO Wednesday, September 29, 1999**. Location and time of bidding shall remain unchanged.

★ Addendum No. 3 to follow shortly

**Please acknowledge receipt of this addendum in the appropriate place in your proposal form.**

End of Addendum No. 2

ARE:mgb



*Angel R. Escobar*  
Angel R. Escobar, P.E.  
Director of Engineering Services

9/16/99



City of  
Corpus  
Christi

October 2, 2000

ADDENDUM NO. 1

TO: ALL PROSPECTIVE BIDDERS

SUBJECT: 2000-2001 WASTEWATER CLEAN-OUT  
INSTALLTION PROGRAM  
( PROJECT NO. 7193 )

---

1. **SECTION T-1 - TECHINCAL SPECIFICATIONS FOR INSTALLATION OF  
WASTEWATER CLEAN-OUT**

**GENERAL REQUIREMENTS Page 1 of 7**

DELETE: the following paragraph in its entirety

- C. The City will provide the Contractor with a list of locations where clean-outs are to be installed. The list will have approximately twenty-five locations however no more than tweny are expected to be inspected and completed each week. The additional five are to insure the Contractor has 20 locations each week. The list will be provided to the contractor weekly on a specified day mutually agreed upon by the City and the Contractor. The City will attempt to provide work sites in close proximity to one other.

ADD: the following paragraph

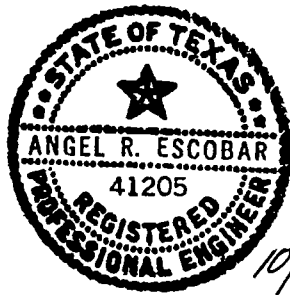
- C. The City will provide the Contractor with a list of locations where clean-outs are to be installed. The list will have approximately twenty-five locations, however, **no more than twenty-five (25) installations are to be authorized and completed each week.** The list will be

ADDENDUM NO. 1  
Page 1 of 2

provided to the contractor weekly on a specified day mutually agreed upon by the City and the Contractor. The City will attempt to provide work sites in close proximity to one other.

**END OF ADDENDUM NO. 1**

**Please acknowledge receipt of this addendum in the appropriate place in your proposal form.**



*Angel R. Escobar*  
Angel R. Escobar, P.E.  
Director of Engineering Services

*10/2/00*



City of  
Corpus  
Christi

June 25, 1999

ADDENDUM NO. 1

TO: ALL PROSPECTIVE BIDDERS

SUBJECT: **WATER DISTRIBUTION SYSTEM:  
REMOTE WATER QUALITY MONITORING SITES  
ONGOING INSTRUMENTATION MAINTENANCE PROGRAM  
(PROJECT NO. 8280)**

- 
1. **NOTICE TO BIDDERS and SPECIAL PROVISIONS, PARAGRAPH A-1 Time and Place of Receiving Proposals/Pre-Bid Meeting:** (Page 1 of 22)

**CLARIFICATION:**

At the pre-bid meeting on Thursday, June 24th, some sets of the bid documents were noted to have different dates for the bid deadline. Proposals for this project are due by **Wednesday, June 30, 1999 at 2:00 pm.** Proposals must be delivered or mailed as described in Paragraph A-1 of the Special Provisions of the bid documents.

2. **PROJECT START DATE**

**CLARIFICATION:**

This contract is being bid now because of the availability of funds, however the one-year period of maintenance coverage will not begin until approximately six months after award of the contract. This is to allow time for renovation of the nine water quality monitoring systems located at fire stations to be completed. Any significant change in the anticipated cost of the work or in the scope of the work that occurs during this six-month period will be grounds for re-negotiation of the payments terms of this contract by the City and the contractor, with all agreed-upon revisions incorporated into a change order.



3. **PART T - TECHNICAL SPECIFICATIONS, SECTION 13309 "INSTRUMENT MAINTENANCE SERVICES - REMOTE SITES", PART 1, PARAGRAPH 1.05A**  
(Page 3)

**DELETE:**

The Contractor shall respond to all requests for Corrective Maintenance within no more than **three (3) business days** after being notified.

**ADD:**

The Contractor shall respond to all requests for Corrective Maintenance within no more than **five (5) business days** after being notified.

4. **PART T - TECHNICAL SPECIFICATIONS, SECTION 13309 "INSTRUMENT MAINTENANCE SERVICES - REMOTE SITES", PART 2, PARAGRAPH 2.03**  
(Page 8)

**CLARIFICATION:**

Only tools purchased or built specifically for work on City equipment **that cannot be used on any other equipment** (for example, a piece of bar stock cut to a certain length for use in making a particular measurement consistently) are covered by this paragraph. Calibrators and communications devices that have general use for all instruments of a particular type or model from a given manufacturer would have to be provided by the Contractor if needed to perform the work covered by this contract, but would remain the property of the Contractor at the end of the contract.

5. **PART T - TECHNICAL SPECIFICATIONS, SECTION 13309 "INSTRUMENT MAINTENANCE SERVICES - REMOTE SITES", PART 3, PARAGRAPH 3.04**  
(Page 9)

**DELETE:**

**3.04 ADDING ADDITIONAL INSTRUMENTATION AND ANALYZERS TO THIS CONTRACT**

If the City desires to add additional water quality monitoring instruments or analyzers to this contract, this addition shall be accomplished using the City's normal Change Order procedure for contracts.

**ADD:**

**3.04 ADDING OR DELETING INSTRUMENTATION AND ANALYZERS TO OR FROM THIS CONTRACT**

If the City desires to add additional water quality monitoring instruments or analyzers to this contract or to delete instruments or analyzers from this contract, this addition or deletion shall be accomplished using the City's normal Change Order procedure for contracts.

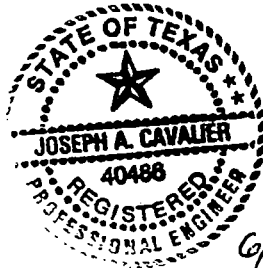
**6. PROPOSAL FORM:**

**DELETE:** Proposal in its entirety.

**ADD:** The attached REVISED Proposal as **ATTACHMENT NO. 1**

The Proposal Form has been revised to separate the three (3) water quality monitoring stations along the Lake Texana pipeline from the other water quality monitoring stations.

**Please acknowledge receipt of this addendum in the appropriate place in your proposal form.**



*for Joseph A. Cavalier*  
Angel R. Escobar, P.E.  
Acting Director of Engineering Services

6/25/99

Attachments:

Attachment 1 - Revised Proposal Form (Page 10 of 10)

P R O P O S A L F O R M  
F O R

**WATER DISTRIBUTION SYSTEM  
REMOTE WATER QUALITY MONITORING SITES  
ONGOING INSTRUMENTATION MAINTENANCE PROGRAM**

DEPARTMENT OF ENGINEERING SERVICES

CITY OF CORPUS CHRISTI, TEXAS

P R O P O S A L

Place:

Date: \_\_\_\_\_

Proposal of \_\_\_\_\_,  
a Corporation organized and existing under the laws of  
the State of \_\_\_\_\_.

OR

a Partnership or Individual doing business as  
\_\_\_\_\_  
\_\_\_\_\_.

TO: The City of Corpus Christi, Texas

Gentlemen:

The undersigned hereby proposes to furnish all labor and materials, tools, and necessary equipment, and to perform the work required for:

WATER DISTRIBUTION SYSTEM

REMOTE WATER QUALITY MONITORING SITES

ONGOING INSTRUMENTATION MAINTENANCE PROGRAM

at the locations set out by the plans and specifications and in strict accordance with the contract documents for the following prices, to-wit:

WATER DISTRIBUTION SYSTEM  
 REMOTE WATER QUALITY MONITORING SITES  
 ONGOING INSTRUMENTATION MAINTENANCE PROGRAM

Base Bid - Section 1A

All Locations Except the Three Lake Texana Pipeline Stations

I	II	III	IV	V
BID ITEM	QTY & UNIT	DESCRIPTION	UNIT PRICE IN FIGURES	BID ITEM EXTENSION (QTY X UNIT PRICE)
1	12 Month L.S.	Annual Preventive Maintenance Services of Instrumentation, Analyzers, and SCADA equipment, at locations 1 through 17 as listed in Section 13309, Part 1 Paragraph 1.01B of the Technical Specifications, complete in place per <u>Monthly Lump Sum</u>	_____	\$ _____

BASE BID - SECTION 1A: \$ \_\_\_\_\_

WATER DISTRIBUTION SYSTEM  
 REMOTE WATER QUALITY MONITORING SITES  
 ONGOING INSTRUMENTATION MAINTENANCE PROGRAM

Base Bid - Section 1B  
Three Locations on the Lake Texana Pipeline

I	II	III	IV	V
BID ITEM	QTY & UNIT	DESCRIPTION	UNIT PRICE IN FIGURES	BID ITEM EXTENSION (QTY X UNIT PRICE)
1	12 Month L.S.	Annual Preventive Maintenance Services of Instrumentation, Analyzers, and SCADA equipment, at locations 18, 19, and 20 (Palmetto Bend, Bloomington, and Woodsboro), as listed in Section 13309, Part 1 Paragraph 1.01B of the Technical Specifications, complete in place per <u>Monthly Lump Sum</u>	<hr style="width: 50%; margin-left: auto; margin-right: 0;"/>	\$ <hr style="width: 80%; margin-left: 0; margin-right: auto;"/>

BASE BID - SECTION 1B: \$ 

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**WATER DISTRIBUTION SYSTEM  
 REMOTE WATER QUALITY MONITORING SITES  
 ONGOING INSTRUMENTATION MAINTENANCE PROGRAM**

Base Bid - Section 2

I	II	III	IV	V
BID ITEM	QTY & UNIT	DESCRIPTION	UNIT PRICE IN FIGURES	BID ITEM EXTENSION (QTY x UNIT PRICE)
2A	25 HR	Corrective Maintenance Services for Instrumentation, Analyzers, and SCADA equipment - Level I, complete in place per <u>Hour</u>	_____	\$ _____
2B	100 HR	Corrective Maintenance Services for Instrumentation, Analyzers and SCADA equipment - Level II, complete in place per <u>Hour</u>	_____	\$ _____
2C	125 HR	Corrective Maintenance Services for Instrumentation, Analyzers, and SCADA equipment - Level III, complete in place per <u>Hour</u>	_____	\$ _____

BASE BID - SECTION 2 : \$ \_\_\_\_\_

BASE BID - SECTION 1A : \$ \_\_\_\_\_

BASE BID - SECTION 1B : \$ \_\_\_\_\_

TOTAL BASE BID: \$ \_\_\_\_\_

**WATER DISTRIBUTION SYSTEM  
REMOTE WATER QUALITY MONITORING SITES  
ONGOING INSTRUMENTATION MAINTENANCE PROGRAM**

Supplemental Bid Proposal  
Cost Allowance for Additional

**PREVENTIVE OR CORRECTIVE MAINTENANCE SERVICES**

The following unit prices are established for services in excess of those defined in Sections 1 and 2 of this contract:

1. **COST ALLOWANCE for additional Preventive or Corrective Maintenance Services - Level I, per Hour:**

\_\_\_\_\_ per Hour  
(unit price)

2. **COST ALLOWANCE for additional Preventive or Corrective Maintenance Services - Level II, per Hour:**

\_\_\_\_\_ per Hour  
(unit price)

3. **COST ALLOWANCE for additional Preventive or Corrective Maintenance Services - Level III, per Hour:**

\_\_\_\_\_ per Hour  
(unit price)

Any services provided under this provision of the contract must be authorized in advance by the City.



**WATER DISTRIBUTION SYSTEM  
REMOTE WATER QUALITY MONITORING SITES  
ONGOING INSTRUMENTATION MAINTENANCE PROGRAM**

**Guaranteed Minimum Payment - Section 2**

The following is established as the guaranteed minimum amount to be paid by the City to the Contractor for services covered by Section 2 of the contract. If payments under Section 2 of the contract are less than this amount at the conclusion of the contract, the difference between the actual amount paid and the minimum shall be due to the Contractor from the City.

In the case of cancellation of the contract by the City, the guaranteed minimum amount for Section 2 of the Contract shall be calculated on a pro-rated monthly amount, equal to 1/12 times the annual amount times the number of months that the Contract was in force.

**Guaranteed Annual Minimum Amount:                    \$12,000**

The undersigned hereby declares that he has visited the site and has carefully examined the plans, specifications and contract documents relating to the work covered by his bid or bids, that he agrees to do the work, and that no representations made by the City are in any sense a warranty but are mere estimates for the guidance of the Contractor.

Upon notification of award of contract, we will within ten (10) calendar days execute the formal contract and will deliver a Performance Bond (as required) for the faithful performance of this contract and a Payment Bond (as required) to insure payment for all labor and materials. The bid bond attached to this proposal, in the amount of 5% of the highest amount bid, is to become the property of the City of Corpus Christi in the event the contract and bonds are not executed within the time above set forth as liquidated damages for the delay and additional work caused thereby.

**Minority/Minority Business Enterprise Participation:** The apparent low bidder shall, within two days (five days for Contractors outside Nueces County) of receipt of bids, submit to the City Engineer, in writing, the names and addresses of MBE firms participating in the contract and a description of the work to be performed and its dollar value for bid evaluation purpose.

**Number of Signed Sets of Documents:** The contract and all bonds will be prepared in not less than four counterpart (original signed) sets.

~~Time of Completion: The undersigned agrees to complete the work within 120 calendar days from the date designated by a Work Order.~~

The undersigned further declares that he will provide all necessary tools and apparatus, do all the work and furnish all materials and do everything required to carry out the above mentioned work covered by this proposal, in strict accordance with the contract documents and the requirements pertaining thereto, for the sum or sums above set forth.

Receipt of the following addenda is acknowledged (addenda number):

Respectfully submitted:

Name: \_\_\_\_\_

By: \_\_\_\_\_

(SIGNATURE)

(SEAL - If Bidder is  
a Corporation)

Address: \_\_\_\_\_  
(P.O. Box) (Street)

(City) (State) (Zip)

Telephone: \_\_\_\_\_

**NOTE:** Do not detach bid from other papers.  
Fill in with ink and submit complete  
with attached papers.

PR (7/90)



**CITY OF CORPUS CHRISTI  
DISCLOSURE OF INTERESTS**

City of Corpus Christi Ordinance 17112, as amended, requires all persons or firms seeking to do business with the City to provide the following information. Every question must be answered. If the question is not applicable, answer with "NA".

**FIRM NAME:** \_\_\_\_\_

**STREET:** \_\_\_\_\_ **CITY:** \_\_\_\_\_ **ZIP:** \_\_\_\_\_

**FIRM is:** 1. Corporation       2. Partnership       3. Sole Owner       4. Association   
5. Other  \_\_\_\_\_

**DISCLOSURE QUESTIONS**

If additional space is necessary, please use the reverse side of this page or attach separate sheet.

**1. State the names of each "employee" of the City of Corpus Christi having an "ownership interest" constituting 3% or more of the ownership in the above named "firm".**

<b>Name</b>	<b>Job Title and City Department (if known)</b>
_____	_____
_____	_____

**2. State the names of each "official" of the City of Corpus Christi having an "ownership interest" constituting 3% or more of the ownership in the above named "firm".**

<b>Name</b>	<b>Title</b>
_____	_____
_____	_____

**3. State the names of each "board member" of the City of Corpus Christi having an "ownership interest" constituting 3% or more of the ownership in the above named "firm".**

<b>Name</b>	<b>Board, Commission or Committee</b>
_____	_____
_____	_____

**4. State the names of each employee or officer of a "consultant" for the City of Corpus Christi who worked on any matter related to the subject of this contract and has an "ownership interest" constituting 3% or more of the ownership in the above named "firm".**

<b>Name</b>	<b>Consultant</b>
_____	_____
_____	_____

**CERTIFICATE**

I certify that all information provided is true and correct as of the date of this statement, that I have not knowingly withheld disclosure of any information requested; and that supplemental statements will be promptly submitted to the City of Corpus Christi, Texas as changes occur.

**Certifying Person:** \_\_\_\_\_ **Title:** \_\_\_\_\_  
(Type or Print)

**Signature of Certifying Person:** \_\_\_\_\_ **Date:** \_\_\_\_\_

## DEFINITIONS

- a. "Board Member". A member of any board, commission or committee appointed by the City Council of the City of Corpus Christi, Texas.
- b. "Employee". Any person employed by the City of Corpus Christi, Texas, either on a full or part time basis, but not as an independent contractor.
- c. "Firm". Any entity operated for economic gain, whether professional, industrial or commercial and whether established to produce or deal with a product or service, including but not limited to, entities operated in the form of sole proprietorship, as self-employed person, partnership, corporation, joint stock company, joint venture, receivership or trust and entities which, for purposes of taxation, are treated as non-profit organizations.
- d. "Official". The Mayor, members of the City Council, City Manager, Deputy City Manager, Assistant City Managers, Department and Division Heads and Municipal Court Judges of the City of Corpus Christi, Texas.
- e. "Ownership Interest". Legal or equitable interest, whether actually or constructively held, in a firm, including when such interest is held through an agent, trust, estate or holding entity. "Constructively held" refers to holding or control established through voting trusts, proxies or special terms of venture or partnership agreements.
- f. "Consultant". Any person or firm, such as engineers and architects, hired by the City of Corpus Christi for the purpose of professional consultation and recommendation.

**PLAN EXECUTIVE**  
**SUMMARY SAMPLE**

## PLAN EXECUTIVE SUMMARY SAMPLE

The following is the 60% submission Plan Summary for Southmoreland Addition Street Improvements - Phase 3A - Lewis Street and 4A - Ramsey Street (City of Corpus Christi Project No. 6120), Hampshire Road Improvements from SH 358 to McBride Lane (City of Corpus Christi Project No. 6121) and Minor Storm Drainage Improvements along Jester Street (City of Corpus Christi Project No. 2106). Southmoreland Addition Street Improvements and Hampshire Road Improvements from SH 358 to McBride Lane are funded in part by Community Development Block Grant Funds. Minor Storm Drainage Improvements are identified for funding in the FY 1999-2000 Capital Improvement Budget Project, ID No. DR. 96004.

Southmoreland Addition Street Improvement - Phase 3A will extend Lewis Street from Richard Street to Clemmer Street to eliminate the one-block unimproved street section between two improved streets. The limits are from the existing curb and gutter on Richard Street to the existing curb and gutter on Clemmer Street. Phase 3A includes reconstructing the street with curb and gutter, sidewalks, and driveways; extending the existing storm sewer to Clemmer Street; and replacing the waterline. The proposed storm sewer is designed based on a 2-year design frequency using concrete pipe as presented in the design memorandum. The typical section is as presented in the design memorandum using geogrid reinforcement. The waterline will be replaced with 8" DR18 C-900 as presented in the design memorandum.

Southmoreland Addition Street Improvements Phase 4A will extend Ramsey Street from Norton Street to Brawner Parkway to eliminate the open ditch on the west side of Ramsey and provide on-street parking on the east side adjacent to Sam Houston Elementary school and the City Park. The limits are from Norton Street to Brawner Parkway including work at intersections to improve traffic movements. Right-of-way acquisition is required along six parcels in order to maintain a continuous 50' street right-of-way. This project includes reconstructing the street with curb and gutter, sidewalks, and driveways; upgrading the existing storm sewer; replacing the waterline; re-routing water services to four residences; and replacing the sanitary sewer service to the school. The proposed storm sewer is designed based on a 5-year design frequency using concrete pipe as presented in the design memorandum. The typical section is as presented in the design memorandum using geogrid reinforcement. The existing waterline will be replaced with 8" DR18 C-900 as presented in the design memorandum. The water service reroutes are made using 3/4" Type "K" copper. The sanitary sewer service will be made using SDR 26 PVC.

Hampshire Road Improvements from SH 358 to McBride Lane will construct a curb and gutter street section from SH 358 Frontage Road to McBride Lane. This will eliminate the existing open ditch section and improve drainage. This project include reconstructing the street with curb and gutter, sidewalks, and driveways; constructing storm sewer; replacing sanitary sewer; and replacing the waterline. The proposed storm sewer is designed based on a 5-year design frequency using concrete pipe as presented in the design memorandum. The typical section is as presented in the design memorandum using geogrid reinforcement. The waterline will be replaced with 8" DR18 C-900 as presented in the design memorandum.

Minor Storm Drainage Improvements along Jester Street consists of upgrading the existing outfall

to accommodate drainage area EB-B of the 1969 drainage study and Flour Bluff Estates, Phase 1 - Area Street Improvements storm sewer system. The limits are from Jane Street east along Jester Street for 1494 feet. The improvements include removing the existing 48" corrugated metal pipe and replacing it with a 7' x 4' concrete box culvert with sloping wingwalls. Approximately 640 feet of existing ditch will be closed in with the box culvert to eliminate erosion and bank stability problems. Right-of-way acquisition is required at the inlet of the proposed structure (5 parcels), along Jester Street to maintain 25 feet of right-of-way to the left of the centerline at unplatted parcels (3 parcels) and at the outlet of the structure to Corpus Christi Bay to provide a maintainable ditch section (1 parcel). The proposed culvert replacement/extension was designed based on a 25-year design frequency using cast-in-place concrete boxes and wingwalls giving the contractor the option to use pre-cast boxes with cast-in-place wingwalls. The existing 10" sanitary sewer cast-iron force main will be relocated to the south side of Jester Street as part of this project. The sanitary sewer force main will be relocated using 10" DR18 C-900.

Standard City of Corpus Christi details for waterlines, sanitary sewers and storm sewers will be used with special details for culverts, safety end treatments, wingwalls and grate inlets provided by Smith, Russo & Mercer.

Attached is a complete list of standard specifications and technical specifications for this project.

## PROJECT CHECKLIST

Project Name: Southmoreland Addition Street Improvements-Phase 3A & 4A  
Hampshire Road Improvements from SH 358 to McBride Lane  
Minor Storm Drainage Improvements along Jester Street

Project No.: #6120 #6121 #2106

Date: December 1, 2000

(60%) 90% ) Submittal (circle one)

Review the following checklist and respond "Yes", "No", "N/A" (not applicable):

Yes Has a Plan Executive Summary been completed and attached as per Section 6.3

Yes Has a Drawings Review Checklist been completed?

Yes Does this design reflect the project's scope of work?

Yes Will additional easements of right-of-way (ROW) be required?

Yes What permits will be required? State here: Nationwide Corps Permit (Jester)  
State here: \_\_\_\_\_  
State here: \_\_\_\_\_

N/A Have the permits been prepared and submitted to the city?

N/A Is the site platted, so that it can be built on?

No Are there special environmental issues involved?

No Is this project affected by a floodplain?

No Are there any special site requirements?

N/A Are adequate power/utilities available at/near the site?

Yes Have all the existing utilities and facilities been located and indicated on the plans?



Yes Have all the existing City-owned utilities been contacted?

Yes Wastewater

Yes Water

Yes Storm Water

Yes Gas

Yes Streets

Yes Will existing and/or future utilities and facilities have an effect on this design?

Which regulatory agencies need to review these plans?

State here: C.D.B.G.

Contacted: \_\_\_\_\_

State here: \_\_\_\_\_

Contacted: \_\_\_\_\_

State here: \_\_\_\_\_

Contacted: \_\_\_\_\_

Which private utility or service agencies need to review these plans?

Yes Southwestern Bell

Contacted: \_\_\_\_\_

Yes Central Power & Light

Contacted: \_\_\_\_\_

\_\_\_\_\_ Fiber Optics

Contacted: \_\_\_\_\_

\_\_\_\_\_ Other

Contacted: \_\_\_\_\_

\_\_\_\_\_ Other

Contacted: \_\_\_\_\_

No Any special construction sequencing required?

Yes Will existing facilities remain in service during construction?

No Any project soil disposal requirements and/or sites?

N/A Soil exploration required?

No Any materials to be salvaged and stored or delivered to City?

No Any contractor lay-down or material areas available?

Yes Any special requirements to be incorporated into the project (OSHA trench safety, traffic control, storm water pollution protection, ADA compliance, etc.)?

State here: Trench Safety

State here: Traffic Control

State here: SW3P

State here: ADA Compliance

N/A What building codes affect this project?

State here: \_\_\_\_\_

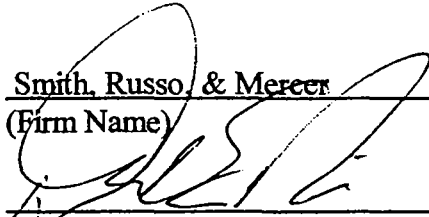
State here: \_\_\_\_\_

State here: \_\_\_\_\_

N/A Design calculations submitted? (As required and attached)

N/A Equipment information or selections submitted?

Submitted by: Smith, Russo & Mercer  
(Firm Name)



Date: 12-1-00

(Derek E. Naiser, P.E.)

Reviewed by: \_\_\_\_\_

Date: \_\_\_\_\_

(City Representative)

## DRAWINGS REVIEW CHECKLIST

Project Name: Southmoreland Addition Street Improvements-Phase 3A & 4A  
Hampshire Road Improvements from SH 358 to McBride Lane  
Minor Storm Drainage Improvements along Jester Street

Project No.: #6120      #6121      #2106

Date: December 1, 2000

( 60% 90% ) Submittal (circle one)

Review the following checklist and respond "Yes", "No", "N/A" (not applicable):

Yes Are the proposed improvements shown correctly and satisfactorily, in accordance with City of Corpus Christi Plan Preparation Standards?

Yes Are dimension and clearance interfaces between various discipline drawings correct?

N/A Have comments on previous red-lined review sheets been incorporated?

N/A Have previous red-lined review sheets been submitted with this review?

Yes Is material selection proper?

Yes Are the items **constructible** as shown?

Yes Are dimensions included, correct, and consistent?

Yes Do drafting technique conform to the standards specified in the City of Corpus Christi Plan Preparation Standards?

Yes Are survey control monuments clearly indicated?

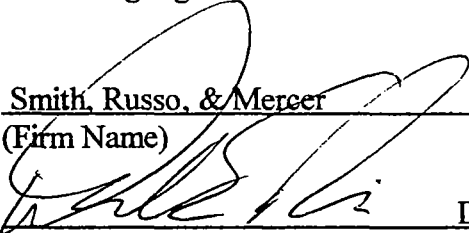
Yes Are the drawings legible, clearly delineating proposed work from existing elements?

Yes Is a title sheet provided?

Yes Do the titles and drawing numbers agree with the title sheet's index list?

N/A Are all drawings listed correctly in the contract documents?

- Yes Are the title blocks completed?
- Yes Has the appropriate person(s) approved the drawings for submittal?
- Yes Have the drawings been marked or sealed as required by law?
- Yes Do legends indicate all symbols used on drawings?
- N/A Are adequate construction and general notes used?
- Yes Are adequate and clear details used?
- Yes Are there north arrows on all plan views?
- Yes Does each drawing and detail have a scale noted?
- N/A Are bid items clearly stated?
- N/A Is there an adequate scope of work cited in paragraph A-3 of the Special Conditions, and does this match the description in the Notice to Bidders?
- N/A Are all finished floor elevations indicated clearly?
- N/A Are boring logs exhibited in the contract documents?

Submitted by: Smith, Russo, & Mercer  
(Firm Name)  
  
Date: 12-1-00  
(Derek E. Naiser, P.E.)

Reviewed by: \_\_\_\_\_ Date: \_\_\_\_\_  
(City Representative)

**SOUTHMORELAND ADDITION STREET IMPROVEMENTS- PHASE 3A & 4A (PROJ #6120)  
HAMPSHIRE ROAD IMPROVEMENTS (PROJ #6121)  
MINOR STORM DRAINAGE IMPROVEMENTS ALONG JESTER STREET (PROJ #2106)**

**STANDARD SPECIFICATIONS TO BE USED**

**020 SITE ASSESSMENTS & CONTROLS**

020200 Field Office

**021 SITE PREPARATION**

021010 Project Signs (Includes 2 Diagrams)  
021020 Site Clearing & Stripping S5  
021080 Removing Abandoned Structures S55

**022 EARTHWORK**

022020 Excavation & Backfill for Utilities & Sewers S9  
022022 Trench Safety for Excavations  
022040 Street Excavation S10  
022060 Channel Excavation S11  
022080 Embankment S13  
022100 Select Material S15  
022420 Silt Fence S97

**025 ROADWAY**

**0252.....SUBGRADES AND BASES**

025205 Pavement Repair, Curb, Gutter, Sdk, Dwy, Replacement  
025222 Flexible Base High Strength S24A

**0254.....ASPHALTS AND SURFACES**

025402 Planing Asphalt Surfaces S27A  
025404 Asphalts, Oils, & Emulsions S29  
025412 Prime Coat S30  
025414 Aggregate for Surface Treatment & Seals S35  
025418 Surface Treatment S32  
025424 Hot Mix Asphalt Concrete Pavement S34

**0256.....CONCRETE WORK**

025608 Inlets S63  
025610 Concrete Curb & Gutter S52  
025612 Concrete Sidewalks & Driveways S53  
025614 Concrete Curb Ramps

**0258.....TRAFFIC CONTROLS & DEVICES**

025802 Temporary Traffic Controls During Construction  
025807 Pavement Markings (Painted on Thermoplastic) S45



**GENERAL ABBREVIATION INDEX**

L	ANGLE	PI	POINT OF INTERSECTION
⊙	AT	R OR P.L.	PROPERTY LINE
%	PERCENT	PP	POWER POLE
AC	ASBESTOS CEMENT	PROP	PROPOSED OR PROPERTY
ADD.	ADDENDUM	PRV	PRESSURE REDUCING VALVE
ALT	ALTERNATE	PSI	POUNDS/SQUARE INCH
ANSI	AMERICAN NATIONAL STANDARD INSTITUTE	PVMT	PAVEMENT
AP	ASPHALT PAVEMENT		
APPROX	APPROXIMATE	REINF	REINFORCING
ASTM	AMERICAN SOCIETY FOR TESTING & MATERIALS	REQ'D	REQUIRED
AVG	AVERAGE	REV	REVISE, REVISION
AWWA	AMERICAN WATER WORKS ASSOCIATION	R.O.W. OR ROW	RIGHT OF WAY
		RT	RIGHT
BL	BASELINE	S	SOUTH, SIGN, SLOPE
BC	BEGINNING OF CURVE	SAN	SANITARY
BLDG	BUILDING	SCH	SCHEDULE
BLVD	BOULEVARD	SECT	SECTION
BM	BENCH MARK	SD	STORM DRAIN
		SDR	STANDARD DIMENSION RATIO
C/C	CENTER TO CENTER	SF	SQUARE FEET
CI	CAST IRON	S.H.	STATE HIGHWAY
⊕	CENTERLINE	SHT	SHEET
CMP	CORRUGATED METAL PIPE	SLV	SLEEVE
CO	CLEANOUT	SMH	STORMWATER MANHOLE
CONC	CONCRETE	SPEC	SPECIFICATION
CONSTR	CONSTRUCTION	SS	SANITARY SEWER
CONT	CONTINUOUS	STA	STATION
		STD	STANDARD
DEG	DEGREE	STL	STEEL
DEMO	DEMOLITION	ST	STREET OR STORM
DET	DETAIL	SURF	SURFACE
DI	DUCTILE IRON	SW	SIDEWALK
DIA OR ⌀	DIAMETER	SWPPP	STORMWATER POLLUTION PREVENTION PLAN
DIM	DIMENSION		
DIST	DISTANCE	TB	TRAFFIC BOX
DR	DIMENSION RATIO	TC	TOP OF CURB
DRWG	DRAWING	T.C.E.	TEMPORARY CONSTRUCTION EASEMENT
		TEL	TELEPHONE
E	EAST	TEMP	TEMPORARY
EA	EACH	TL	TRAFFIC LIGHT
EB	ELECTRIC BOX	TR	TELEPHONE RISER
EC	END OF CURVE	TYP	TYPICAL
ELEC	ELECTRIC		
EL, ELEV	ELEVATION	U.E.	UTILITY EASEMENT
EOC	EDGE OF CURB	UG/CABLE	UNDERGROUND CABLE
ENGR	ENGINEER	UTIL	UTILITY
ES	ELECTRIC STANDARD		
EST	ESTIMATE	VERT	VERTICAL
EXC	EXCAVATED	VF	VERTICAL FOOT
EXIST	EXISTING		
EW	EACH WAY		
		W	WATER
FCP	FENCE CORNER POST	WM	WATER METER
FH	FIRE HYDRANT	WV	WATER VALVE
FL	FLOW LINE	W/O	WITHOUT
FM	FORCE MAIN		
F.M.	FARM TO MARKET		
FOC	FIBER OPTIC CABLE		
FT	FEET, FOOT		
G	GAS		
GAS	GAS WARNING SIGN		
GM	GAS METER		
GP	GUARD POST		
GW	GUY WIRE		
HORZ	HORIZONTAL		
HV	HIGH VOLTAGE		
HWY	HIGHWAY		
ID	INSIDE DIAMETER		
I.H.	INTERSTATE HIGHWAY		
INV	INVERT		
L	LEFT		
LF	LINEAR FEET		
LP	LIGHT POLE		
MH	MANHOLE		
MISC	MISCELLANEOUS		
N	NORTH		
NC	NATURAL GROUND		
NO	NUMBER		
NTS	NOT TO SCALE		
OC	ON CENTER		
OD	OUTSIDE DIAMETER		
OH,OHE	OVERHEAD, OVERHEAD ELECTRIC LINE		

**PIPE MATERIAL INDEX**

ACP	ASBESTOS CEMENT PIPE
CMP	CORRUGATED METAL PIPE
DIP	DUCTILE IRON PIPE
PVC	POLYVINYL CHLORIDE PIPE
RCP	REINFORCED CONCRETE PIPE
VCP	VITRIFIED CLAY PIPE

**QUANTITIES**

Line	Item #	Item	QUANTITY	UNIT
A	1	Standard (6' depth or less) 6" Dia. Fiberglass Manhole	16	EA
	2	Standard 6" Dia. Fiberglass Drop Manhole	3	EA
	3	92" Dia. Manhole (20'-22' Deep)	2	EA
	4	Extra Depth for 6" Dia. Manholes	190	VF
	5	30" AWWA C-905 DR 25 (165 PSI) PVC Pipe (8'-10' Deep)	750	LF
	6	30" AWWA C-905 DR 25 (165 PSI) PVC Pipe (10'-12' Deep)	900	LF
	7	30" AWWA C-905 DR 25 (165 PSI) PVC Pipe (12'-14' Deep)	1950	LF
	8	30" AWWA C-905 DR 25 (165 PSI) PVC Pipe (14'-16' Deep)	800	LF
	9	30" AWWA C-905 DR 25 (165 PSI) PVC Pipe (16'-18' Deep)	2100	LF
	10	30" AWWA C-905 DR 25 (165 PSI) PVC Pipe (18'-20' Deep)	1400	LF
	11	30" AWWA C-905 DR 25 (165 PSI) PVC Pipe (20'-22' Deep)	1480	LF
	12	54" HOBAS Pipe (20'-22' Deep)	30	LF
	13	Bore and Jack 42" Dia. Steel Casing	258	LF
	14	Open Cut Install 42" Dia. Steel Casing	399	LF
	15	30"x30"x12" Wye	1	EA
	16	30"x30"x16" Wye	2	EA
	17	12" C900 DR 18 Class 150 PVC Pipe (4'-8' Deep)	9	LF
	18	16" C905 DR 18 (235 PSI) PVC Pipe (4'-8' Deep)	32	LF
	19	Trench Excavation Protection	9421	LF
B	1	Standard (6' depth or less) 4" Dia. Fiberglass Manhole	2	EA
	2	Extra Depth for 4" Dia. Manholes	14	VF
	3	8" SDR 26 Class 160 PVC Pipe (12'-14' Deep)	850	LF
	4	6" Standard House Connection	5	EA
	5	Trench Excavation Protection	850	LF
C	1	Standard (6' depth or less) 4" Dia. Fiberglass Manhole	2	EA
	2	Extra Depth for 4" Dia. Manholes	12	VF
	4	8" SDR 26 Class 160 PVC Pipe (12'-14' Deep)	450	LF
	5	6" Standard House Connection	3	EA
	6	Trench Excavation Protection	450	LF
	D	1	Standard (6' depth or less) 4" Dia. Fiberglass Manhole	5
2		Extra Depth for 4" Dia. Manholes	30	VF
3		12" SDR 26 Class 160 PVC Pipe (12'-14' Deep)	1400	LF
4		Bore and Jack 20" Dia. Steel Casing	150	LF
5		Trench Excavation Protection	1260	LF

**GENERAL NOTES**

**60% SUBMITTAL**

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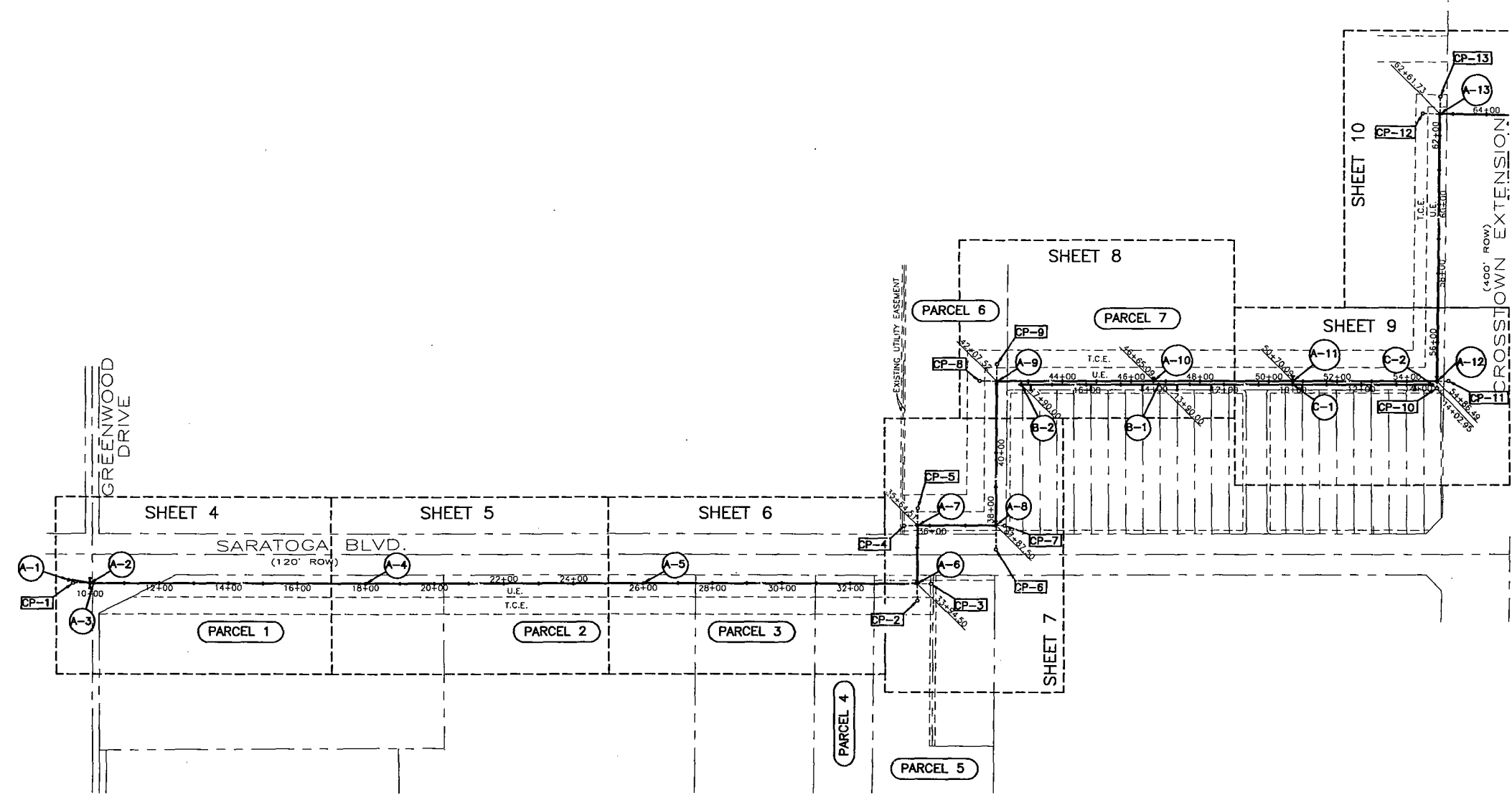
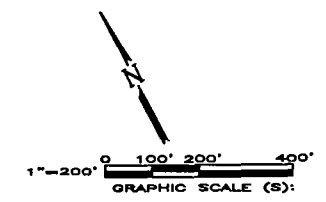
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**CITY of CORPUS CHRISTI**  
TEXAS  
Department of Engineering Services



**30" GRAVITY SEWER LINE  
GREENWOOD DRIVE TO  
RICHTER DITCH**  
**ESTIMATED QUANTITIES,  
ABBREVIATIONS AND  
GENERAL NOTES**

THIS DOCUMENT IS RELEASED FOR REVIEW UNDER THE AUTHORITY OF **STEVE STONOVITZ** P.E. # **82426**. ON THIS NOT TO BE USED FOR ANY OTHER PURPOSE.



**LEGEND:**

- A-20 MANHOLE DESIGNATION
- CP-15 CONTROL POINT DESIGNATION
- 30+00  $\epsilon$  STATIONING OF PIPE
- PROP. GRAVITY SEWER
- - - RIGHT OF WAY LINE/ PARCEL PROPERTY LINE
- - - CENTERLINE OF STREET
- - - EASEMENT LINE
- - - SHEET BOUNDARY
- U.E. UTILITY EASEMENT
- T.C.E. TEMPORARY CONSTRUCTION EASEMENT
- 1" IRON PIPE

**60% SUBMITTAL**

NOTE:  
THE PURPOSE OF THIS SHEET IS TO SHOW MANHOLES, CONTROL POINT COORDINATES, AND SHEET LAYOUT/ORIENTATION. EXISTING UTILITIES, EASEMENTS, RIGHT-OF-WAY LINES, ETC., ARE SHOWN IN DETAIL ON PLAN SHEETS 4-17.

NOTE:  
UTILITY EASEMENTS AND TEMPORARY CONSTRUCTION EASEMENTS ARE SHOWN IN DETAIL ON PLAN SHEETS.

PARCEL NO.	OWNER NAME
1	SOUTH TEXAS RAINBOW LIMITED PARTNERSHIP
2	SIL-VAL, INC.
3	GARDENDALE INVESTMENT CORPORATION
4	GARDENDALE INVESTMENT CORPORATION
5	GARDENDALE INVESTMENT CORPORATION
6	HOWARD E. ADAMS & DANIEL E. ADAMS
7	CARDCO, INC.

MANHOLES				
PT	NORTHING	EASTING	STATION	DESCRIPTION
A-1	17152070.90	1322091.85	9+36.21	MANHOLE
A-2	17152027.16	1322152.23	10+00.00	MANHOLE
A-3	17151654.92	1322848.03	10+10.87	MANHOLE
A-4	17152032.30	1322142.63	18+00.00	MANHOLE
A-5	17151277.55	1323553.43	26+00.00	MANHOLE
A-6	17150902.77	1324253.98	33+94.50	MANHOLE
A-7	17151051.94	1324335.54	35+64.51	MANHOLE
A-8	17150946.75	1324532.17	37+87.50	MANHOLE
A-9	17151315.28	1324733.66	42+07.52	MANHOLE
A-10	17151099.43	1325137.12	46+65.09	MANHOLE
A-11	17150908.39	1325494.23	50+70.09	MANHOLE
A-12	17150711.97	1325861.39	54+86.49	MANHOLE
A-13	17151390.29	1326236.74	62+61.73	MANHOLE
B-1	17151083.54	1325145.64	13+90.00	MANHOLE
B-2	17151272.23	1324792.94	17+90.00	MANHOLE
C-1	17150899.58	1325489.52	10+00.00	MANHOLE
C-2	17150709.50	1325844.82	14+02.95	MANHOLE

CONTROL POINTS			
PT	NORTHING	EASTING	DESCRIPTION
CP-1	17152055.88	1322098.54	1" IRON PIPE
CP-2	17150858.68	1324230.40	1" IRON PIPE
CP-3	17150883.58	1324289.08	1" IRON PIPE
CP-4	17151070.65	1324301.32	1" IRON PIPE
CP-5	17151096.02	1324359.13	1" IRON PIPE
CP-6	17150885.02	1324499.15	1" IRON PIPE
CP-7	17150934.95	1324554.21	1" IRON PIPE
CP-8	17151339.26	1324689.79	1" IRON PIPE
CP-9	17151359.36	1324757.25	1" IRON PIPE
CP-10	17150694.33	1325851.95	1" IRON PIPE
CP-11	17150696.33	1325890.62	1" IRON PIPE
CP-12	17151414.50	1326192.99	1" IRON PIPE
CP-13	17151434.04	1326260.94	1" IRON PIPE

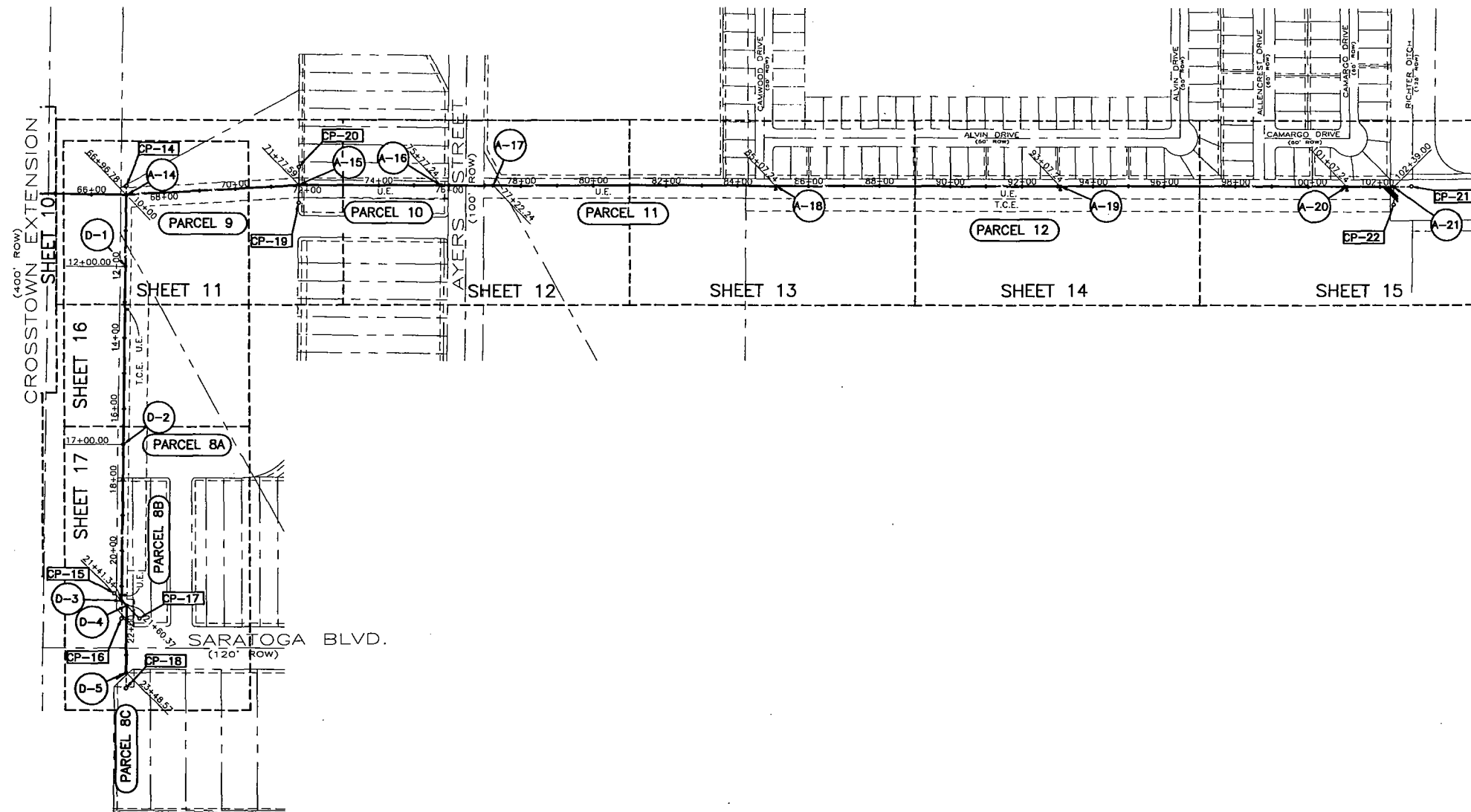
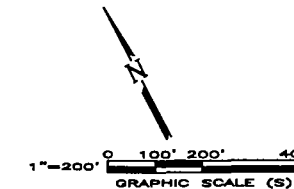
CITY of CORPUS CHRISTI  
TEXAS  
Department of Engineering Services



30" GRAVITY SEWER LINE  
GREENWOOD DRIVE TO  
RICHTER DITCH  
SHEET LAYOUT MAP  
AND CONTROL



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RELEASED FOR THE  
PURPOSE OF REVIEW  
UNDER THE AUTHORITY  
OF  
**STEVE STONOVITZ**  
P.E. # **82428**  
IT IS NOT TO BE USED  
FOR ANY OTHER  
PURPOSE.



DESIGN:					
DRAWN:					
CHECK:					
HORIZ. SCALE:	1"=200'				
REVISION NO.				DATE	BY

CITY of CORPUS CHRISTI  
TEXAS  
Department of Engineering Services



**LEGEND:**

- MANHOLE DESIGNATION
- CONTROL POINT DESIGNATION
- 30+00  $\epsilon$  STATIONING OF PIPE
- PROP. GRAVITY SEWER
- - - RIGHT OF WAY LINE/  
PARCEL PROPERTY LINE
- CENTERLINE OF STREET
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**60% SUBMITTAL**

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SHEETS 4-17.

NOTE:  
UTILITY EASEMENTS AND TEMPORARY  
CONSTRUCTION EASEMENTS ARE SHOWN  
IN DETAIL ON PLAN SHEETS.

MANHOLES				
PT	NORTHING	EASTING	STATION	DESCRIPTION
D-1	17151004.62	1326520.54	12+00.00	MANHOLE
D-2	17150567.13	1326278.46	17+00.00	MANHOLE
D-3	17150180.97	1326064.77	21+41.34	MANHOLE
D-4	17150162.71	1326070.13	21+60.37	MANHOLE
D-5	17149997.34	1325979.78	23+48.57	MANHOLE
A-14	17151179.65	1326617.39	66+96.78	MANHOLE
A-15	17150975.79	1327056.16	71+77.59	MANHOLE
A-16	17150787.06	1327408.44	75+77.24	MANHOLE
A-17	17150718.58	1327536.25	77+22.24	MANHOLE
A-18	17150347.84	1328228.19	85+07.24	MANHOLE
A-19	17149970.02	1328933.35	93+07.24	MANHOLE
A-20	17149592.21	1329638.51	101+07.24	MANHOLE
A-21	17149529.99	1329754.66	102+39.00	MANHOLE

CONTROL POINTS			
PT	NORTHING	EASTING	DESCRIPTION
CP-14	17151201.52	1326629.50	1" IRON PIPE
CP-15	17150209.46	1326056.42	1" IRON PIPE
CP-16	17150137.22	1326040.57	1" IRON PIPE
CP-17	17150114.73	1326084.21	1" IRON PIPE
CP-18	17149958.06	1325958.32	1" IRON PIPE
CP-19	17150931.73	1327032.55	1" IRON PIPE
CP-20	17151019.87	1327079.78	1" IRON PIPE
CP-21	17149506.40	1329798.74	1" IRON PIPE
CP-22	17149485.90	1329731.07	1" IRON PIPE

PARCEL NO.	OWNER NAME
8A	CARCOO, INC.
8B	GREG VOISIN INVESTMENT CORPORATION
8C	RAY THURMAN
9	CITY OF CORPUS CHRISTI
10	CITY OF CORPUS CHRISTI
11	CITY OF CORPUS CHRISTI
12	MARTHA G. SPEAR

30" GRAVITY SEWER LINE  
GREENWOOD DRIVE TO  
RICHTER DITCH  
SHEET LAYOUT MAP  
AND CONTROL

SHEET 3B of 25  
RECORD DRAWING NO.  
**SAN 508**  
CITY PROJECT # 7196



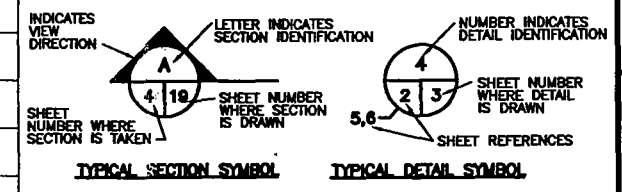
THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF REVIEW UNDER THE AUTHORITY OF **STEVE STANOVITZ** P.E. # **82428**. IT IS NOT TO BE USED FOR ANY OTHER PURPOSE.

SCALE:  
HORIZ: 1"=40'  
VERT: 1"=4'

**LEGEND:**

- EXISTING**
- EB ELECTRIC BOX
  - ES ELECTRICAL STANDARD
  - FCP FENCE CORNER POST
  - FH FIRE HYDRANT
  - GM GAS METER
  - GAS GAS WARNING SIGN
  - GCP GUARD POST
  - GW GUY WIRE
  - LP LIGHT POLE
  - PSP PEDESTRIAN SIGNAL POLE
  - PP POWER POLE
  - SS SANITARY MANHOLE
  - S SIGN
  - SMH STORM WATER MANHOLE
  - TR TELEPHONE RISER
  - TB TRAFFIC BOX
  - TL TRAFFIC LIGHT
  - TREE
  - UG/CABLE UNDERGROUND CABLE
  - WM WATER METER
  - WV WATER VALVE
- NEW**
- MATCHLINE
  - CENTER LINE (CL)
  - CURB
  - DITCH (FLOW LINE)
  - EASEMENT
  - EDGE OF PAVEMENT
  - OH ELECTRIC LINE (OVERHEAD)
  - E ELECTRIC LINE (UNDERGROUND)
  - FENCE
  - NATURAL GROUND
  - PROPERTY LINE
  - R.O.W. (RIGHT OF WAY LINE)
  - SIDEWALK

- NEW**
- B-1(25) GEOTECHNICAL BORING # AND DEPTH OF BORE
  - MANHOLE (MH)
  - FLOW DIRECTION
  - GRAVITY SEWER
  - EASEMENT LINE
  - STATION NUMBER



**NOTE:**

THE LOCATION AND DEPTH OF EXISTING UTILITIES SHOWN HEREON, ARE BASED UPON AVAILABLE PLANS, MAPS, DRAWINGS AND SPOT CHECK POTHOLES; THERE IS NO GUARANTEE THAT SAID LINES HAVE ACTUALLY BEEN CONSTRUCTED AS SHOWN. THE CONTRACTOR SHALL CONTACT ALL UTILITY LOCATORS NOTED ON THE COVER SHEET AND SHALL VERIFY BY HIS OWN FIELD EXPLORATION, THE LOCATION AND DEPTH OF ALL UTILITY LINES PRIOR TO CONSTRUCTION OF THE PROPOSED IMPROVEMENTS. ANY CONFLICTS FOUND BY SUCH EXPLORATION SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER.

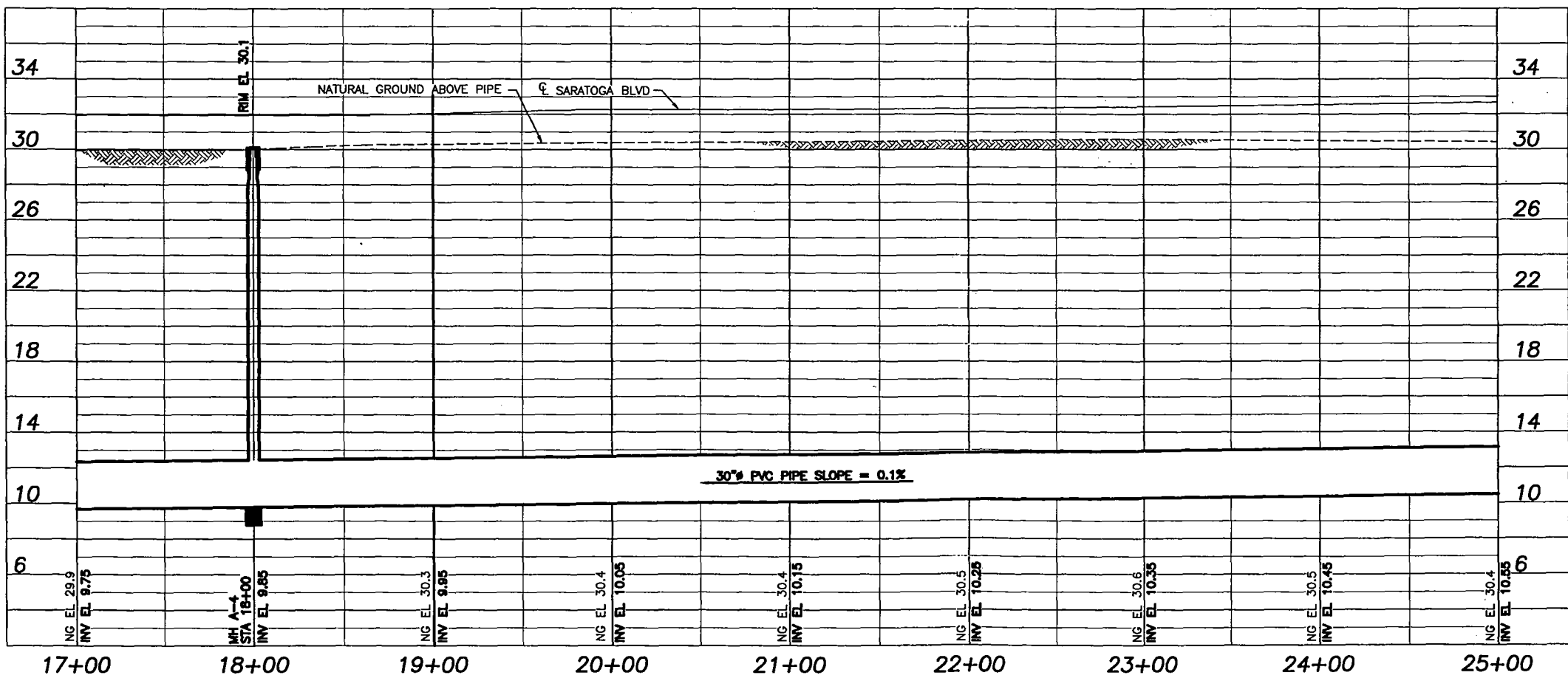
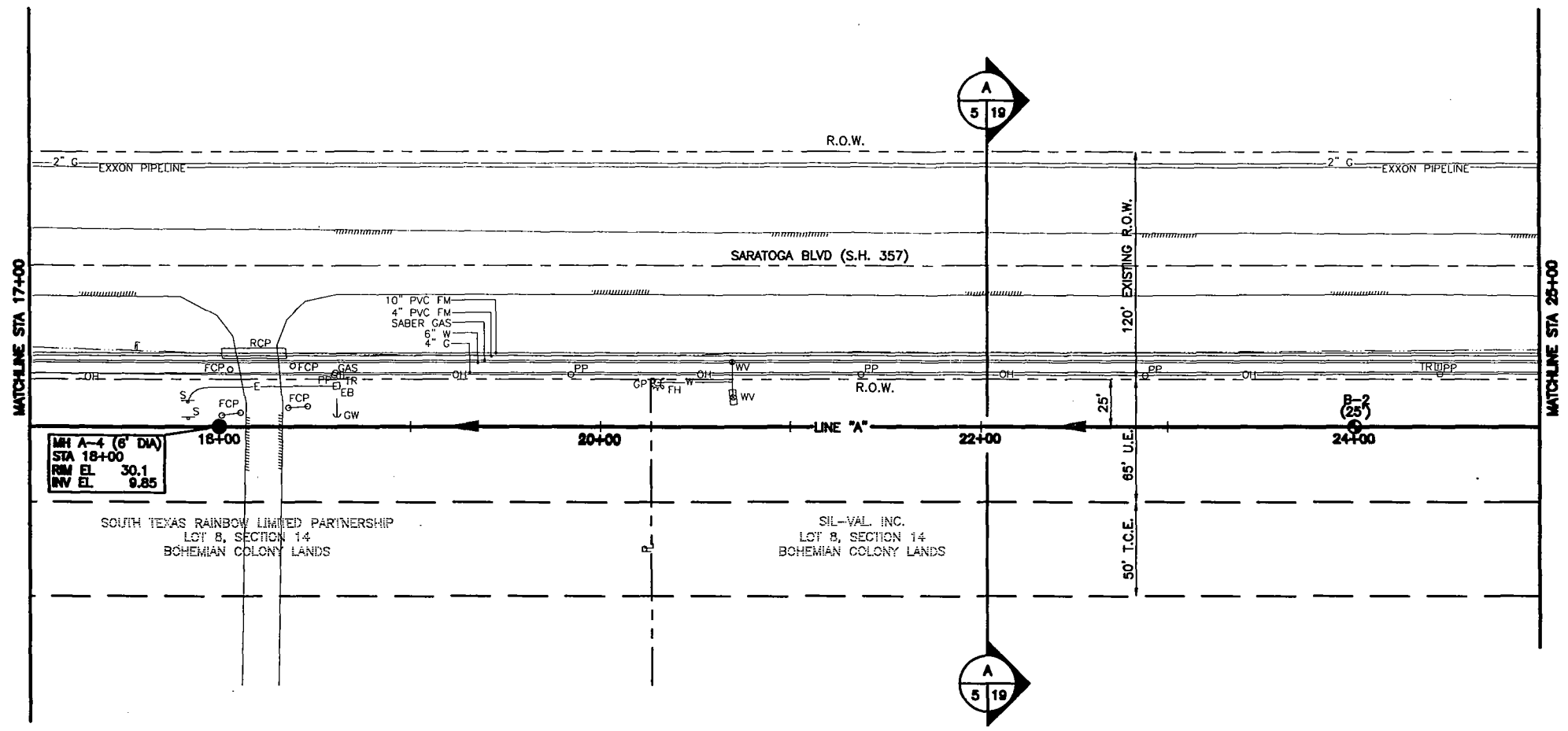
**60% SUBMITTAL**

DESIGN:	HORIZ. SCALE:	DATE:	BY:
DRAWN:	VERT. SCALE:	REVISION NO.:	
CHECKS:			

**CITY of CORPUS CHRISTI**  
TEXAS  
Department of Engineering Services

**30" GRAVITY SEWER LINE**  
**GREENWOOD DRIVE TO**  
**RICHTER DITCH**  
**30" GRAVITY SEWER**  
**STA 17+00 TO STA 25+00**

SHEET 5 of 25  
RECORD DRAWING NO.  
**SAN 508**  
CITY PROJECT # 7196



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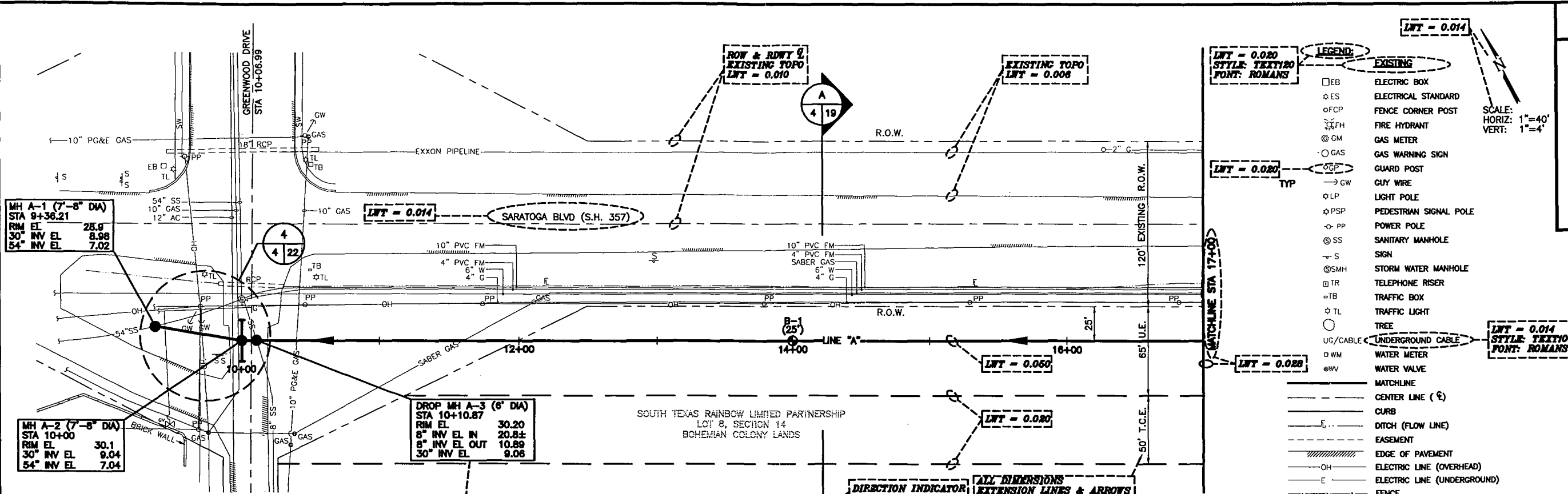
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DRAWN:	VERT. SCALE: 1"=4'	BY:
CHECK:		REVISION NO.:

CITY of CORPUS CHRISTI TEXAS  
Department of Engineering Services

30" GRAVITY SEWER LINE  
GREENWOOD DRIVE TO  
RICHTER DITCH  
30" GRAVITY SEWER  
STA 9+36.21 TO STA 17+00

SHEET 4 of 25  
RECORD DRAWING NO. SAN 508  
CITY PROJECT # 7196

J:\CADD CORP\ject Drawings\98047-04 Greenwood to Richter Ditch\dwg\citysheet4.dwg  
01/04/01 9:36



**LEGEND:**

**EXISTING**

- EB ELECTRIC BOX
- ⊙ ES ELECTRICAL STANDARD
- ⊙ FCP FENCE CORNER POST
- ⊙ FH FIRE HYDRANT
- ⊙ GM GAS METER
- ⊙ GAS GAS WARNING SIGN
- ⊙ GP GUARD POST
- ⊙ GW GUY WIRE
- ⊙ LP LIGHT POLE
- ⊙ PSP PEDESTRIAN SIGNAL POLE
- ⊙ PP POWER POLE
- ⊙ SS SANITARY MANHOLE
- ⊙ S SIGN
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- ⊙ TB TRAFFIC BOX
- ⊙ TL TRAFFIC LIGHT
- TREE
- ⊙ UC/CABLE UNDERGROUND CABLE
- ⊙ WM WATER METER
- ⊙ WV WATER VALVE

**NEW**

- MATCHLINE
- CENTER LINE (C)
- CURB
- DITCH (FLOW LINE)
- EASEMENT
- EDGE OF PAVEMENT
- OH ELECTRIC LINE (OVERHEAD)
- E ELECTRIC LINE (UNDERGROUND)
- FENCE
- NATURAL GROUND
- PROPERTY LINE
- R.O.W. (RIGHT OF WAY LINE)
- SIDEWALK

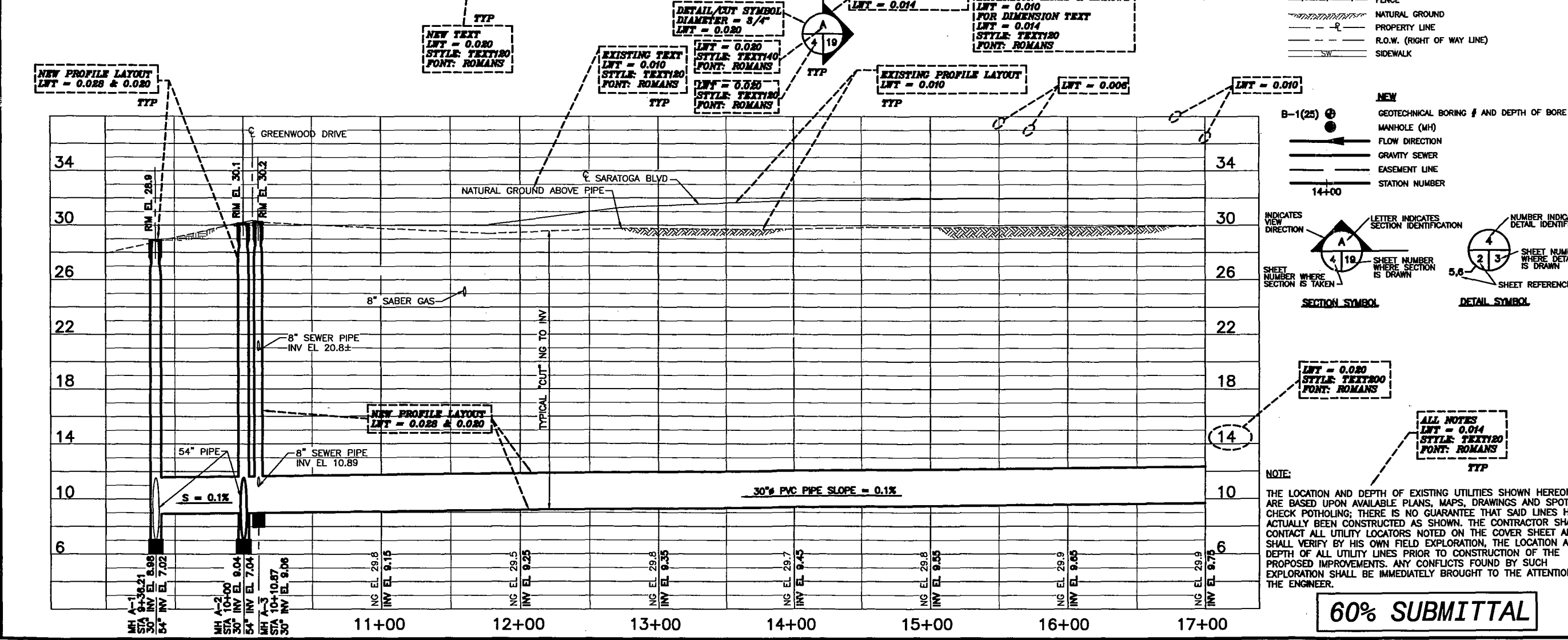
**NEW**

- B-1(25) GEOTECHNICAL BORING # AND DEPTH OF BORE
- ⊙ MANHOLE (MH)
- FLOW DIRECTION
- GRAVITY SEWER
- EASEMENT LINE
- STATION NUMBER

**SECTION SYMBOL:** A 4 19

**DETAIL SYMBOL:** 4 2 3

**NOTE:**  
THE LOCATION AND DEPTH OF EXISTING UTILITIES SHOWN HEREON, ARE BASED UPON AVAILABLE PLANS, MAPS, DRAWINGS AND SPOT CHECK POT-HOLING; THERE IS NO GUARANTEE THAT SAID LINES HAVE ACTUALLY BEEN CONSTRUCTED AS SHOWN. THE CONTRACTOR SHALL CONTACT ALL UTILITY LOCATORS NOTED ON THE COVER SHEET AND SHALL VERIFY BY HIS OWN FIELD EXPLORATION, THE LOCATION AND DEPTH OF ALL UTILITY LINES PRIOR TO CONSTRUCTION OF THE PROPOSED IMPROVEMENTS. ANY CONFLICTS FOUND BY SUCH EXPLORATION SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER.



60% SUBMITTAL

# **Exhibit 13**

## **b. NEW Guidelines for** **Street Plan Sheets**

**(Revised December 2004)**

## GUIDELINES FOR STREET PLAN SHEETS

### Title Sheet

CDBG funded projects are required to have specific text on the Title Sheet, **Exhibit A.**

### Project Location/General Notes/Summary of Quantities Sheet(s)

#### 1. Benchmarks

Label on each plan and profile sheet; if not located on the specific sheet then use closest benchmark.

Use structures or surface improvements that will not be disturbed during construction as benchmarks.

Include Summary of Benchmarks on Project Location Map.

#### 2. Testing Schedule during construction shall include types, frequency and estimated number of each test to test materials and meet quality control.

**Exhibit B.**

#### 3. Location map

Show benchmarks using same ID as on Summary of Benchmarks.

Include Summary of Boring Locations

Show Soil Boring Locations and label ID of each consistent with that used on Summary of Boring Locations

#### 4. Street Project Layout Sheet

Shade limits of street with proposed improvements; label street segment with applicable sheet number for easy reference. **Exhibit C.**

The contents of this sheet may be combined with existing storm water base map.

#### 5. Base Maps

Storm Water Base Map showing existing and proposed storm sewer system. **Exhibit D.**

Water Base Map showing existing and proposed water lines.

Wastewater Base Map showing existing and proposed wastewater lines.

Gas Base Map showing existing gas lines.

#### 6. Legend

Include Legend and show meaning of all symbols used in plans that are consistent on all sheets. **Exhibit E.**

## 7. Base Line Map

Include a Baseline Map showing the intersecting streets with equations between baselines. **Exhibit F.**

## 8. Cross Section of Pavement Section

The Engineer shall show a Typical Section for each different pavement section used. **Exhibit G.** The Section shall include:

1. Thickness and type of each pavement section layer
2. Specify compaction requirements
3. Specify amount of lime either by lbs per sy or % by weight based on Eads and Grimms lab test

Base Material under curb is required to be minimum of 4-inches thick.

### **Exhibit H.**

Use of salvaged pavement materials is not required; use is optional and is left to Engineer's judgment. Use of salvaged pavement materials requires contractor to provide for additional handling and meet temporary storage requirements. Use of salvaged material is subject to testing requirements dependent upon application of material in pavement design.

## 9. General Notes

Include any items not included in Special Provisions of Contract, or Standard Specifications.

Clarify any Special Details or Special provisions or payment of items of work fences, sprinkler systems, etc. **Exhibit I.**

## 10. Estimated Summary Table of Quantities

The Estimated Summary Table of Quantities shall be completed by street with a total for all streets. Use Bid Items description and #'s consistent with Proposal in Contract Documents. Identify Base Bid and Additive Alternate items. Use the units for the respective bid items identified in **Exhibit J.**

Include allowance for each water, wastewater and storm water pay item category to allow for unforeseen adjustments during construction. Allow for \$5,000 to \$20,000 depending on size of project.

## 11. Bid Items

The Engineer shall arrange the bid items in the categories listed below. In some cases the categories may be dictated by differing funding sources. Each category shall have a subtotal:

1. Street
2. Storm Water
3. Water
4. Wastewater
5. Gas
6. Pavement Markings
7. Traffic Signs
8. Traffic Signals

The Engineer shall "increase" the appropriate estimated quantities of particular bid items to cover any potential quantity overruns due to unanticipated field changes or requests by property owners and authorized by the City.

## 12. Design Considerations

- a. Engineer shall closely examine the possible need for low retaining walls behind sidewalk. Maximum acceptable slope from proposed back-of-walk elevation to property line is 3:1. A low retaining wall shall be considered when permanent structures or trees fall within this area.
- b. Engineer shall carefully consider the location of proposed sidewalk to avoid removal of trees and provide adequate clearance from structures that cannot be relocated. Gradual transitions in sidewalk alignment shall be used consistent with ADA requirements.
- c. Engineer shall carefully consider top-of-curb and sidewalk elevations to avoid excess excavation which would unduly damage tree root structures and result in death of tree. It is recommended that existing top-of-curb elevations be matched as closely as possible, but maintain a gutter grade of 0.30% as a minimum.
- d. The Engineer shall use the standard residential street width of 28 foot back-to-back width for residential streets. However, if the existing street is less than the 28 foot back-to-curb, then it must be determined if tree damage will be sustained by widening to the standard. Tree damage shall be kept to a minimum by modifying the width of the street.
- e. The street design shall not use valley gutters.
- f. Pavement Design shall be based on AASHTO guidelines and geo-technical investigation report by an accredited laboratory. The



City will contract separately with a laboratory using the scope of investigation established by the Engineer. The Traffic Engineering Office will provide the current and project traffic count data.

g. Engineer shall prepare the Traffic Control Plan (TCP) for use on all phases of construction.

h. Engineer shall submit plans to Texas Department of Licensing Regulation (TDLR) for review and obtain approval prior to approval of plans and contract documents by the Director of Engineering Services.

### **Street Plan and Profile Sheets**

1. Show proposed street and drainage improvements separately from proposed utilities.
2. The Plan and Profile Sheets shall have all proposed curb & gutter, sidewalks, driveways, storm and sanitary sewers shaded to insure clarity of the proposed work.
3. The line weights of utility lines should reflect the relative size of the line.
4. The preferred scale is 1":20 ft ; however, 1":40 ft will be considered on a case by case basis.
5. All lettering on plans shall be large and legible. Do not crowd information together. It is preferred that leaders be used to put lettering into clear, uncluttered areas. Use font size on all sheets that will allow half size reductions, for microfilming, from 24" x 36" to 11" x 17" with adequate legibility
6. Orient NORTH arrow to the top of sheet or within a northeast quadrant.
7. Baseline shall typically be centerline of right-of-way. Curved alignments may dictate use of construction baselines.
8. Label legal description, property ownership and length of frontage for each parcel. **Exhibit K.**
9. Show proposed minimum driveway widths in compliance with Driveway Ordinance.
10. The Engineer shall show all existing utilities in both the plan and profile view. If the elevations of the existing utilities are unknown, then the profile view can be omitted, unless it is critical to an element of the construction.

11. Show all existing topographic surface and underground elements within project limits and sections of street immediately contiguous to project limits.

12. Stationing shall begin at 1+00 as a minimum and shall extend from left to right of sheet. Do not use negative stationing.

13. Survey data collection is not limited to right of way width. Show closest edge of structure, concrete slabs, walkways, house, porch, trees, fences, gates, brick fence posts, garages, sprinklers, etc. in private property.

**Exhibit L.**

14. Extend proposed driveways to Right of Way line. Show driveway transition areas and allow 10% slope on transition. The transition distances on sidewalks shall meet Texas Accessibility Standards (TAS) requirements. Include transition quantities in the appropriate bid item.

15. Proposed street improvements include pavement, driveways, curb and gutter, sidewalks and curb ramps.

16. Show existing elevations at Right of Way Line Right, Left and at Centerline every 50 foot intervals.

17. Show proposed elevations for Top of Curb Right and Left. Label slope on profile at 50 foot intervals and at grade breaks.

18. Show proposed elevations for centerline when design criteria dictate, i.e., higher design speeds or widths are not symmetrical or top of curb elevation is not the same on each side.

19. Show and label existing driveway, elevation, material composition of driveway, widths and length, width of sidewalk runners on plan and profile.

20. Show proposed driveways and sidewalk runners on plan and profile. Do not label station numbers for proposed driveways if existing driveway is being replaced. Use station numbers at center of proposed driveway only if new driveway is being provided.

21. Show grade break with STA # and longitudinal slope on top of curb.

22. Include summary of elements to be removed/abandoned per sheet.

23. Label end of radius (EOR) station and elevation (at TOC) at point of tangency and curvature at intersections. Label length of radius.

**Exhibit M.**

- 24.Overlap pavement at point of project limits. Sawcut asphalt and overlap the asphalt and base material to top of subgrade in stair step manner.
- 25.Dimension transition lengths at locations of horizontal change at junction with existing unimproved pavement sections.
- 26.Transition lengths at locations of vertical change shall not exceed a maximum algebraic difference of 4%.
- 27.Specify removal of pipes or other elements to be abandoned within one (1') foot of finished subgrade elevation.
- 28.Abandon pipe in place by plugging or by filling with grout. Design engineer shall determine which is appropriate. Generally pressure pipe over 12" shall be filled with grout unless trapped air due to vertical alignment is a problem. Gravity pipe shall be filled with grout if over 8".

#### **Utilities Plan and Profile Sheets**

- 1.Engineer shall coordinate with the City's Water and Wastewater Divisions in the design kickoff meeting to insure that any new and/or relocated utilities are included in the project.
- 2.The Engineer is required to obtain field confirmations of utility top of pipe or flowlines that are critical to setting elevations to avoid conflict. The assumption of flowlines based on old construction plans is not acceptable. The use of exploratory construction excavation may be considered as a bid item if elevation information cannot be obtained otherwise and is critical to design.
- 3.Engineer shall review the adopted utility master plans to ensure new trunk lines or upgrades to existing included in scope.
- 4.Show all existing topographic surface and underground elements within project limits and sections of street immediately contiguous to project limits that provide information to contractor.
- 5.Proposed utility improvements include: storm water, water, and wastewater and may include gas lines.
- 6.Label station where alignment of utility lines change.
- 7.Label distance from base line where alignment is parallel.

## Waterlines

1. Waterline is to be paid as waterline but contractor is required to provide ductile iron pipe segments at vertical and horizontal offset locations.
2. Show location of service lines where water meters are known and located.
3. Include a Water Valve and Fitting Location Detail.

### **Exhibit N.**

## Storm Water

1. Label longitudinal slope, length and type of pipe used for storm sewer in profile.
2. Storm sewer base map will show existing system and proposed system.
3. Storm Sewer Lateral Sheet will show cross section of all laterals connections to collection line or inlet or manhole/junction box. Show detail of storm sewer laterals at inlets, junction boxes and manholes. Label elevations. Show existing and proposed utilities within each storm sewer lateral cross section. **Exhibit O.**
4. Review inlet spacing and inlet capacity to justify frequency and need for inlet extension or wider inlet and to reduce the degree of ponding width on street.
5. Drainage Area Boundary Map will define area draining to trunk line that serves as outfall for the proposed storm sewer improvements within project limits, define subareas draining to inlets, and subareas draining to proposed storm sewer line within limits of project scope.
6. Use storm water precast or cast-in-place concrete boxes (4' x 4") in lieu of storm water brick cylindrical manholes as general rule.
7. Review size of storm water junction box or manhole where 3 to four RCP pipes are connected.
8. Label top of rim casting, flowlines of manholes, flowlines of intersection pipes into junction box.
9. Show size, material, length of pipe and slope for each homogeneous section.

10. Label width of inlet if pipes greater than 18-inches I.D. are connected to the side of inlet.

11. Allow 6-inch distance between ID of box and OD of connecting pipe.

12. Show use of concrete pipe collar when connection is made between existing and new pipe where junction box is not used. Specify size, width, thickness, reinforcement where collar is used.

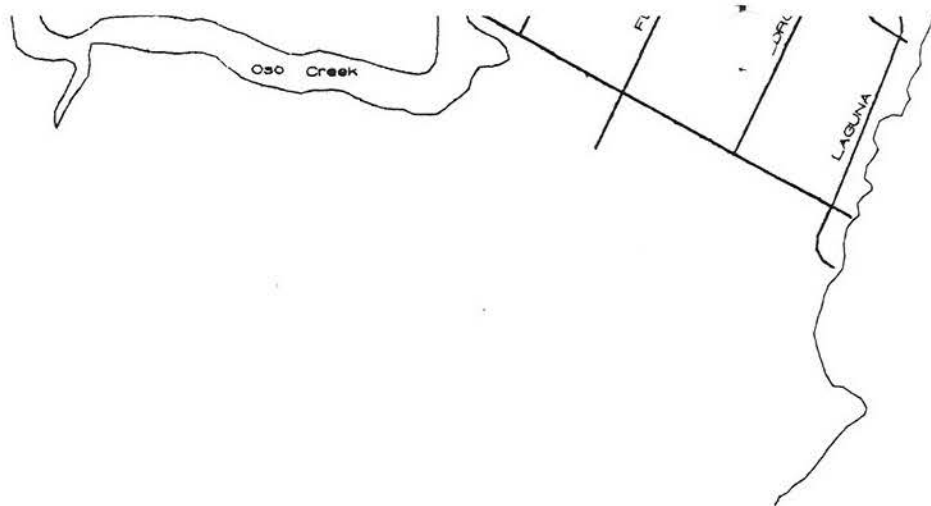
13. Label hydraulic grade line on profile sheet.

#### Wastewater

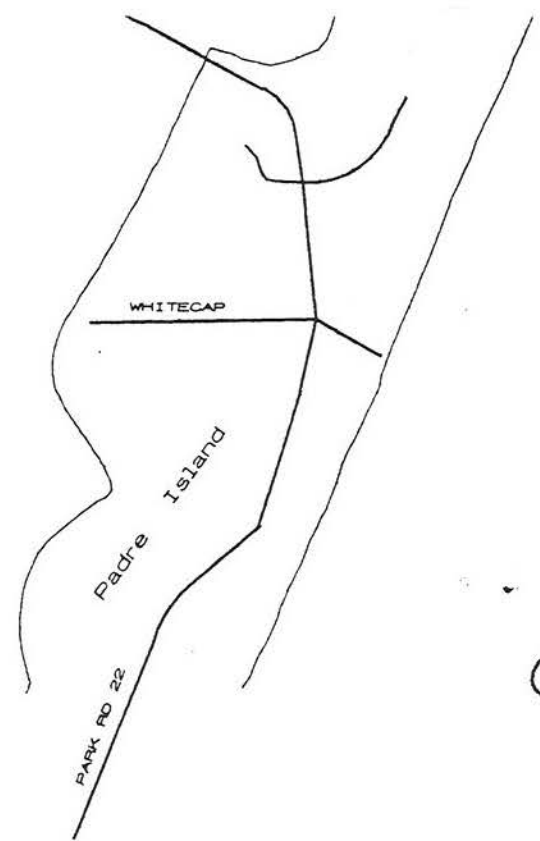
1. Show slope, size of pipe, length of homogeneous segment and cut depth of trench.

2. Label flow lines and direction (N, S, E, or W) at junction boxes/manholes at connecting or exiting pipes.

3. In case of re-routes of private sanitary sewer lines within lots, identify the lots affected. **Exhibit P.** Trenching adjacent to residential concrete slabs are recommended to use a special detail, **Exhibit Q.**



LAGUNA



GULF

GUIDELINES FOR STREET PLAN SHEETS

EXHIBIT 13B

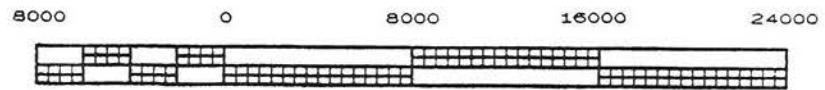
Page 9 of 25

New Document: Dec. 2004

THIS PROJECT IS FUNDED THROUGH THE COMMUNITY DEVELOPMENT BLOCK GRANT FY 1997. PARTICIPATION IN THIS PROJECT WILL REQUIRE COMPLIANCE WITH FEDERAL REGULATIONS. THE FEDERAL WAGE RATES AND GUIDELINES ARE INCORPORATED IN PART C OF THE CONTRACT DOCUMENTS AND SUPERCEDE ANY SECTION OF THE CONTRACT IN CONFLICT THEREWITH.

EXHIBIT A

GRAPHIC SCALE



SUBMITTED:

APPROVED:

TESTING SCHEDULE

DESCRIPTION:	Rate:	Quantities:
<b>SOILS:</b>		
Atterberg Limits - raw subgrade	Per Street	9
pH - raw subgrade	Per Street	9
Standard Proctor - raw subgrade	Per Street	9
pH - limed subgrade	Per Street	9
Standard Proctor - limed subgrade	Per Street	9
Standard Proctor - trench backfill	Per Material	9
Densities - raw subgrade	Per 100 LF Street	10
Densities - limed subgrade	Per 100 LF Street	55
Densities - trench backfill	Per 500 LF Pipe	50
Densities - driveways	Per 5 Driveways	15
<b>FLEXIBLE BASE CALICHE:</b>		
Atterberg Limits - raw	Per 3,000 CY	2
Sieve Analysis - raw	(or material change)	2
pH - raw	"	2
L. A. Abrasion - raw	"	2
Atterberg Limits - limed	"	2
pH - limed	"	2
Modified Proctor - limed	"	2
Densities of compacted base - limed	Per 100 LF Street	60
<b>MIXTURE OF SALVAGED SURFACE &amp; BASE COURSES:</b>		
Sieve Analysis - limed & mixed	Per 300 LF Street	40
pH - limed & mixed	Per 300 LF Street	40
Modified Proctor - limed & mixed	Per Material Change	15
Densities of compacted reworked base	Per 100 LF Street	60
<b>HOT MIX ASPHALT CONCRETE (HMAC):</b>		
Extraction, Sieve Analysis	Per 500 tons or day	9
Lab Density & Stability	Per 500 tons or day	9
Theoretical Density (Rice Method)	Per 500 tons or day	9
Temperature - during lay-down	continuous	
Thickness - in place	Per 300 LF Street	40
% Air Voids - in place	Per 300 LF Street	40
% Theoretical Density - in place	Per 300 LF Street	40
<b>CONCRETE:</b>		
(Unconfined Compression, 7, 14, & 28 day)		
Curb & Gutter	Per 1000 LF C&G	20
Sidewalk	Per 4000 SF	20
Driveway	Per 2500 SF	10
Curb Inlet	Per 10 Inlets	6

Note: The Engineer may require additional testing as he deems necessary.

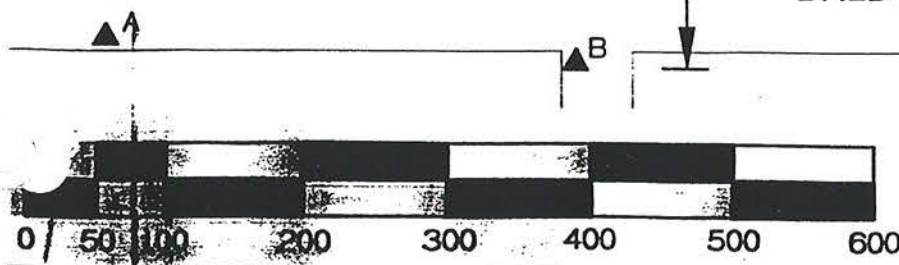
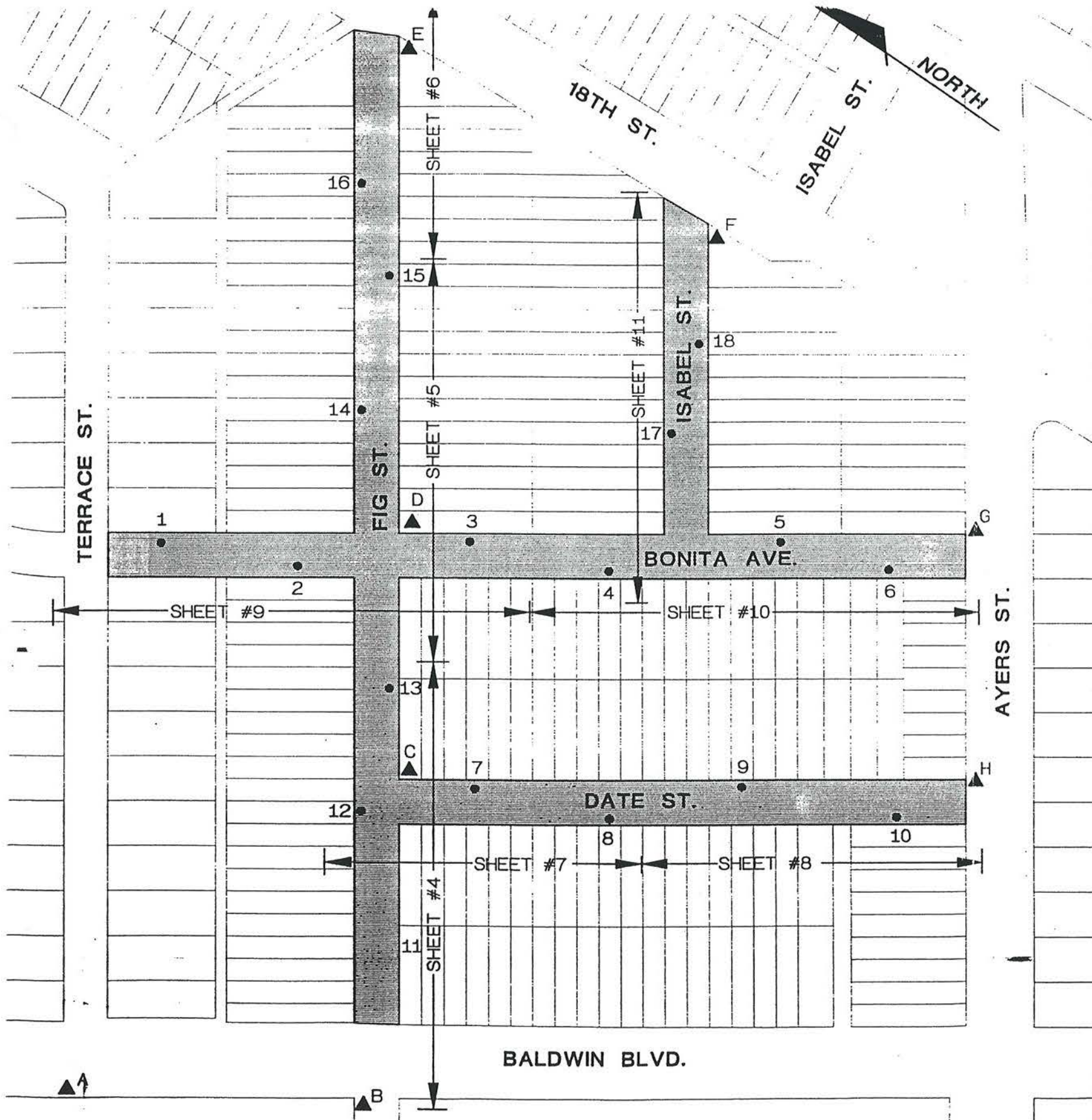
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





EXHIBIT B

GUIDELINES FOR STREET PLAN SHEETS  
EXHIBIT 13B  
Page 10 of 25  
New Document: Dec. 2004

NVS



LEGEND	
▲ A	BENCH MARK LOCATION
● 1	BORING HOLE LOCATION

▲ A	34.91	CHISEL MARK  TOP OF INLET N.W. CORNER TERRACE AND BALDWIN
▲ B	33.73	CHISEL MARK  TOP OF INLET N.W. CORNER BALDWIN AND FIG
▲ C	35.40	B.M. 60d NAIL IN POWER POLE S.E. CORNER DATE AND FIG
▲ D	35.56	B.M. 60d NAIL IN POWER POLE S.E. CORNER BONITA AND FIG
▲ E	35.58	CHISEL MARK  TOP OF INLET S.W. CORNER FIG AND 18TH ST.
▲ F	35.12	CHISEL MARK  TOP OF INLET S.W. CORNER ISABEL AND 18TH ST.
▲ G	34.61	CHISEL MARK  TOP OF INLET N.E. CORNER AYERS AND BONITA
▲ H	34.43	CHISEL MARK  TOP OF INLET N.E. CORNER DATE AND AYERS


**BENCH MARKS**

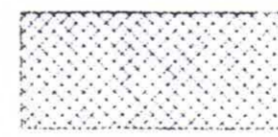
EXHIBIT C

EXHIBIT C





 BASE STREET AND STORM WATER

 ALTERNATE NO.2 STREET AND STORM WATER

# STORMWATER PROP. & EXIST. MAP

SCALE 1"=200'

LEGEND

SYMBOL TYPES

EXISTING

	STORM DRAINAGE INLET		GAS METER
	SANITARY SEWER MANHOLE		WATER METER
	STORM SEWER MANHOLE		ELECTRIC PEDASTAL
	ELECTRICAL MANHOLE		TELEPHONE PEDASTAL
	WATER VALVE		MAIL BOX
	GAS VALVE		RAILROAD SIGN
	FIRE HYDRANT		STREET SIGN
	LIGHT POLE		PARKING METER
	POWER POLE		DECIDUOUS TREE
	GUY WIRE		PALM TREE
	TRAFFIC SIGNAL		PINE TREE
	BENCH MARK		BUSH or SHRUB
	TX. HIGHWAY DEPT. MONUMENT		HEDGE or FLOWER BEDS
	4' SIDEWALK		MARSH GRASS
	CURB & GUTTER		TREE STUMP

PROPOSED

	STORM DRAINAGE INLET		WATER VALVE
	STORM MANHOLE		GAS VALVE
	SAN MANHOLE		METER
	FIRE HYDRANT		CURB & GUTTER
	4' SIDEWALK		

LINE TYPES

	CENTER LINE
	BASE LINE
	HURR. FENCE
	WOOD FENCE
	OVERHEAD LINE
	PROPERTY LINE
	PROP. SANITARY SEWER
	EXIST. SANITARY SEWER
	PROP. STORM LINE
	EXIST. STORM LINE
	PROP. WATER LINE
	EXIST. WATER LINE
	PROP. GAS LINE
	EXIST. GAS LINE
	UNDERGROUND PIPE LINE
	UNDERGROUND ELECTRIC LINE
	UNDERGROUND TELEPHONE LINE
	CENTER LINE of DITCH
	EXIST. EDGE of PAVEMENT
	EXIST. EDGE of PAVEMENT
	RAILROAD TRACKS

ABBREVIATIONS

TC	TOP OF CURB	ASPH	ASPHALT
LG	LIP OF GUTTER	HORIZ	HORIZONTAL
FH	FIRE HYDRANT	VERT	VERTICAL
PP	POWER POLE	WS	WRAPPED STEEL
TELE	TELEPHONE	DI	DUCTILE IRON
NTS	NOT TO SCALE	SAN	SANITARY SEWER
CI	CAST IRON	STO	STORM SEWER
EL & ELEV	ELEVATION	RCP	REINFORCED CONCRETE PIPE
VG	VALLEY GUTTER	VCP	VITRIFIED CLAY PIPE
BM	BENCH MARK	CPL	CENTRAL POWER & LIGHT
MH	MAN HOLE		
CONC	CONCRETE		
GB	GRADE BRAKE		

GUIDELINES FOR STREET PLAN SHEETS

EXHIBIT 13B

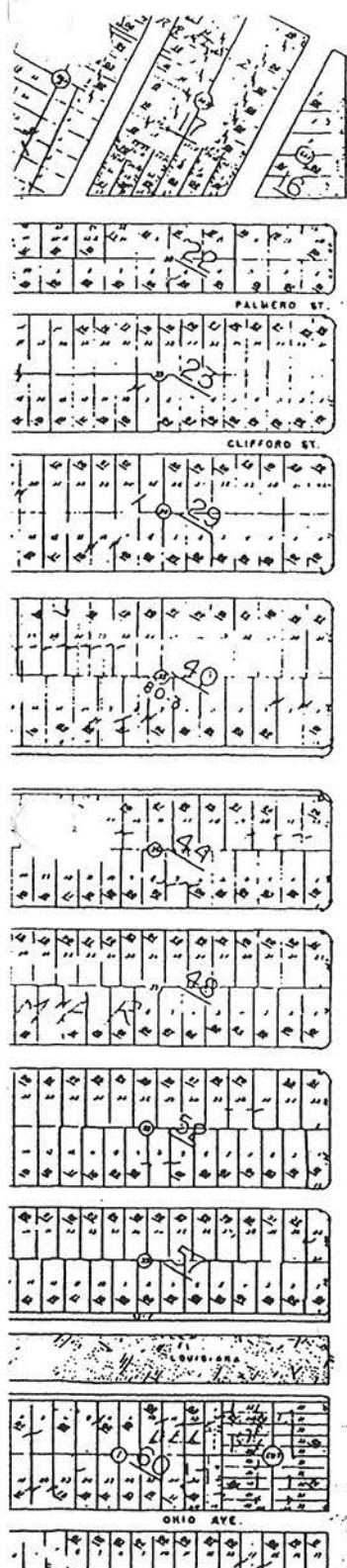
Page 13 of 25

New Document: Dec. 2004

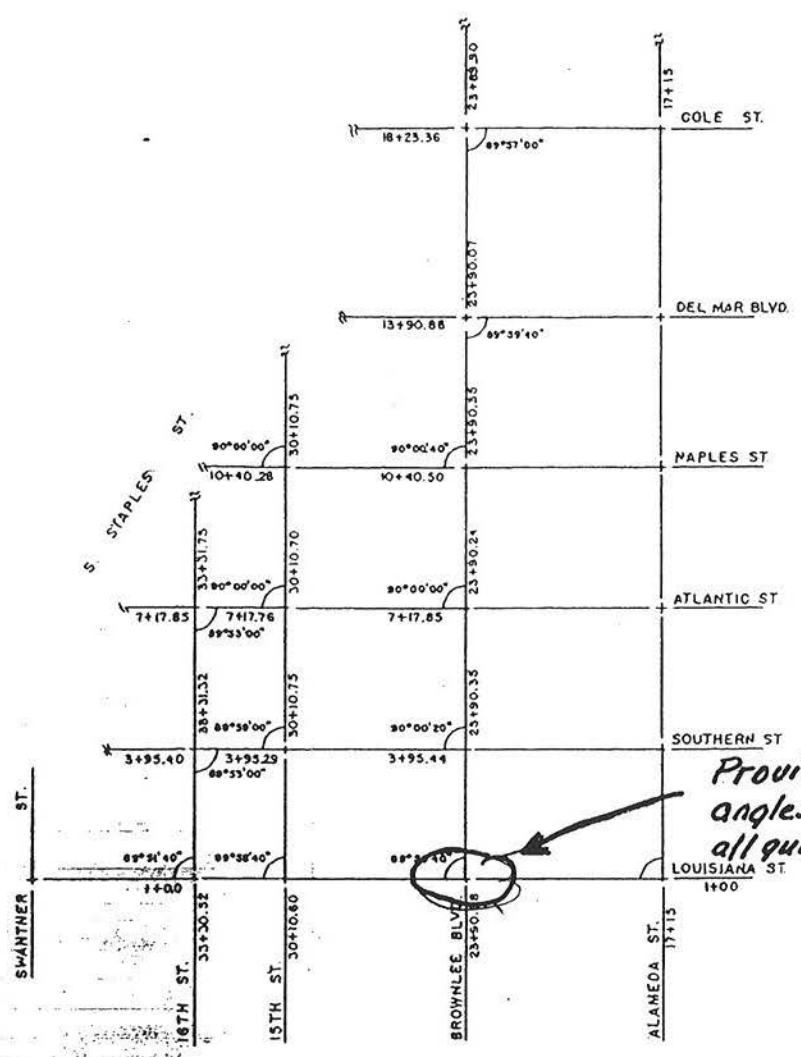
EXHIBIT E

ADDRESS

51



*Brownlee Blvd. STA xx + xx = Louisiana PKwy  
STA xx + xx*



**GUIDELINES FOR STREET PLAN SHEETS  
EXHIBIT 13B  
Page 14 of 25  
New Document: Dec. 2004**

**BASELINE MAP  
NOT TO SCALE**

**EXHIBIT F**

APPROVED: \_\_\_\_\_ Design Engineer  
DATE: \_\_\_\_\_  
SCALE: HORIZONTAL: 1"=200'  
VERTICAL: N/A  
REVISION: \_\_\_\_\_ FIELD BOOK: \_\_\_\_\_

**CITY of CORPUS CHRISTI  
TEXAS**  
Department of Engineering

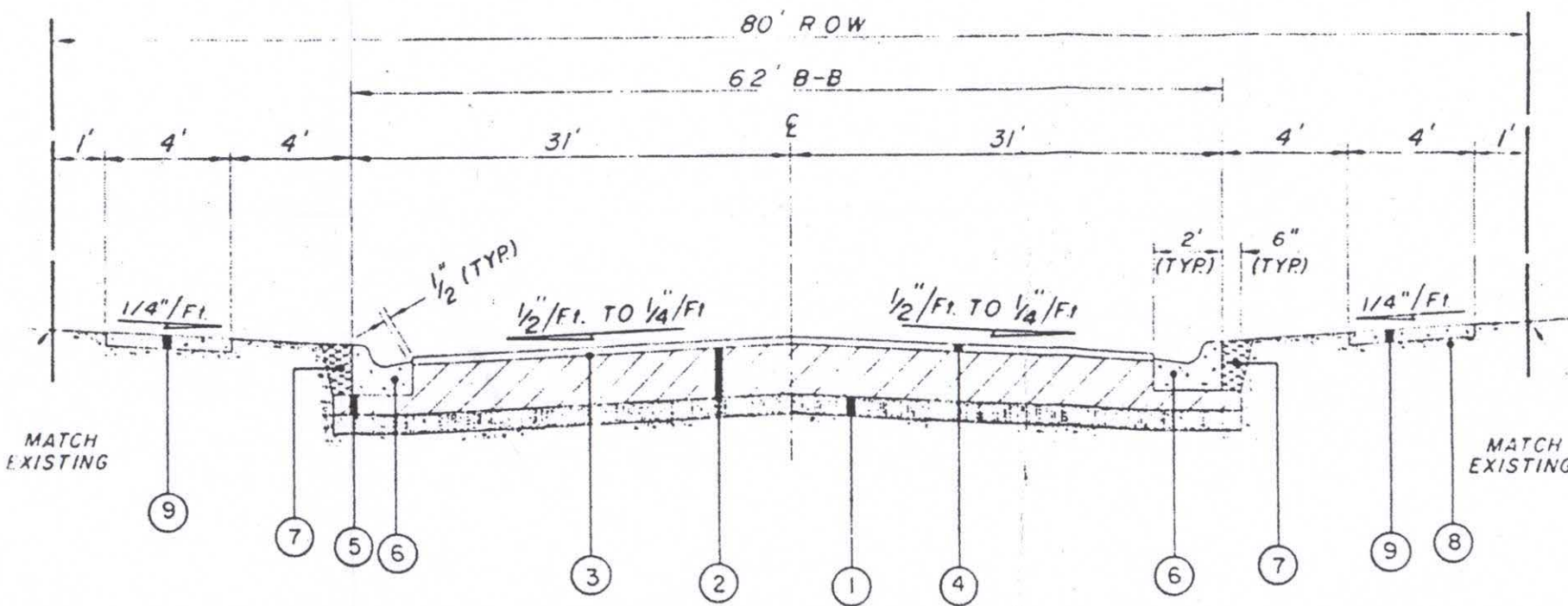
**DEL MAR AREA STREET  
IMPROVEMENTS PHASE III  
PROJECT LAYOUT AND  
BASELINE MAPS**

SHEET **3** of **56**  
DRAWING NO.: **STR.702**

**TYPICAL SECTION LEGEND**

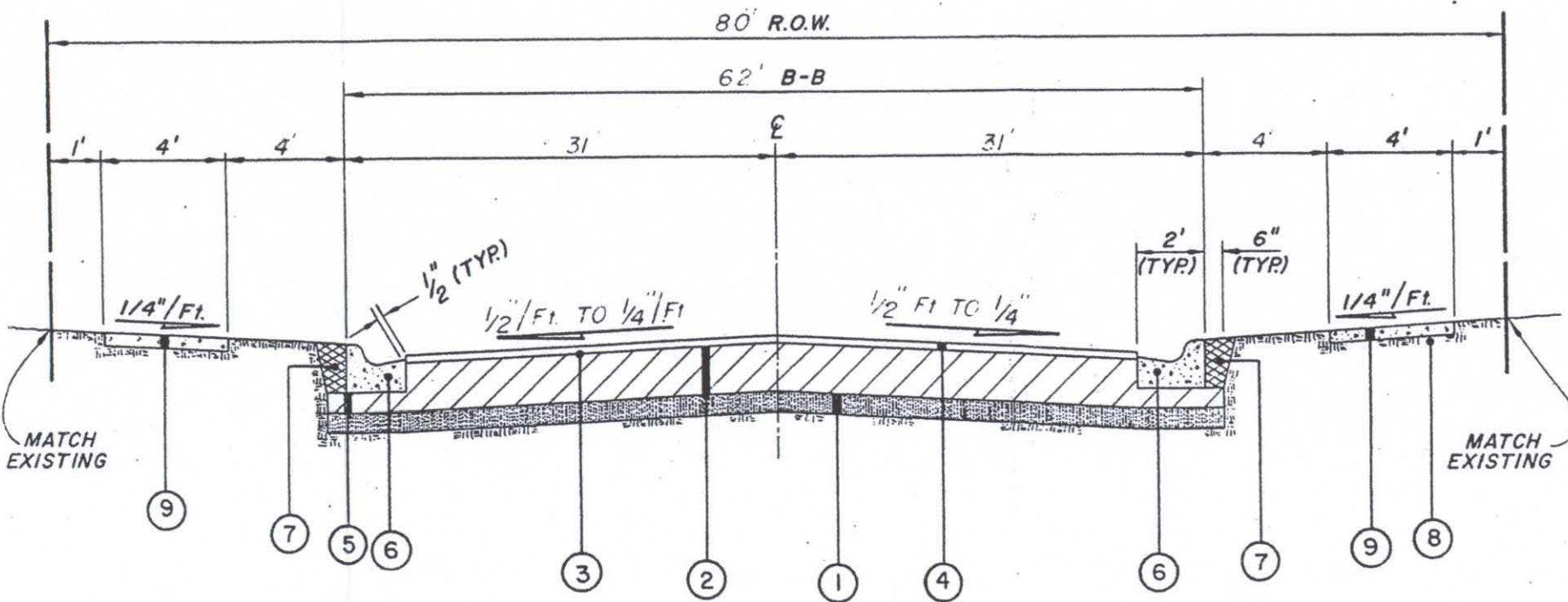
- ① 6" MINIMUM COMPACTED SUB-GRADE (95% STANDARD PROCTOR DENSITY - 5% LIME)
- ② VARIABLE THICKNESS FLEXIBLE BASE CALICHE (8" MINIMUM COMPACTED TO 98% STANDARD PROCTOR DENSITY - 1.5% LIME)
- ③ PRIME COAT (0.15 gal./s.y.)
- ④ 2" MINIMUM TYPE "D" HOT MIX ASPHALTIC CONCRETE OVER 5" TYPE "B" HOT MIX ASPHALTIC CONCRETE (95% DENSITY)
- ⑤ 4" MINIMUM FLEXIBLE BASE CALICHE COMPACTED TO 98% STANDARD PROCTOR DENSITY - 1.5% LIME
- ⑥ 6" STANDARD CURB & GUTTER
- ⑦ BACKFILL COMPACTED TO NATURAL BANK DENSITY
- ⑧ NATURAL GROUND COMPACTED TO NATURAL BANK DENSITY
- ⑨ CONCRETE SIDEWALK

APPROVED: \_\_\_\_\_  
 Design Engineer  
 DATE: 8/24/04  
 SCALE: HORIZONTAL \_\_\_\_\_ VERTICAL \_\_\_\_\_  
 DN B.S. \_\_\_\_\_ DW W.M. \_\_\_\_\_ CK \_\_\_\_\_ REVISION: \_\_\_\_\_ FIELD BOOK: \_\_\_\_\_



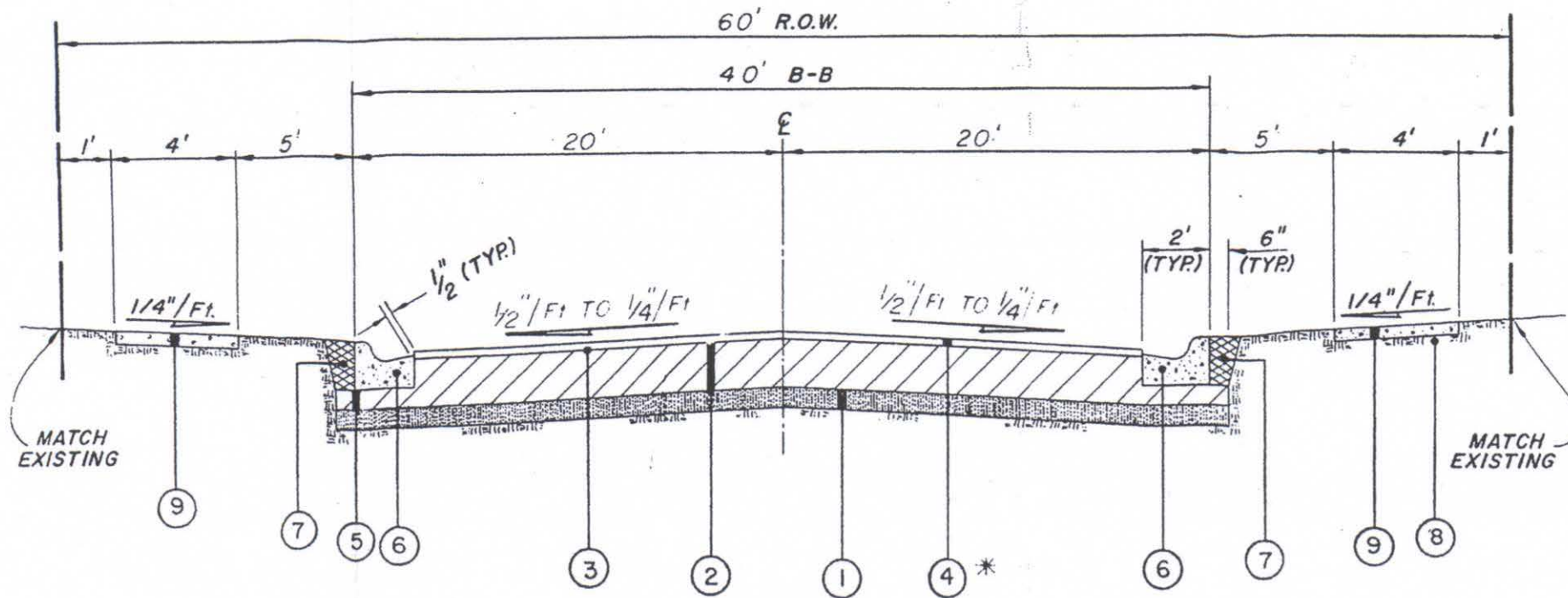
**AIRLINE ROAD**

WOOLDRIDGE ROAD TO HOLLY ROAD



**CIMARRON ROAD**

WOOLDRIDGE ROAD TO AIRLINE ROAD



**MISTY MEADOW ROAD**

CIMARRON ROAD TO P.T. STA. 4 + 79.59

\* TYPE "B" H.M.A.C. NOT REQUIRED

**CITY of CORPUS CHRISTI TEXAS**

Department of Engineering



AIRLINE RD. IMPROVEMENTS  
 PHASE I

TYPICAL STREET SECTIONS/DETAILS

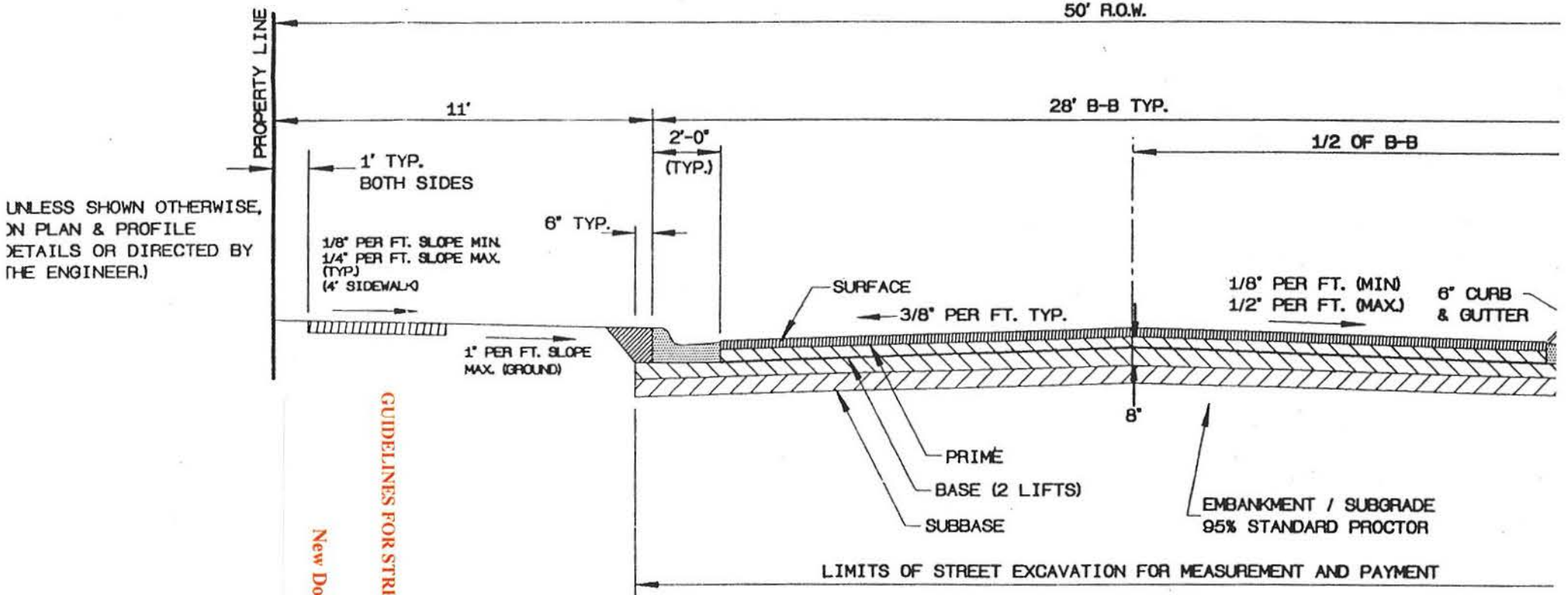
GUIDELINES FOR STREET PLAN SHEETS  
 EXHIBIT 13B  
 Page 15 of 25  
 New Document: Dec. 2004

**EXHIBIT G**

SHEET 4 of 42

**4**

DRAWING NO:  
**STR. 655**



UNLESS SHOWN OTHERWISE, IN PLAN & PROFILE DETAILS OR DIRECTED BY THE ENGINEER.)

GUIDELINES FOR STREET PLAN SHEETS  
EXHIBIT 13B  
Page 16 of 25  
New Document: Dec. 2004

EXHIBIT H

TYPICAL STREET SECTION

NOT TO SCALE

1. STREETS

- A. ALL STREET DIMENSIONS SHOWN ON PLANS ARE TO BACK OF CURB, UNLESS NOTED OTHERWISE.
- B. ALL CURB RADII AT STREET INTERSECTIONS SHALL BE 15', UNLESS NOTED OTHERWISE.
- C. WHERE EXISTING ASPHALT AND CONCRETE ARE TO BE CUT, THESE CUTS SHALL BE VERTICAL AND MADE WITH A SAW.
- D. ASPHALT LAYING MACHINE SHALL BE CAPABLE OF LAYING A 12' WIDTH PER PASS.
- E. THE EXISTING PAVEMENT (SURFACE AND BASE COURSES) SHALL BE SALVAGED AND RE-USED. A SURVEY OF THE EXISTING PAVEMENT IS PROVIDED IN THE APPENDIX OF THE CONTRACT DOCUMENTS. THE EXISTING BASE SHALL BE MIXED WITH FLEXIBLE BASE CALICHE PROVIDED BY THE CONTRACTOR WITH THE PROPOSED BASE BEING A MIXTURE OF 50% SALVAGED BASE AND 50% IMPORTED CALICHE. THE EXISTING SURFACE COURSE SHALL NOT BE INCORPORATED INTO THE PROPOSED BASE. THE EXISTING SURFACE COURSE SHALL BE PULVERIZED SUCH THAT 95% PASSES A 2.5" SIEVE AND MIXED WITH EXISTING BASE MATERIAL TO FORM A MIXTURE TO BE USED AS A 6" THICK SUBBASE OR THE CONTRACTOR SHALL HAVE THE OPTION OF PROVIDING AND USING CALICHE FOR THE SUBBASE RATHER THAN SAID SALVAGE MATERIAL.
- F. THE CONTRACTOR'S ATTENTION IS DRAWN TO THE PAVEMENT MATERIALS SUMMARY AND PAVEMENT COMPOSITION TABLES.

2. SIDEWALKS & DRIVEWAYS

- A. DRIVEWAYS SHALL BE TYPE 'R' & 'TR', UNLESS NOTED OTHERWISE.
- B. DRIVEWAYS SHALL BE CONSTRUCTED SUCH THAT TEXTURED SURFACES ARE NOT REQUIRED, AS IN THE CASE OF CURB RAMPS.
- C. EXISTING DRIVEWAYS, SIDEWALKS, CURB, GUTTER AND STORM SEWER SHALL BE REMOVED AS REQUIRED. THIS WORK IS SUBSIDIARY TO STREET EXCAVATION, UNLESS OTHERWISE SPECIFIED.
- D. THE NUMBER AND LOCATION OF SIDEWALK DRAINS SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER.
- E. SIDEWALK SHALL BE ROUTED AROUND TREES UNLESS THE TREE IS IN POOR CONDITION OR THE TREE IS UNWANTED BY THE ABUTTING PROPERTY OWNER. MINIMUM WIDTH OF SIDEWALK SHALL BE 4 FEET AT JOG AROUND TREE. JOGS AROUND TREES (DETAIL OF SHT. 51) SHALL BE SMOOTH RADIUS TRANSITION. THE LENGTH OF RADIUS TRANSITIONS SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER.
- F. RETAINER WALL ALONG THE BACK OF SIDEWALK SHALL BE CONSTRUCTED TO ACCOMMODATE ABRUPT GRADE DIFFERENCES ALONG THE PROPERTY LINE, WHEN DIRECTED BY THE ENGINEER. RETAINER WALL SHALL BE CONSTRUCTED PER TYPE 'A' HEADER CURB DETAIL OF THE STANDARD DETAILS, WHEN REQUIRED.
- G. CURB RAMPS SHALL BE REQUIRED AT EACH CORNER OF EACH STREET INTERSECTION, AT CROSS WALKS, AND AS DIRECTED BY THE ENGINEER.
- H. DEFECTIVE DRIVEWAYS IN THE AREA BETWEEN SANTA FE, ALAMEDA, PALMERO AND LOUISIANA SHALL BE REPLACED AS DIRECTED BY THE ENGINEER. "REPLACE DEFECTIVE DRIVEWAYS" SHALL BE MEASURED BY THE SQUARE FOOT OF AUTHORIZED DRIVEWAY REPLACED AND THE WORK SHALL INCLUDE, BUT NOT BE LIMITED TO, REMOVAL OF EXISTING DRIVEWAY, REPLACE EXPANSION JOINTS, PLACEMENT OF NEW DRIVEWAY TO MATCH SIZE AND STYLE OF EXISTING DRIVEWAY, AND ALL MATERIALS, LABOR, AND INCIDENTALS REQUIRED. THE NEW DRIVEWAY SHALL MATCH THE STYLE OF THE OLD DRIVEWAY AS SHOWN ON SHEET 52, WITH THE EXCEPTION THAT CLASS 'A' CONCERT SHALL BE USED, STEEL REBAR SHALL BE #4 BARS AT 12" CENTERS EACH WAY, AND THE THICKNESS SHALL BE 6" THROUGHOUT. SAW-CUT AND MATCH GRADES AS APPROPRIATE.
- I. WOOD BLOCK KNOCK OUTS IN THE EXISTING SIDEWALK IN THE AREA BETWEEN SANTA FE, ALAMEDA, PALMERO, AND LOUISIANA SHALL BE REMOVED AND THE REMAINING CAVITY OR VOID IN THE SIDEWALK SHALL BE FILLED WITH LOW STRENGTH CLASS "B" CONCRETE WITH #4 OR #8 AGGREGATE. THERE ARE ABOUT 300 OF THESE KNOCK OUTS WITH APPROXIMATE SIZE AS DEPICTED ON SHEET 52. THIS WORK SHALL BE MEASURED AS "GROUTING KNOCK-OUTS IN SIDEWALK" AND SHALL BE MEASURED BY THE SQUARE FOOT OF AREA GROUTED AND SHALL INCLUDE, BUT NOT BE LIMITED TO REMOVING WOOD KNOCKOUT AND FILLING CAVITY WITH CONCRETE AND ALL LABOR, MATERIALS, AND INCIDENTALS REQUIRED TO COMPLETE THIS WORK.

3. CURB & GUTTER

- A. THE AREA BEHIND THE CURB SHALL BE GRADED WITH EXCAVATED MATERIAL FREE OF DEBRIS, CALICHE, ASPHALT, AND CONCRETE.
- B. CURB AND GUTTER SHALL BE STANDARD 6" CURB UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
- C. WHEN MATCHING NEW 6" CURB & GUTTER TO EXISTING 4", THE GUTTER SLOPE SHALL BE MAINTAINED AND THE 2" TRANSITION SHALL BE IN THE CURB SECTION, AS NECESSARY TO PREVENT PONDING WATER.
- D. A REDWOOD EXPANSION JOINT WITH # 4 DOWEL SHALL BE USED WHERE NEW CURB MATCHES EXISTING.

4. UTILITIES & STORM SEWER

- A. ALL CURB INLETS SHALL HAVE A 5' THROAT, UNLESS NOTED OTHERWISE.
- B. ALL ABANDONED PIPES (OLD WATERLINES, DITCH CULVERTS, SHALLOW UTILITY SERVICES) WITHIN THE LIMITS OF STREET EXCAVATION SHALL BE REMOVED AND PROPERLY DISPOSED. THIS GENERALLY APPLY TO ALL PIPES THAT ARE WITHIN A FOOT OF SUBGRADE AND DITCH CULVERTS AND ANY ABANDONED PIPE THAT IMPACTS THE PROPOSED WORK. ANY ABANDONED LINE TO REMAIN IN PLACE SHALL BE CAPPED AT THE END.
- C. ALL STORM SEWER PIPE SHALL BE CLASS III R.C. PIPE WITH TYPE B WALL AND TONGUE AND GROOVE JOINTS PER ASTM 76.
- D. ELEVATION ADJUSTMENTS FOR MANHOLES AND VALVES SHALL BE DONE FOR NO SEPARATE PAY.
- E. ALL VALVES AND MANHOLES REQUIRING ADJUSTMENT SHALL BE CROSS REFERENCED, AND EXTENDED TO FINISHED GRADE.
- F. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PROTECT EXISTING UTILITIES. ALL PIPES AND UTILITIES DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED TO THE CITY'S SATISFACTION, WITH NO SEPARATE PAY.

- G. PAVEMENT REPAIR ALONG SANTA FE, AYERS, AND OCEAN DRIVE SHALL BE CLASS III, ALL OTHER SHALL BE CLASS I, UNLESS DIRECTED OTHERWISE.
- H. PAVEMENT REPAIR SHALL BE PAID FOR ONLY IF THE REPAIR OCCURS OUTSIDE THE LIMITS OF PROPOSED STREET EXCAVATION.
- I. TIES OR CONNECTIONS OF PROPOSED STORM SEWER TO EXISTING MANHOLES OR EXISTING LINES SHALL BE SUBSIDIARY WORK AND NOT BE MEASURED FOR PAY.

- J. THE EXISTING STORM SEWER HAS BRANCHES THAT EXTEND FROM MANHOLES TO EXISTING INLETS. THE DRAWINGS TYPICALLY SHOW THAT NONE OF THESE BRANCHES ARE TO BE INCORPORATED INTO THE COMPLETED PROJECT. THE CONTRACTOR SHALL ASSIST THE ENGINEER AS NECESSARY IN CHECKING THE CONDITION OF THESE LINES SO THAT THE ENGINEER MAY DETERMINE, IF ANY PORTION OF THESE LINES MAY BE INCORPORATED INTO THE COMPLETED PROJECT. THIS EXISTING PIPE SHALL NOT BE INCORPORATED INTO THE COMPLETED WORK, IF (1) IT'S LESS THAN 15" RCP, (2) IT APPEARS TO BE DEFECTIVE, (3) IT'S AT IMPROPER GRADE, (4) MORE THAN 10 DEGREE JOINT DEFLECTION WOULD RESULT. CONCRETE COLLARS SHALL BE PLACED AT THE UNION OF EXISTING AND PROPOSED PIPE AS DIRECTED BY THE ENGINEER. THE WORK RELATED TO USE OF EXISTING PIPE SHALL NOT BE DEEMED GROUNDS FOR EXTRA COMPENSATION OR MEASURED FOR PAY.
- K. HASTY BACKFILL (1-1/2 SACK PORTLAND CEMENT PER CY OF SAND) SHALL BE USED FOR BACKFILL OF TRENCHES IN SANTA FE AND AYERS.
- L. WATERLINE AND SANITARY BASE MAPS ARE PROVIDED FOR REFERENCE. WATERLINE TIE DRAWINGS ARE PROVIDED IN THE APPENDIX OF THE CONTRACT DOCUMENTS FOR REFERENCE.

- M. NEW WATER AND SANITARY SEWER LINES SHALL TYPICALLY BE PLACED IN THE STREET RIGHT-OF-WAY AND NEW SERVICES SHALL BE RE-ROUTED TO THE SAID NEW MAINS, AFTER WHICH THE EXISTING EASEMENT MAINS SHALL BE ABANDONED. HOWEVER, THERE ARE A FEW EXCEPTIONAL CASES WHERE A NEW UTILITY SHALL BE PLACED IN AN EASEMENT. IF AN EXISTING SERVICE CAN BE RE-CONNECTED TO THE NEW LINE WITHOUT RE-ROUTING THE RE-CONNECTION SHALL SIMPLY BE MEASURED AS A SERVICE CONNECTION. RE-ROUTING IS REQUIRED THE WORK SHALL BE MEASURED AS BOTH, A SERVICE CONNECTION FOR THE PORTION OF THAT WORK WITHIN THE EASEMENT AND A PRIVATE SERVICE CONNECTION FOR THE WORK OUTSIDE THE EASEMENT OR ROW. UTILITIES SHALL REMAIN IN CONTINUOUS OPERATION, EXCEPT FOR BRIEF MINOR INTERRUPTIONS REQUIRED DURING TIES OR CHANGE OVER.
- N. NO SERVICE LINE SHALL BE PLACED ON ABUTTING PRIVATE PROPERTY, IN-OTHER-WORDS NO SERVICE SHALL BE PLACED ON THE NEIGHBORS PROPERTY.
- O. CONTRACTOR SHALL MARK LOCATION OF AS-BUILT PRIVATE SANITARY AND WATER SERVICES ON THE AERIAL PHOTOGRAPH INCLUDED IN THE DRAWINGS AND SUBMIT TO THE ENGINEER, BEFORE INSPECTION WILL BE CONDUCTED.
- P. THE CONTRACTOR SHALL SIGN THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP-ATTACHMENT TO DRAWINGS), PRIOR TO BEGINNING WORK.
- Q. UTILITY EASEMENTS CONTAIN ENCROACHMENTS OR IMPROVEMENTS. EXISTING IMPROVEMENTS EITHER WITHIN OR ABUTTING EASEMENT SHALL BE PROTECTED BY THE CONTRACTOR WHEN WORKING WITHIN EASEMENTS. DAMAGED IMPROVEMENTS SHALL BE REPLACED WITH LIKE OR BETTER. IN THE EVENT THAT REPLACEMENT OF IMPROVEMENTS APPEARS TO BE IMPRACTICAL, THE CONTRACTOR SHALL BORE AND CASE PROPOSED UTILITIES. THIS WORK SHALL BE CONSIDERED SUBSIDIARY AND, IF CASING IS USED, IT SHALL BE OF AN APPROVED TYPE.
- R. EXISTING STORM SEWER INLETS, THAT ARE NOT INCORPORATED INTO THE FINAL WORK, SHALL BE REMOVED. EXISTING INLETS THAT ARE TO BE INCORPORATED INTO THE FINAL WORK SHALL BE REWORKED AND ADJUSTED FOR GRADE AS NECESSARY WITH SAID WORK BEING CONSIDERED SUBSIDIARY.
- S. WHEN PLACING PROPOSED UTILITY LINES UNDER EXISTING CONCRETE CURB & GUTTER, SIDEWALK, OR DRIVEWAY THAT ARE NOT SCHEDULED FOR REPLACEMENT, THE PROPOSED UTILITY SHALL BE PLACED BY BORING OR JACKING UNDER SAID CONCRETE STRUCTURES. IF BORING IS UNPRACTICAL, THE CONTRACTOR SHALL REMOVE AND REPLACE WITH LIKE OR BETTER, IF AUTHORIZED BY THE ENGINEER. THIS SHALL BE CONSIDERED SUBSIDIARY WORK.

5. SANITARY SEWERS

- A. MAIN, SERVICE LINE AND PRIVATE SERVICES SHALL PASS LEAKAGE TESTING PRIOR TO CHANGE-OVER.
- B. SANITARY SEWER MAY BE CONSTRUCTED OF EITHER PVC OR VCP IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT AT WATERLINE CROSSINGS IN WHICH CASE IT SHALL BE PVC.
- C. ABANDONED SANITARY MAINS AND SERVICES SHALL BE PLUGGED. THE UPPER 5 FEET OF ABANDONED MANHOLES AND ABANDONED CLEAN-OUTS SHALL BE REMOVED AND THE EXCAVATIONS SHALL BE BACKFILLED WITH SELECT MATERIAL COMPACTED TO NATURAL GROUND DENSITY OR A MINIMUM OF 95% STD PROCTOR.
- D. EXIST. SAN. MANHOLES THAT ARE TO REMAIN IN SERVICE AND BE WITHIN THE LIMITS OF STREET EXCAVATION SHALL BE FITTED WITH A FIBERGLASS LINER AND BE RECONSTRUCTED AS A FIBERGLASS MANHOLE. NEW SANITARY MANHOLES SHALL BE FIBERGLASS.
- E. NEITHER BLUE PVC PIPE NOR DUCTILE IRON PIPE SHALL BE USED FOR SANITARY SEWERS.
- F. REGARDING PAYMENT, PRIVATE SANITARY SEWER SERVICES CONSIST OF THOSE LINES THAT EXTEND FROM A BUILDING TO THE CLEAN-OUT AT THE PROPERTY LINE AND SANITARY SERVICES CONSIST OF THOSE LINES THAT EXTEND FROM THE CLEAN OUT AT THE PROPERTY LINE TO THE MAIN IN THE STREET.
- G. PRIVATE SERVICE LINES ARE REQUIRED WHEN AN EASEMENT LINE IS BEING ABANDONED AND SERVICE IS BEING RE-ROUTED TO A STREET MAIN. SERVICE LINES ARE REQUIRED WHEN EXISTING SERVICES ARE TIED INTO A NEW MAIN; IN OTHER WORDS ALL SERVICES WITHIN THE STREET ROW SHALL BE REPLACED, BUT WORK ON PRIVATE PROPERTY SHALL NOT BE REQUIRED IF RE-ROUTING IS NOT NECESSARY.
- H. WHERE NEW SANITARY SEWERS ARE TO EXTEND ADJACENT TO AN EXISTING WATERLINE AT A LATERAL CLEARANCE OF LESS THAN 9 FEET, THAT SECTION OF SEWER SHALL BE PRESSURE RATED PVC, AWWA C900-DR25 NON-BLUE COLORED, AND MANHOLES SHALL BE OF FIBERGLASS, BUILT AND TESTED FOR NO LEAKS.
- G. SANITARY MANHOLE COVERS SHALL BE FITTED WITH .187" THICK POLYETHYLENE INFLOW INHIBITORS. THE INFLOW INHIBITOR OR DISH SHALL BE OF HIGH DENSITY POLYETHYLENE PER ASTM 1248, CLASS 'A', CATEGORY 5, TYPE 111. ALL MATERIALS USED IN THE MANUFACTURE OF THE DISH SHALL BE RESIST CORROSION OF SEWER GASSES. THE DISH SHALL BE FITTED WITH A LIFTING STRAP. INFLOW INHIBITORS SHALL BE MEASURED AS "SANITARY MANHOLE INFLOW INHIBITORS" PER EACH INHIBITOR INSTALLED.

6. WATERLINES

- A. WATER METERS SHALL BE ACCESSIBLE DURING CONSTRUCTION.
- B. THE CONTRACTOR SHALL BE REQUIRED TO MAKE SOME CONNECTIONS DURING LOW DEMAND PERIODS SUCH AS IN THE EVENINGS. CONSIDERED IT SUBSIDIARY TO THE PROJECT.
- C. VALVE BOXES TO REMAIN IN SERVICE SHALL BE ADJUSTED TO GRADE. CONSIDER IT SUBSIDIARY.
- D. ABANDONED WATER FITTINGS, VALVES, FIRE HYDRANTS, ETC. SHALL BE RECOVERED AND STOCKPILED AT A SECURE LOCATION BY THE CONTRACTOR FOR SALVAGE BY THE CITY. HOWEVER, ALL RELATED ITEMS THAT ARE UNWANTED BY THE CITY SHALL BECOME PROPERTY OF THE CONTRACTOR AND DISPOSED OF IN AN APPROPRIATE MANNER.
- E. PRIVATE WATER SERVICE LINES CONSIST OF THOSE LINES THAT EXTEND FROM A BUILDING TO THE METER. WATER SERVICE LINES ARE THOSE LINES THAT EXTEND FROM THE METER TO THE MAIN.
- F. PRIVATE SERVICE LINES ARE REQUIRED WHEN AN EASEMENT LINE IS BEING ABANDONED AND SERVICE IS BEING RE-ROUTED TO A STREET MAIN. SERVICE LINES ARE REQUIRED WHEN EXISTING SERVICES ARE TIED INTO A NEW MAIN. ADJUSTMENTS OF METERS AND EXISTING SERVICES SHALL BE CONSIDERED SUBSIDIARY WORK.
- G. WHERE SANITARY SEWER AND WATERLINES CROSS, THE WATERLINE SHALL BE PLACED OVER THE SEWER WITH A MINIMUM SEPARATION OF 2 FEET. IF THIS IS NOT POSSIBLE, EITHER THE SEWER OR THE WATERLINE SHALL BE CASED WITH A STANDARD 18 FOOT LENGTH OF PIPE PER STANDARD WATERLINE DETAILS.
- H. WATERLINES SHALL TYPICALLY BE PLACED 36" BELOW FINAL GRADE. HOWEVER, BECAUSE OF POTENTIAL CONFLICTS, IT MUST BE PLACED DEEPER AT CRITICAL LOCATIONS, AS ILLUSTRATED IN SOME PROFILES. IT IS NOT INTENDED THAT THE LINES BE PLACED AT THESE DEEPER DEPTHS FOR LONG DISTANCES. THESE DEPTH ARE TYPICALLY TO BE ATTAINED BY VERTICAL OFFSETS WITH 45 OR 22.5 BENDS AND EXTEND SHORT DISTANCES. THIS WORK SHALL BE COORDINATED WITH THE WATER DEPARTMENT INSPECTOR.

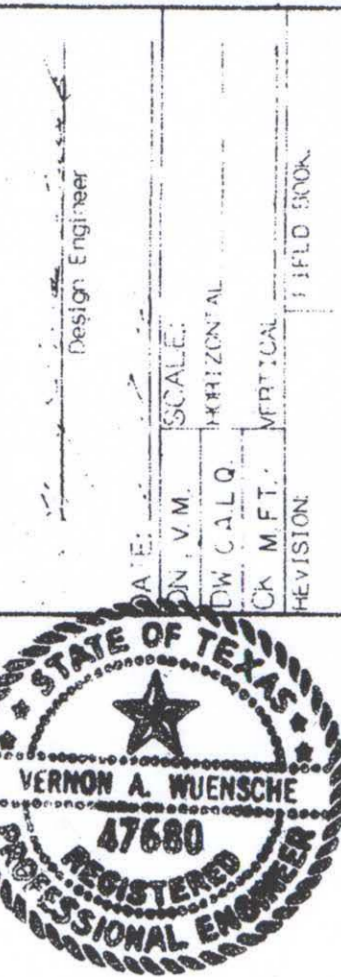
7. SPECIAL RESTRICTIONS FOR SEQUENCING WORK

- A. STREET EXCAVATION SHALL NOT PRECEDE COMPACTED BASE BY NO MORE THAN 1,000 FEET.
- B. DRIVEWAY CONSTRUCTION SHALL FOLLOW CURB CONSTRUCTION BY NO MORE THAN A DAY OR TWO.
- C. HOT-MIX SHALL FOLLOW COMPLETED BASE BY LESS THAN 1,000 FEET.
- D. DEFLECTION TESTING OF PVC SANITARY SEWER SHALL FOLLOW BACKFILL BY NOT LESS 30 DAYS.
- E. UTILITIES TO BE ABANDONED SHALL BE MAINTAINED BY THE CONTRACTOR AND REMAIN IN SERVICE UNTIL THE APPROPRIATE SERVICE CHANGE-OVERS HAVE BEEN COMPLETED BY THE CONTRACTOR AND ACCEPTED FOR USE BY THE OPERATING DEPARTMENT.
- F. TRENCH EXCAVATION SHALL NOT PRECEDE BACKFILL BY MORE THAN 200 FEET. NO TRENCH SHALL BE LEFT OPEN AFTER NORMAL WORKING HOURS.

8. MISCELLANEOUS

- A. CONCRETE SHALL BE SAW CUT WHERE AN EXISTING CONCRETE STRUCTURE IS TO BE PARTIALLY REMOVED.
- B. FENCES SHALL BE RELOCATED AS DIRECTED BY THE ENGINEER.
- C. TREE TRIMMING SHALL BE DONE IN ACCORDANCE WITH STANDARD HORTICULTURAL PRACTICE. TREES WITHIN THE ROW SHALL BE REMOVED AS DIRECTED BY THE ENGINEER.
- D. SPRINKLER SYSTEM SHALL BE PROTECTED AND SHALL BE RESTORED PRIOR TO ACCEPTANCE OF PROJECT.
- E. PRIMING AND HOT-MIX PAVING OPERATIONS SHALL NOT BE CONDUCTED ON DAYS FOR WHICH AN OZONE ADVISORY HAS BEEN ISSUED, EXCEPT FOR REPAIRS. IF A DELAY SUCH AS THIS IS EXPERIENCED, THE DAY WILL NOT BE COUNTED AS A WORK DAY AND THE CONTRACTOR SHALL BE COMPENSATED AT THE UNIT PRICE INDICATED IN THE PROPOSAL.
- F. SEEDING SHALL BE BY SPOT SODDING PER STANDARD SPECIFICATIONS AS DIRECTED BY THE ENGINEER.
- G. SURVEY MARKERS SHALL BE PLACED AS DIRECTED BY THE CITY SURVEYOR.
- H. PROTECT SPRINKLER SYSTEMS. REPAIRS SHALL BE TO THE SATISFACTION OF THE OWNER OF THE SPRINKLER. NOTIFY OWNER OF SPRINKLER SYSTEM OF ANY CUT LINES IMMEDIATELY. REPAIR DAMAGES IMMEDIATELY AFTER BACKFILLING OF TRENCH, IF APPLICABLE.

U-5  
9-27-96



CITY of CORPUS CHRISTI  
TEXAS  
Department of Engineering Services

DEL MAR AREA STREET  
IMPROVEMENTS PHASE ONE  
GENERAL NOTES

GUIDELINES FOR STREET PLAN SHEETS  
EXHIBIT 1.1B  
Page 17 of 25  
New Document: Dec. 2004

EXHIBIT 1

COMBINED ESTIMATE SUMMARY

BASE BID

ADDITIVE ALT. #1

ADDITIVE ALT. #2

ADDITIVE ALT. #3

ALT. ADD #4

Table with columns: Units, Louis., South., Atl., Nap., Del M., Cole, San. Fe, San. Fe, Jrd., Jrd., 2nd, Adjoin., Total Quant. Rows include STREET WORK, DRAINAGE WORK, WATERLINES, SANITARY SEWERS.

Table with columns: Louis., South., Atl., Nap., Del M., Cole, San. Fe, Jrd., Jrd., 2nd, Adjoin., Base Bid, Total Quant. Rows include STREET WORK, DRAINAGE WORK, WATERLINES, SANITARY SEWERS.

Table with columns: Del M., Cole, Jrd., 2nd, Add Alt. #1, Total Quant. Rows include STREET & STORM, WASTEWATER, WATER.

Table with columns: Louis., San. Fe, Add Alt. #2, Total Quant. Rows include WATER.

Table with columns: Jrd., South., Atl., Nap., Add Alt. #3, Total Quant. Rows include WATER.

Table with columns: Add Alt. #4, Total Quant. Rows include WATER.

Vertical text: CITY of CORPUS CHRISTI TEXAS Department of Engineering Services. Includes a seal and drawing information: DEL MAR AREA STREET IMPROVEMENTS PHASE ONE ESTIMATE SUMMARY SHEET, SHEET 4A of 52, DRAWING NO: STR 710.

EXHIBIT J

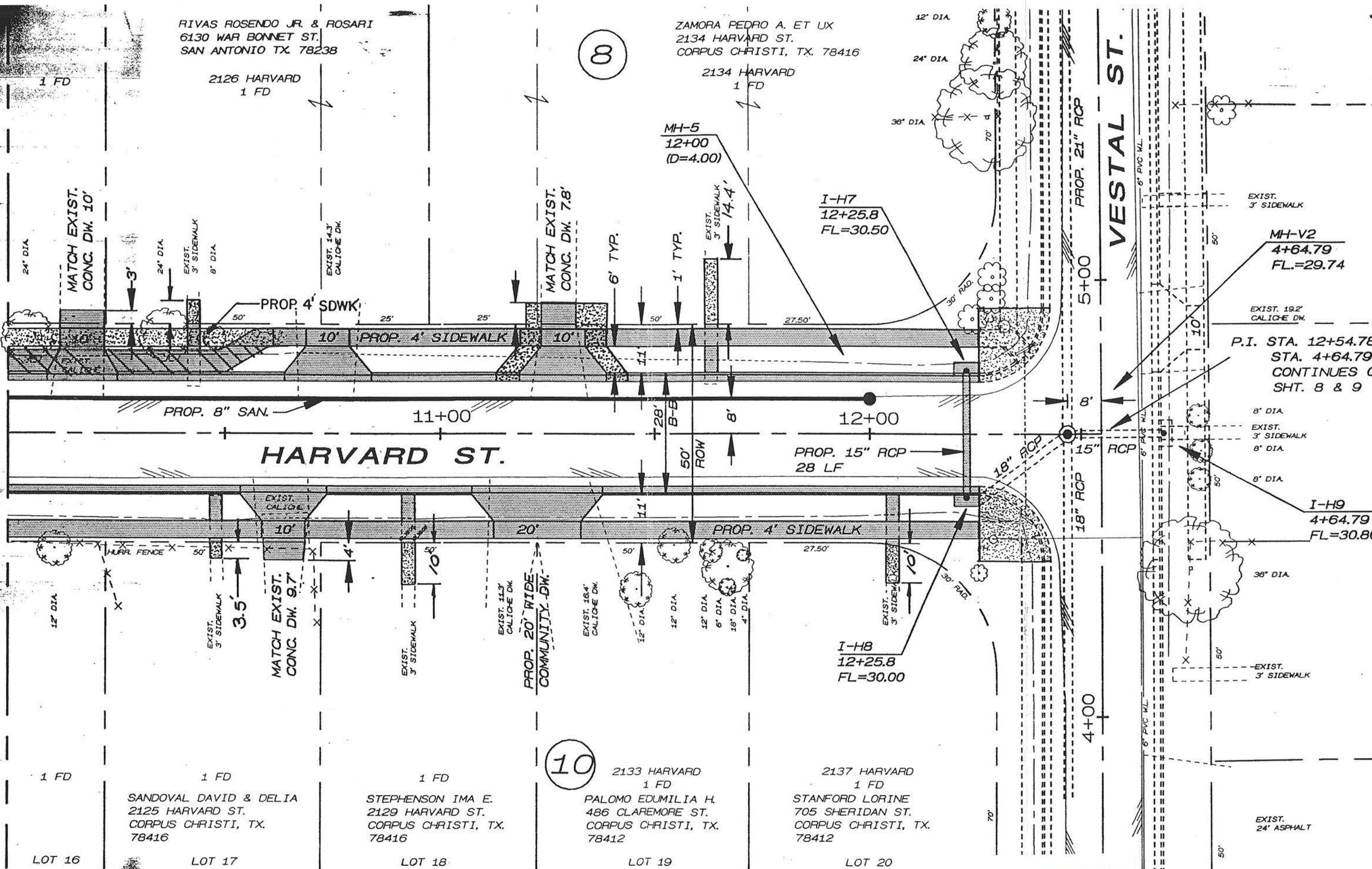
GUIDELINES FOR STREET PLAN SHEETS EXHIBIT 13B Page 18 of 25 New Document: Dec. 2004

MATCH LINE STA. 10+00

RIVAS ROSENDO JR. & ROSARI  
6130 WAR BONNET ST.  
SAN ANTONIO TX. 78238

ZAMORA PEDRO A. ET UX  
2134 HARVARD ST.  
CORPUS CHRISTI, TX. 78416

8



VESTAL ST.

HARVARD ST.

SANDOVAL DAVID & DELIA  
2125 HARVARD ST.  
CORPUS CHRISTI, TX.  
78416

STEPHENSON IMA E.  
2129 HARVARD ST.  
CORPUS CHRISTI, TX.  
78416

2133 HARVARD  
1 FD  
PALOMO EDMILIA H.  
486 CLAREMORE ST.  
CORPUS CHRISTI, TX.  
78412

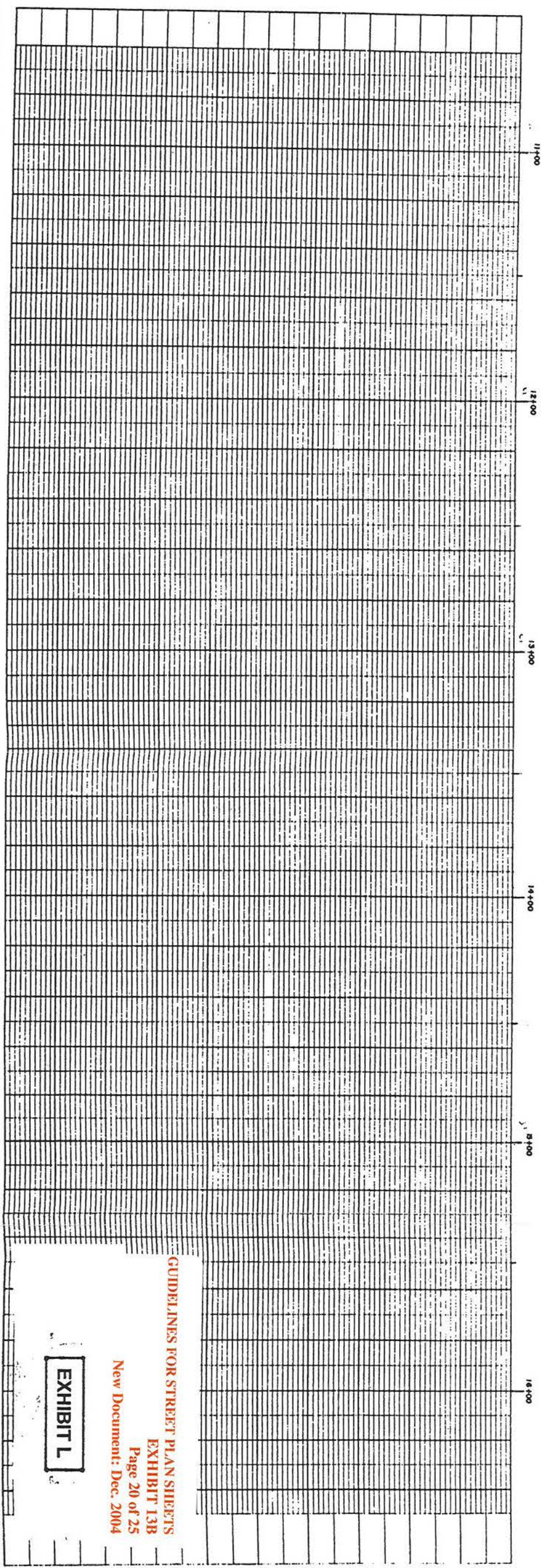
2137 HARVARD  
1 FD  
STANFORD LORINE  
705 SHERIDAN ST.  
CORPUS CHRISTI, TX.  
78412

10

M I D W A Y   A D D ' N

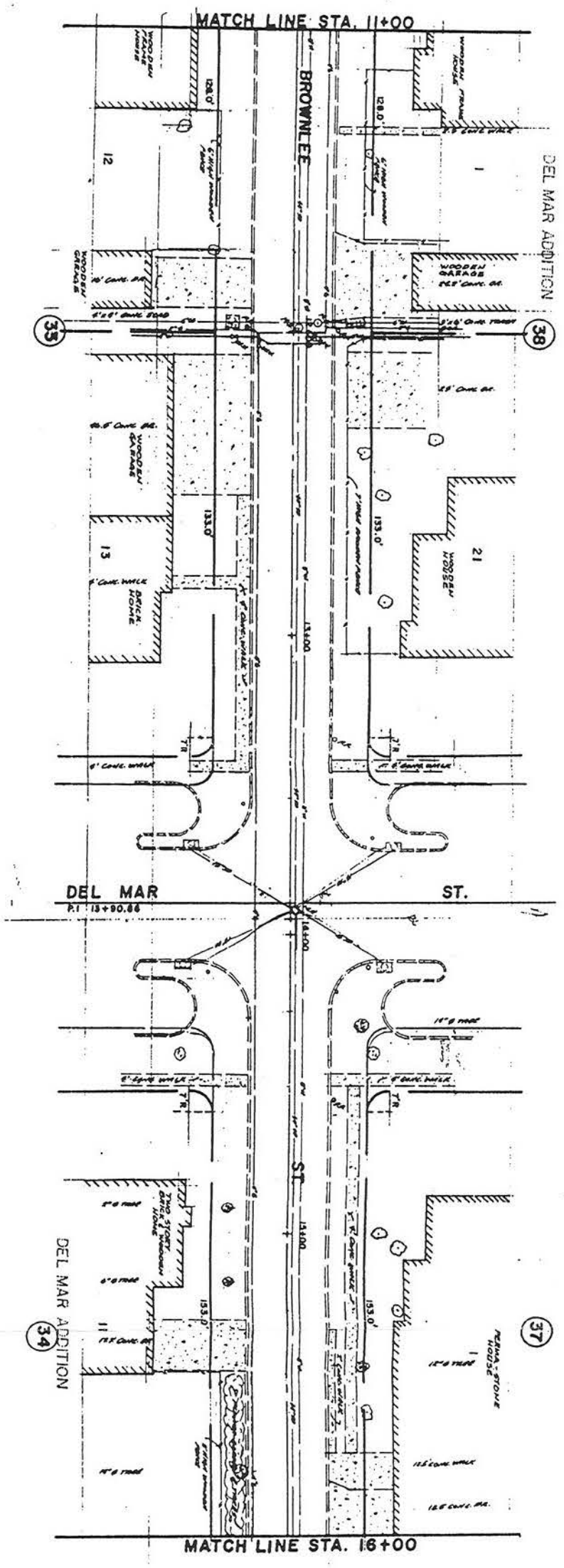
EXHIBIT K





GUIDELINES FOR STREET PLAN SHEETS  
 EXHIBIT 13B  
 Page 20 of 25  
 New Document: Dec. 2004

EXHIBIT L



SHEET 3 of 3  
 DRAWING NO. STR. 701

**DEL MAR AREA STREET IMPROVEMENTS. PHASE III**  
**BROWNLEE ST.**  
 STA. 11+00 TO STA. 16+00



**CITY of CORPUS CHRISTI TEXAS**  
 Department of Engineering

APPROVED:	Design Engineer
DATE:	
SCALE:	HORIZONTAL 1" = 20'
	VERTICAL 1" = 2'
REVISION:	FIELD BOOK:

**FRONTAGE RD.**

STA. 0+12.5 (44' LT) = END C & G  
AND 4' SIDEWALK  
MATCH EXISTING GRADES

STA. 0+9.5  
LIMITS OF PAVING CONSTRUCTION  
MATCH EXISTING GRADES

STA. 0+14.2 (44' RT.) = END C & G  
MATCH EXISTING GRADES

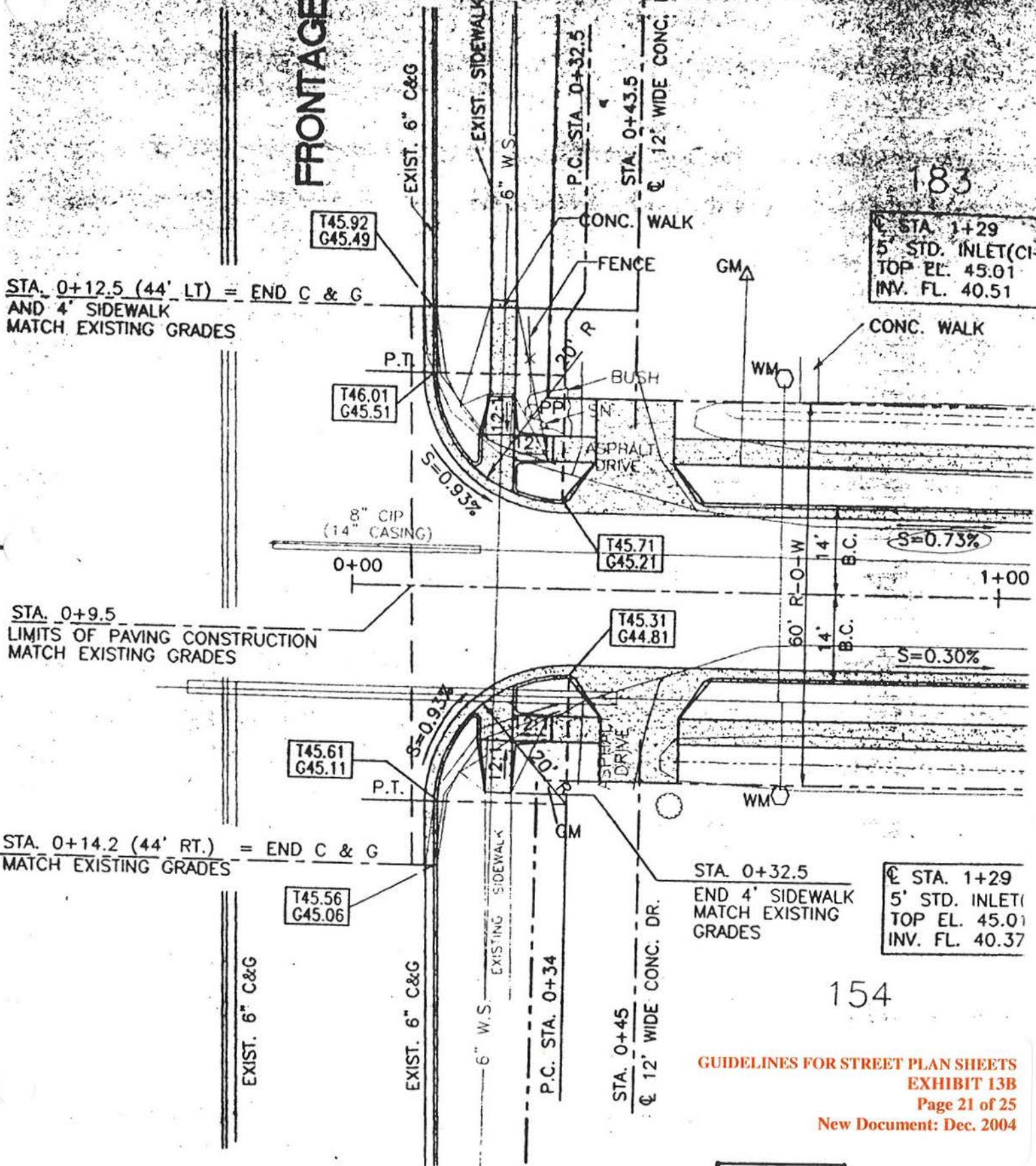
EXIST. 6" C&G  
EXIST. 6" C&G  
6" W.S.  
EXISTING SIDEWALK

P.C. STA. 0+34  
STA. 0+45  
12' WIDE CONC. DR.

STA. 0+32.5  
END 4' SIDEWALK  
MATCH EXISTING  
GRADES

183  
STA. 1+29  
5' STD. INLET (CI)  
TOP EL. 45.01  
INV. FL. 40.51

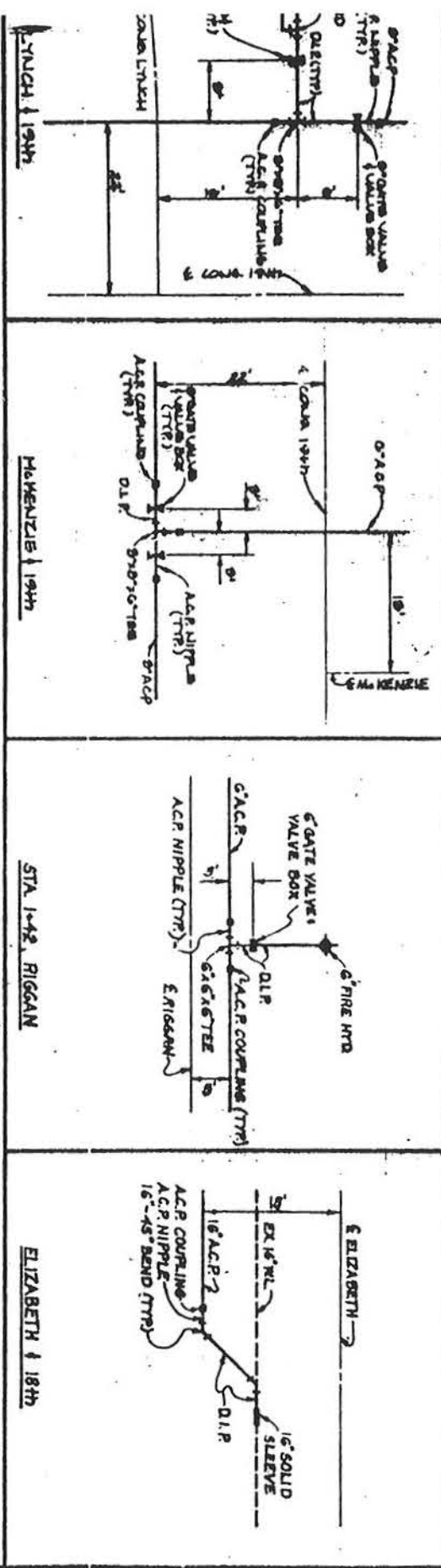
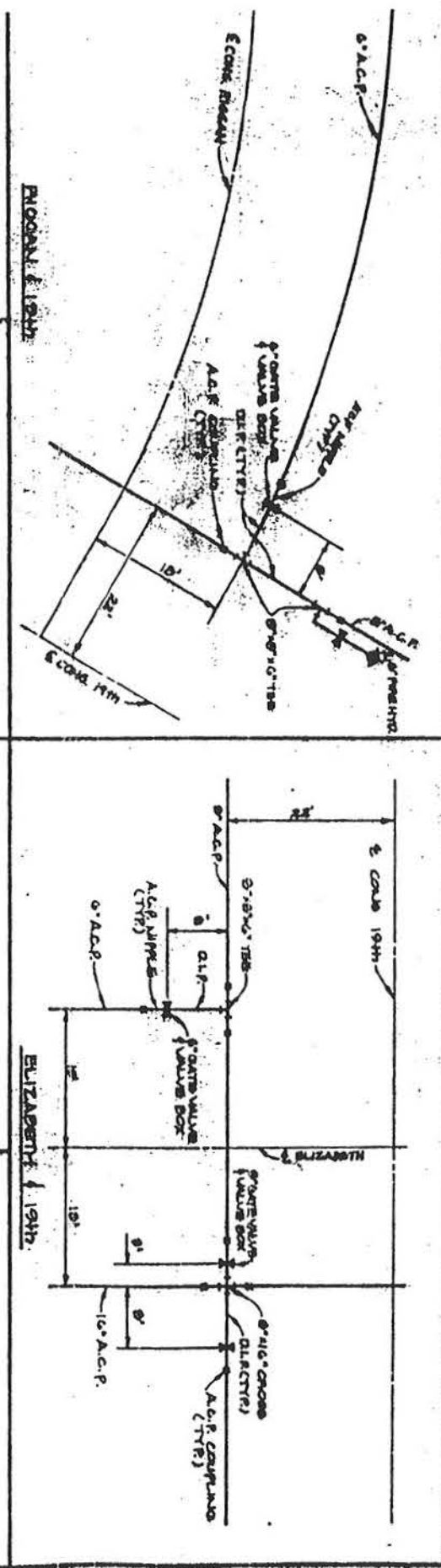
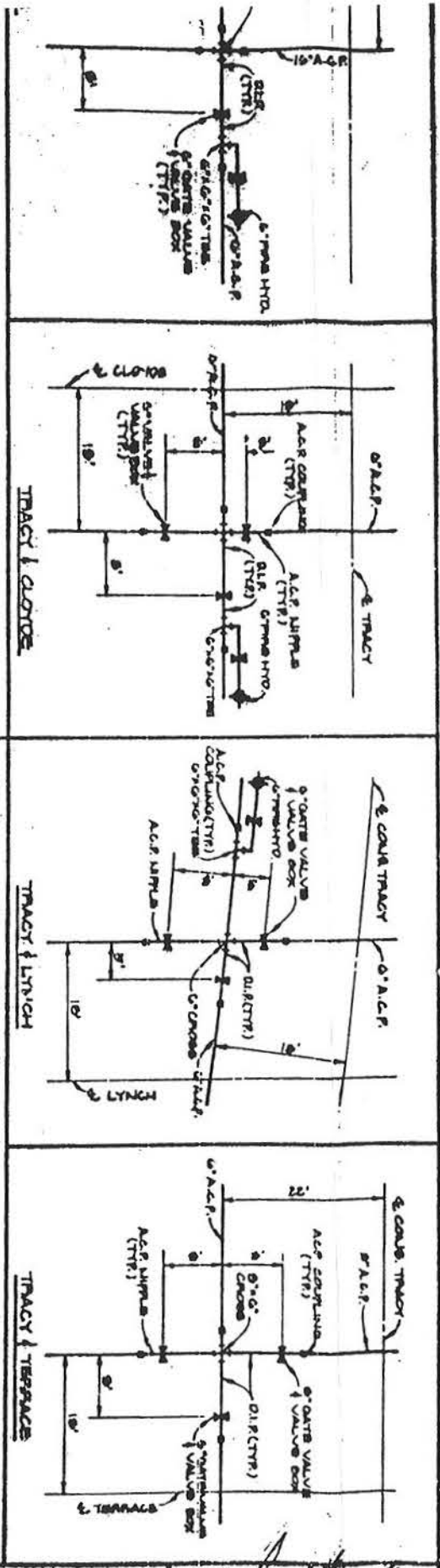
STA. 1+29  
5' STD. INLET (CI)  
TOP EL. 45.01  
INV. FL. 40.37



154

**EXHIBIT M**

EXHIBIT N

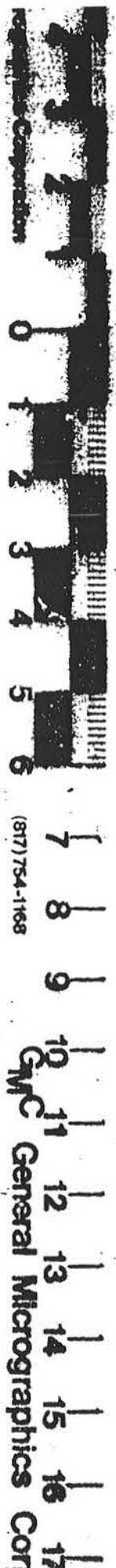


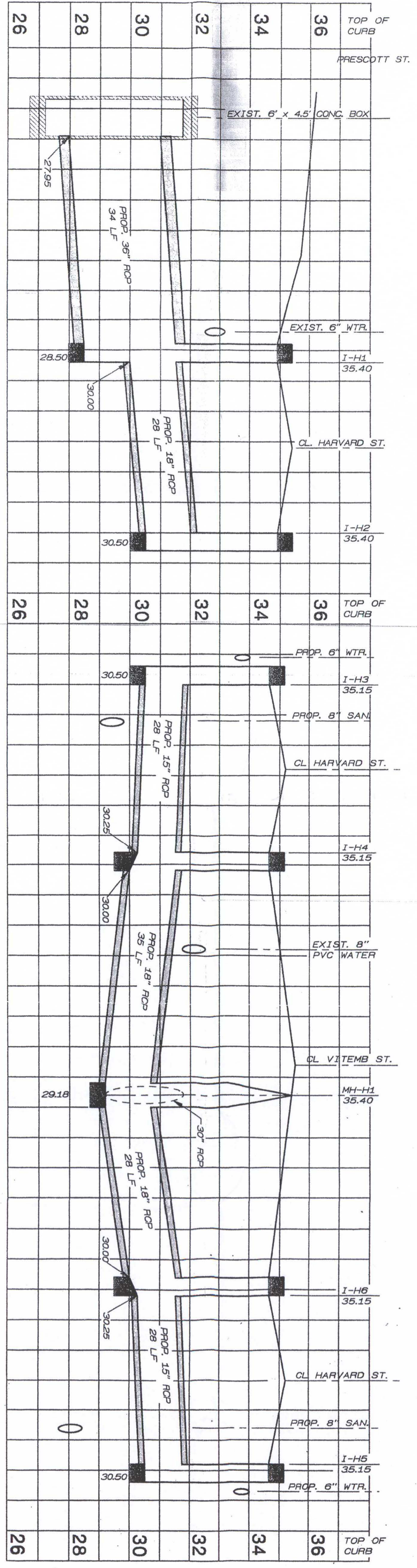
APPROVED: *[Signature]*  
 DATE: 12/1/04  
 SCALE: HORIZONTAL 1" = 10'  
 VERTICAL 1" = 10'  
 STR 098

**CITY of CORPUS CHRISTI TEXAS**  
 Engineering and Physical Development

TRACY ADDITION  
 STREET IMPROVEMENTS  
 WATER VALVE & FITTING  
 LOCATION DETAIL

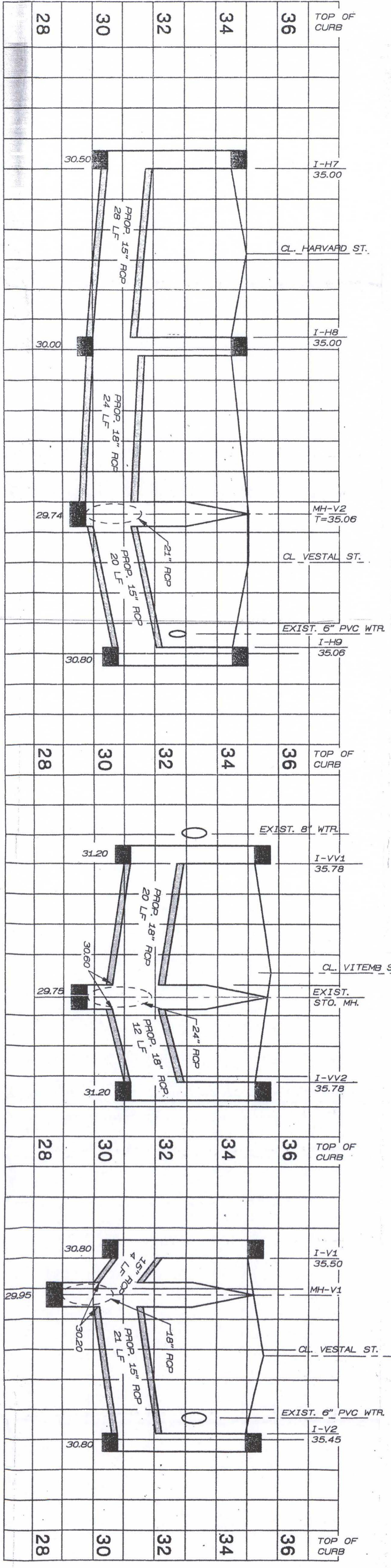
SHEET 4 of 41  
 DRAWING NO.  
 STR 098





SHEET #4

SHEET #5



SHEET #6 & #9

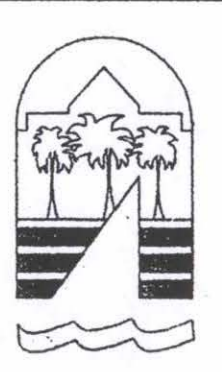
SHEET #7

SHEET #8

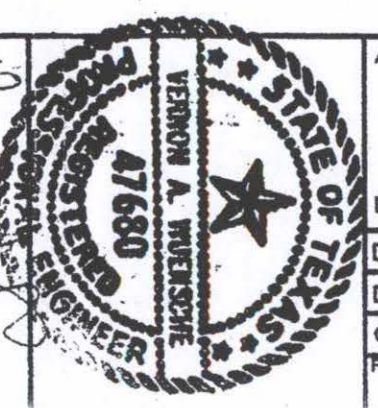
AS BUILT  
3/11/17

EXHIBIT O GUIDELINES FOR STREET PLAN SHEETS  
EXHIBIT 13B  
Page 23 of 25  
New Document: Dec, 2004

HARVARD STREET IMPROVEMENTS  
STORM SEWER INLET PROFILES

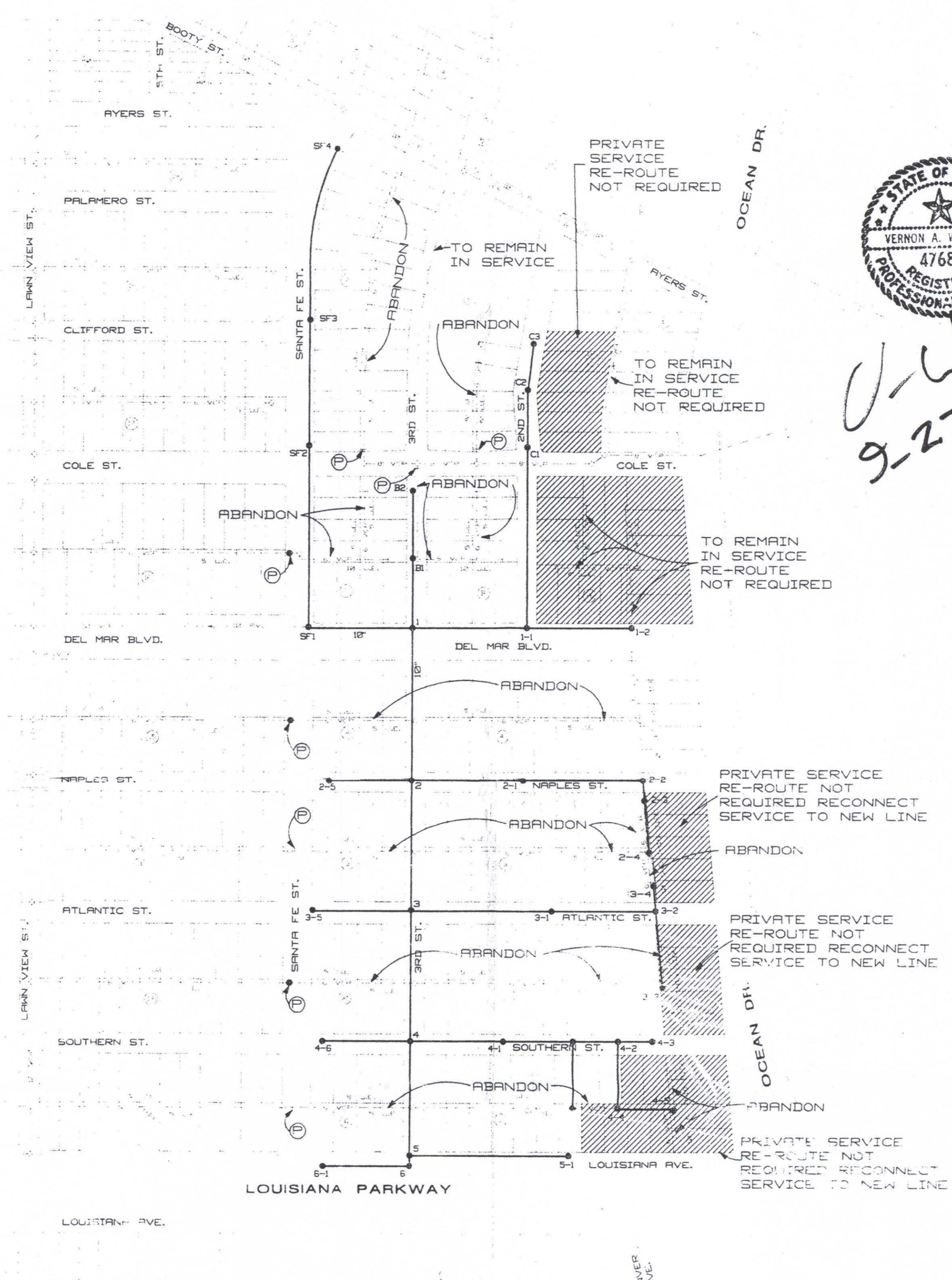
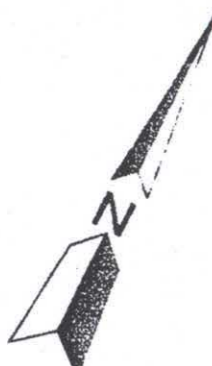


CITY of CORPUS CHRISTI TEXAS  
Department of Engineering Services



APPROVED: [Signature]  
DATE: 7-30-18  
SCALE: HORIZONTAL 1" = 10'  
VERTICAL 1" = 2'  
REVISIONS: [Table]

SHEET 10 of 19  
DRAWING NO. STR. 717



ALL WASTEWATER  
IN BASE BID

SAN. SEWER PROP. & EXIST. MAP

SCALE 1"=200'

GUIDELINES FOR STREET PLAN SHEETS  
EXHIBIT 13B  
Page 24 of 25  
New Document: Dec. 2004

EXHIBIT P

APPROVED: \_\_\_\_\_  
DATE: \_\_\_\_\_  
DN: \_\_\_\_\_  
DW: \_\_\_\_\_  
OK: \_\_\_\_\_  
SCALE: \_\_\_\_\_  
Design Engineer



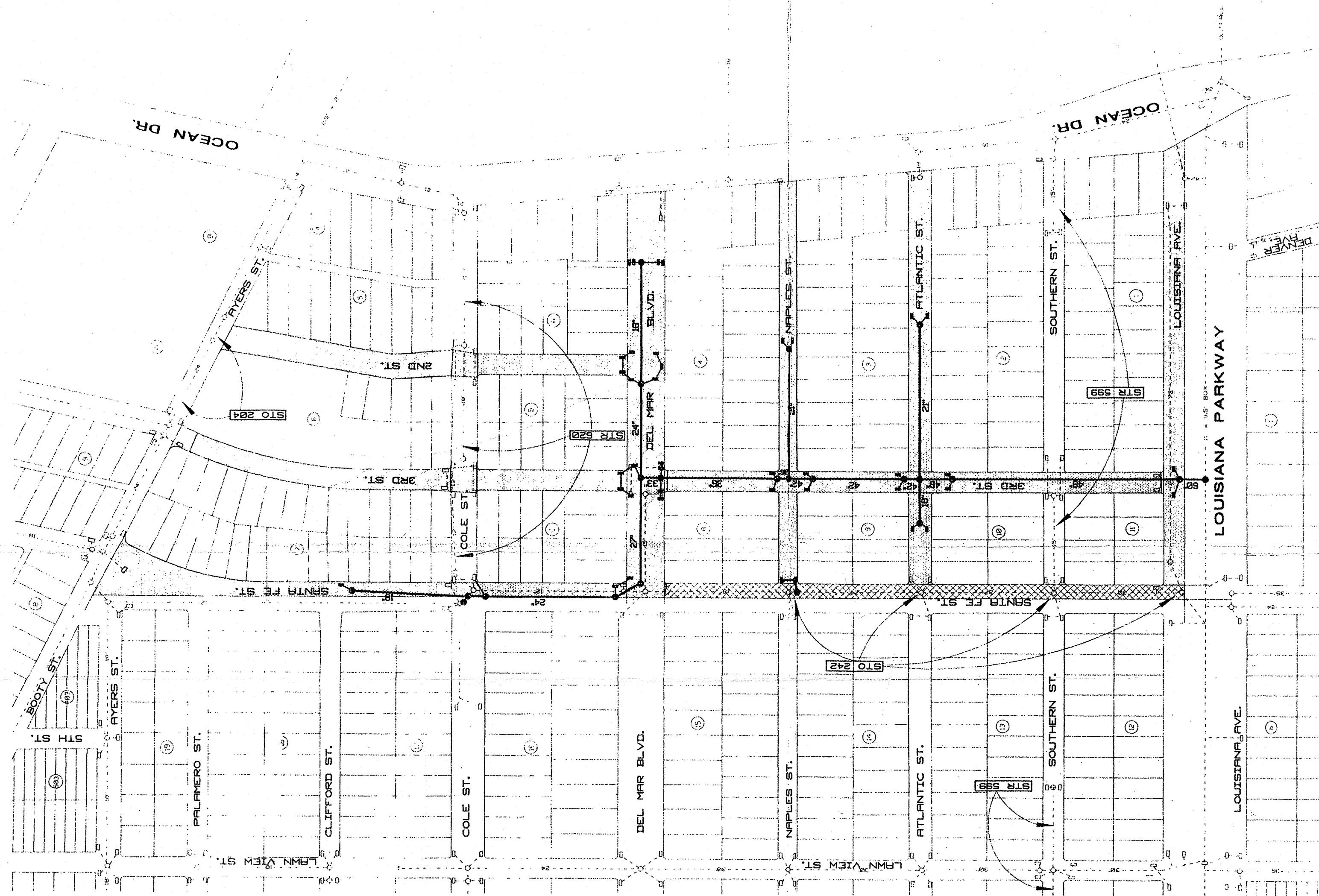
*Handwritten:* 9-27-1969

CITY of CORPUS CHRISTI  
TEXAS  
Department of Engineering Services

DEL MAR AREA STREET  
IMPROVEMENTS PHASE ONE  
BID ALTERNATES  
STORMWATER & SANITARY  
PROP. & EXIST. MAP

SHEET 4B of 52

DRAWING NO:  
STR 710



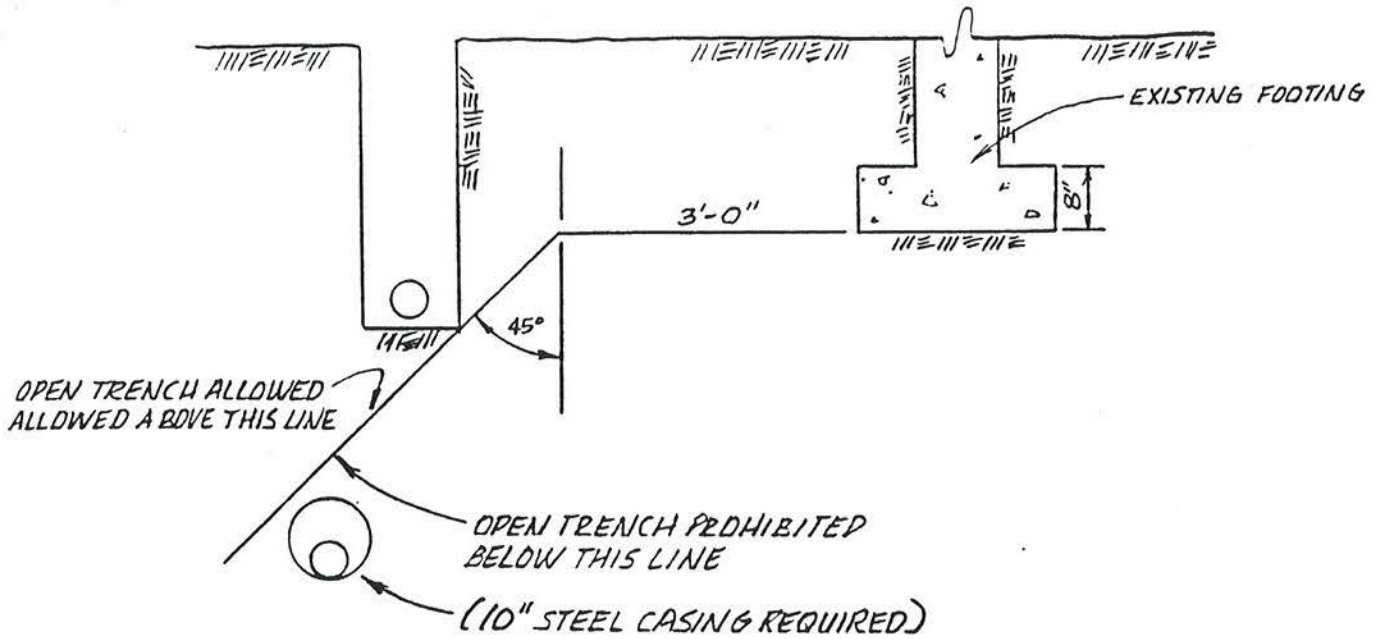
BASE STREET  
AND STORM WATER

ALTERNATE NO.2 STREET  
AND STORM WATER

# STORMWATER PROP. & EXIST. MAP

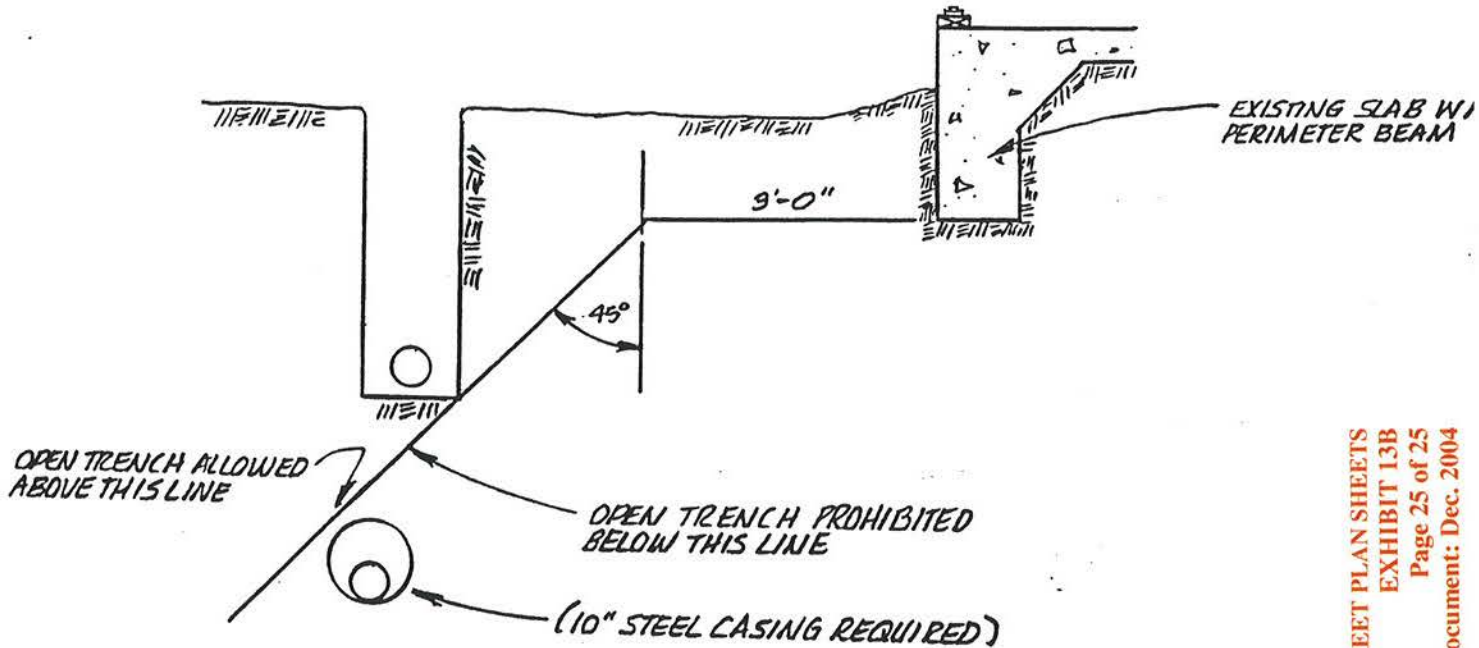
SCALE 1"=200'

# EXHIBIT "C"



## SECTIONS OF PRIVATE SANITARY SERVICE PARALLEL WITH FOUNDATIONS

SCALE = 1/2" = 1'



## SECTIONS OF PRIVATE SANITARY SERVICE PARALLEL WITH FOUNDATIONS

SCALE = 1/2" = 1'

EXHIBIT Q

# **Exhibit 13**

## **c. NEW Sample Contractor Qualification Language for Contract Docs. (OPTIONAL)**

**(Revised December 2004)**



**SURVEILLANCE AND SECURITY SYSTEM**

**SECTION A - SPECIAL PROVISIONS**

**A-1 Time and Place of Receiving Proposals/Pre-Bid Meeting**

Sealed proposals will be received in conformity with the official advertisement inviting bids for the project. Proposals will be received in the office of the City Secretary, located on the first floor of City Hall, 1201 Leopard Street, until 2:00 p.m., Wednesday, August 22, 2001. Proposals mailed should be addressed in the following manner:

City of Corpus Christi  
City Secretary's Office  
1201 Leopard Street  
Corpus Christi, Texas 78401  
ATTN: BID PROPOSAL -

**WESLEY SEALE DAM / CHOKE CANYON DAM / PUMP STATION  
SURVEILLANCE AND SECURITY SYSTEM**

A pre-bid meeting will be held on Tuesday, August 14, 2001, beginning at 9:00a.m. The pre-bid meeting will convene at the Wesley Seale Dam Operations Center, and will include and will include a project overview briefing and tours of the project sites.

No additional or separate visitations will be conducted by the City.

**A-2 Definitions and Abbreviations**

Section B-1 of the General Provisions and Section 01005 will govern. Section 01005 takes precedence over all other sections.

**A-3 Description of Project**

This project consists of construction of a video surveillance and access security system for Wesley Seale Dam, Choke Canyon Dam, the Saltwater Barrier Dam, Woodsboro pump station, and Bloomington pump station. The new system consists of video cameras; video recording, control, switching, and monitoring devices; remote surveillance networking and communications equipment; access security equipment at Wesley Seale Dam; and renovations to Wesley Seale Dam Operations Center; in accordance with the plans, specifications and contract documents.

**A-4 Method of Award**

The bids will be evaluated based on the Statement of Qualifications (as defined in Item A-5) and the Total Base Bid.

The City reserves the right to reject any or all bids, to waive irregularities and to accept the bid which, in the City's opinion, is most advantageous to the City and in the best interest of the public. **THE CITY STAFF AND CITY COUNCIL SHALL EXERCISE ABSOLUTE DISCRETION IN EVALUATING THE ACCEPTABILITY OF THE PROPOSER'S QUALIFICATIONS.**

**A-5 Items to be Submitted with Proposal**

The following items are required to be submitted with the proposal:

1. 5% Bid Bond (Must reference Project Name as identified in the Proposal)

(A Cashier's Check, certified check, money order or bank draft from any State or National Bank will also be acceptable.)

2. Qualification Statement provided with Bid Form. Failure to complete the Qualifications Statement completely and accurately shall be sole cause for the proposal to be considered non-responsive. Proposals with an incomplete Qualifications Statement will not be evaluated and will be rejected as non-responsive.

3. Disclosure of Interests Statement

A-6 Time of Completion/Liquidated Damages

The working time for completion of the Project will be 180 Calendar Days. The Contractor shall commence work within ten (10) calendar days after receipt of written notice from the Director of Engineering Services or designee ("City Engineer") to proceed.

For each calendar day that any work remains incomplete after the time specified in the Contract for completion of the work or after such time period as extended pursuant to other provisions of this Contract, \$250 per calendar day will be assessed against the Contractor as liquidated damages. Said liquidated damages are not imposed as a penalty but as an estimate of the damages that the City will sustain from delay in completion of the work, which damages by their nature are not capable of precise proof. The Director of Engineering Services (City Engineer) may withhold and deduct from monies otherwise due the Contractor the amount of liquidated damages due the City.

A-7 Workers Compensation Insurance Coverage

If the Contractor's workers' compensation insurance coverage for its employees working on the Project is terminated or canceled for any reason, and replacement workers' compensation insurance coverage meeting the requirements of this Contract is not in effect on the effective date of cancellation of the workers' compensation insurance coverage to be replaced, then any Contractor employee not covered by the required workers' compensation insurance coverage must not perform any work on the Project.

Furthermore, for each calendar day including and after the effective date of termination or cancellation of the Contractor's workers' compensation insurance coverage for its employees working on the Project until the date replacement workers' compensation insurance coverage, meeting the requirements of this Contract, is in effect for those Contractor employees, liquidated damages will be assessed against and paid by the Contractor at the highest daily rate elsewhere specified in this Contract. Such liquidated damages will accumulate without notice from the City Engineer to the Contractor and will be assessed and paid even if the permitted time to complete the Project has not expired.

In accordance with other requirements of this Contract, the Contractor shall not permit subcontractors or others to work on the Project unless all such individuals working on the Project are covered by workers' compensation insurance and unless the required documentation of such coverage has been provided to the Contractor and the City Engineer.

A-8 Faxed Proposals

Proposals faxed directly to the City will be considered non-responsive. Proposals must contain original signatures and guaranty and be submitted in accordance with Section B-2 of the General Provisions.

A-9 Acknowledgment of Addenda

The Contractor shall acknowledge receipt of all addenda r  
space provided in the proposal. Failure to do so will be :  
Since addenda can have significant impact on the proposal,

**TOTAL BASE BID**

I	II	III	IV
BID ITEM	QTY & UNIT	DESCRIPTION	TOTAL PRICE IN FIGURES
1.	1 LS	Mobilization and demobilization, complete	\$ _____
2.	1 LS	Surveillance and security system at Wesley Seale Dam, complete	\$ _____
3.	1 LS	Surveillance and security system at Choke Canyon Dam including equipment for remote surveillance from the Wesley Seale Dam Emergency Operations Center, complete	\$ _____
4.	1 LS	Surveillance systems at Saltwater Barrier Dam and the Woodsboro and Bloomington Pump Stations including equipment for remote surveillance from the Wesley Seale Dam Emergency Operations Center, complete	\$ _____
5.	1 LS	Renovations to the Emergency Operations Center at Wesley Seale Dam, complete	\$ _____

**TOTAL BASE BID ITEMS 1 - 5 : \$ \_\_\_\_\_**

**DESCRIPTION OF PAY ITEMS:**

**BASE BID ITEMS**

- I. This item shall consist of the mobilization of personnel, equipment and supplies at the project sites in preparation for beginning work on other contract items and the demobilization of personnel, equipment and supplies from the project sites at the completion of the project. Mobilization shall include, but is not limited to, the movement of equipment, personnel, material, supplies, etc. to the project sites; the establishment of office and other facilities necessary; any preliminary engineering or administrative work performed prior to beginning the work; and permitting. Demobilization shall include, but is not limited to, the removal of equipment, personnel, material, supplies, etc. from the project sites.

Compensation for both mobilization and demobilization shall be included under the lump sum bid item "Mobilization and Demobilization". The amount bid for "Mobilization and Demobilization" shall not exceed ten percent (10%) of the total amount of the BASE BID exclusive of this item. A maximum of one-half of the lump sum cost for mobilization/demobilization shall be paid upon completion of mobilization. The remaining half shall be paid upon complete demobilization from the job site.

2. This item shall consist of providing the surveillance and security system at Wesley Seale Dam, in place complete. The lump sum price shall include, but is not limited to, labor, equipment, materials, dome video cameras, digital video recorder, 48X16 matrix switcher/controller, controller keyboard and joystick, video monitors, fiber optic video and data transceivers, keypad/card readers, intercom, intercom station, fiber optic voice transceiver, magnetic locks, master security controller, remote security controllers, security software, security access rackmount computer, local equipment full-height indoor modular enclosure, cabling, wiring, terminations, pull boxes, startup, programming, commissioning, testing, and training, as indicated on drawings and specifications.

3. This item shall consist of providing the surveillance and security system at Choke Canyon Dam and the system for remote surveillance of Choke Canyon Dam from the Wesley Seale Dam Emergency Operations Center, in place complete. The lump sum price for the surveillance and security system shall include, but is not limited to, labor, equipment, materials, dome video cameras, digital video recorder, 48X16 matrix switcher/controller, controller keyboard and joystick, video monitors, video transmitters and receivers, 2.4 GHz video transmit antennas, 2.4 GHz video receive antennas, data transceivers, 900 MHz omni-directional antenna, 900 MHz directional antennas, entry sensors, alarm radios, full-height indoor modular enclosure, operator desk, cabling, wiring, terminations, pull boxes, startup, programming, commissioning, testing, and training, as indicated on drawings and specifications. The lump sum price shall also include the equipment at Choke Canyon Dam and Wesley Seale Dam that provides the remote surveillance link between the dams consisting of, but not limited to, T1 multiplexers, video encoders, video decoders, video monitors, data modules, PBX end voice module, extension end voice module, network switch, network hub, reservoir supervisor computer station, maintenance laptop computer, remote equipment full-height indoor modular enclosure, cabling, wiring, terminations, startup, programming, commissioning, testing, and training, as indicated on drawings and specifications.
4. This item shall consist of providing the surveillance systems at the Saltwater Barrier Dam, the Woodsboro Pump Station, and the Bloomington Pump Station and the system for remote surveillance of these sites from the Wesley Seale Dam Emergency Operations Center, in place complete. The lump sum price for the surveillance systems shall include, but is not limited to, labor, equipment, materials, dome video cameras, 32X5 matrix switcher/controllers, video monitors, video transmitter, video receiver, 2.4 GHz video transmit antenna, 2.4 GHz video receive antenna, data transceivers, 900 MHz directional antennas, mid-height indoor modular enclosures, outdoor modular enclosure, operator desks, cabling, wiring, terminations, startup, programming, commissioning, testing, and training, as indicated on drawings and specifications. The lump sum price shall also include the equipment at these sites and at Wesley Seale Dam that provides the remote surveillance links between the dams consisting of, but not limited to, video/data IP transceivers, internet routers, surveillance computers, computer monitors, selector switch, cabling, wiring, terminations, startup, programming, commissioning, testing, and training, as indicated on drawings and specifications.
5. This item shall consist of renovations to the Wesley Seale Dam Emergency Operations Center. The lump sum price shall include, but is not limited to, labor, equipment, and materials necessary for demolition, carpentry, replacement of door, repairs to suspended ceiling system, repairs to flooring, painting, furnishings, operator desk, and other furniture as indicated on drawings and specifications.

## STATEMENT OF QUALIFICATIONS

The Contractor, subcontractors, and suppliers shall be qualified and experienced in the performance of the work as described in the Special Provisions, Item A-30. The following statement shall be filled out in order to demonstrate compliance with the qualifications and experience requirements.

All questions must be answered and the data given must be clear and comprehensive. This statement must be notarized and submitted with the proposal. If necessary, questions may be answered on separate attached sheets. Do not attach general advertising and marketing literature; non-related materials will not be considered as part of the proposal. Failure to complete the Qualifications Statement completely and accurately shall be sole cause for the proposal to be considered non-responsive. Proposals with an incomplete Qualifications Statement will not be evaluated and will be rejected.

### COMPANY INFORMATION

1. Name of Proposer: \_\_\_\_\_
2. Permanent main office address and telephone number: \_\_\_\_\_  
\_\_\_\_\_
3. When organized: \_\_\_\_\_ If a corporation, where incorporated: \_\_\_\_\_
4. Contracts on hand: \_\_\_\_\_ (Provide a schedule of these, showing name and address of Owner, amount of each contract and the approximate anticipated dates of completion.)
5. Have you completed all contracts awarded to you? \_\_\_\_ Yes \_\_\_\_ No. If no, submit details.  
\_\_\_\_\_  
\_\_\_\_\_
6. Have you ever defaulted on a contract? \_\_\_\_ If so, where, why, name of project, name and address of the Owner, and name of Bond carrier?  
\_\_\_\_\_  
\_\_\_\_\_
7. Is your firm presently engaged in litigation with respect to any claim regarding contract performance? \_\_\_\_ Yes \_\_\_\_ No. If yes, submit description and state case number, style of case and court in which pending or in which judgment was entered.  
\_\_\_\_\_  
\_\_\_\_\_
8. Has your firm ever been assessed Liquidated Damages on any project? \_\_\_\_ Yes \_\_\_\_ No. If yes, submit details, including the name and address of the owner of the project.  
\_\_\_\_\_  
\_\_\_\_\_
9. Bank Credit available: \$ \_\_\_\_\_ Name of Bank \_\_\_\_\_
10. Attach a copy of your most recent detailed financial statement submitted to a bank for credit and a current detailed financial statement.
11. Have the principals of your firm been engaged in the construction contracting business under any other name within the past five (5) years? If so, please provide the name of such principal(s) and the name and address of the former business.  
\_\_\_\_\_  
\_\_\_\_\_

**WORK PLAN**

Provide below or attach to this sheet a brief statement describing the bidders approach to completing the Work within the specified completion time. Include a bar chart schedule of the major work activities to demonstrate the feasibility of the bidder's approach. Bar chart may be hand written on this sheet or provided on an attached printed page.

**LIST OF SUBCONTRACTORS**

In conformance with the Contract Documents, listed below are the names, addresses, and phone numbers of the subcontractors, and to what extent they will be used if awarded this contract. This list shall not be modified except as requested and approved in writing by the Owner. State if work is to be self performed.

Name and Address of Subcontractor

Type of Work

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

General Electrical Installation

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Installation and commissioning  
of video surveillance system

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Installation and commissioning  
of access security system

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Installation and commissioning  
of computer, networking, and  
telecommunications equipment

# LIST OF SUPPLIERS

In conformance with the Contract Documents, it is required that the names, address, and phone number of the manufacturer and supplier shall be inserted below. Only named manufacturers shall be allowed in the list below. Any manufacturer listed which is not named are grounds for bid rejection.

<u>Item</u>	<u>Manufacturer/Model</u>	<u>Supplier</u>
A. Video Cameras, camera control devices, switching devices, etc.	_____ _____ _____	_____ _____ _____
B. Access security control panels, card readers, keypads, software, etc.	_____ _____ _____	_____ _____ _____
C. Fiber optic video/data transceivers, fiber optic data transceiver	_____ _____ _____	_____ _____ _____
D. Radio frequency video transmitters and receivers, radio frequency data transceivers	_____ _____ _____	_____ _____ _____
E. T1 Multiplexer, data modules, and voice modules.	_____ _____ _____	_____ _____ _____

**EXPERIENCE**

In conformance with the contract documents, provide information demonstrating compliance with the experience requirements:

**GENERAL ELECTRICAL CONSTRUCTION**

Experience No. 1

Project Name: \_\_\_\_\_

Description: \_\_\_\_\_

Location: \_\_\_\_\_

Owner: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Current Phone Number: \_\_\_\_\_

Month / Year substantially Complete: \_\_\_\_\_

Experience No. 2

Project Name: \_\_\_\_\_

Description: \_\_\_\_\_

Location: \_\_\_\_\_

Owner: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Current Phone Number: \_\_\_\_\_

Month / Year substantially Complete: \_\_\_\_\_

Experience No. 3

Project Name: \_\_\_\_\_

Description: \_\_\_\_\_

Location: \_\_\_\_\_

Owner: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Current Phone Number: \_\_\_\_\_

Month / Year substantially Complete: \_\_\_\_\_



**EXPERIENCE (Cont.)**

**INSTALLATION AND COMMISSIONING OF VIDEO SURVEILLANCE SYSTEMS**

Experience No. 1

Project Name: \_\_\_\_\_

Description: \_\_\_\_\_

Equipment Manufacturer and Model: \_\_\_\_\_

Location: \_\_\_\_\_

Owner: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Current Phone Number: \_\_\_\_\_

Month / Year substantially Complete: \_\_\_\_\_

Experience No. 2

Project Name: \_\_\_\_\_

Description: \_\_\_\_\_

Equipment Manufacturer and Model: \_\_\_\_\_

Location: \_\_\_\_\_

Owner: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Current Phone Number: \_\_\_\_\_

Month / Year substantially Complete: \_\_\_\_\_

Experience No. 3

Project Name: \_\_\_\_\_

Description: \_\_\_\_\_

Equipment Manufacturer and Model: \_\_\_\_\_

Location: \_\_\_\_\_

Owner: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Current Phone Number: \_\_\_\_\_

Month / Year substantially Complete: \_\_\_\_\_

**EXPERIENCE (Cont.)**

**INSTALLATION AND COMMISSIONING OF ACCESS SECURITY SYSTEMS**

Experience No. 1

Project Name: \_\_\_\_\_

Description: \_\_\_\_\_

Equipment Manufacturer and Model: \_\_\_\_\_

Location: \_\_\_\_\_

Owner: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Current Phone Number: \_\_\_\_\_

Month / Year substantially Complete: \_\_\_\_\_

Experience No. 2

Project Name: \_\_\_\_\_

Description: \_\_\_\_\_

Equipment Manufacturer and Model: \_\_\_\_\_

Location: \_\_\_\_\_

Owner: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Current Phone Number: \_\_\_\_\_

Month / Year substantially Complete: \_\_\_\_\_

Experience No. 3

Project Name: \_\_\_\_\_

Description: \_\_\_\_\_

Equipment Manufacturer and Model: \_\_\_\_\_

Location: \_\_\_\_\_

Owner: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Current Phone Number: \_\_\_\_\_

Month / Year substantially Complete: \_\_\_\_\_

**EXPERIENCE (Cont.)**

**INSTALLATION AND COMMISSIONING OF NETWORKING AND TELECOMMUNICATIONS EQUIPMENT**

Experience No. 1

Project Name: \_\_\_\_\_

Description: \_\_\_\_\_

Equipment Manufacturer and Model: \_\_\_\_\_

Location: \_\_\_\_\_

Owner: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Current Phone Number: \_\_\_\_\_

Month / Year substantially Complete: \_\_\_\_\_

Experience No. 2

Project Name: \_\_\_\_\_

Description: \_\_\_\_\_

Equipment Manufacturer and Model: \_\_\_\_\_

Location: \_\_\_\_\_

Owner: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Current Phone Number: \_\_\_\_\_

Month / Year substantially Complete: \_\_\_\_\_

Experience No. 3

Project Name: \_\_\_\_\_

Description: \_\_\_\_\_

Equipment Manufacturer and Model: \_\_\_\_\_

Location: \_\_\_\_\_

Owner: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Current Phone Number: \_\_\_\_\_

Month / Year substantially Complete: \_\_\_\_\_

PROPOSAL FORM  
FOR

WASTEWATER MICROWAVE COMMUNICATION SYSTEM

DEPARTMENT OF ENGINEERING SERVICES

CITY OF CORPUS CHRISTI, TEXAS

P R O P O S A L

Place:

Date: \_\_\_\_\_

Proposal of \_\_\_\_\_,

a Corporation organized and existing under the laws of the  
State of \_\_\_\_\_.

OR

a Partnership or Individual doing business as  
\_\_\_\_\_  
\_\_\_\_\_.

TO: The City of Corpus Christi, Texas

Gentlemen:

The undersigned hereby proposes to furnish all labor and materials, tools, and necessary equipment, and to perform the work required for:

**WASTEWATER MICROWAVE COMMUNICATION SYSTEM**

at the locations set out by the plans and specifications and in strict accordance with the contract documents for the following prices, to-wit:

**SAMPLE CONTRACTOR  
QUALIFICATION LANGUAGE  
EXHIBIT 13C  
Page 13 of 28  
New Document: Dec. 2004**

TOTAL BASE BID

I	II	III	IV
BID ITEM	QTY & UNIT	DESCRIPTION	TOTAL PRICE IN FIGURES
1.	1 LS	SCADA System: This project consists of replacing existing wastewater monitoring and alarm system for 87 lift stations and 6 wastewater treatment plants with a new Supervisory Control and Data Acquisition (SCADA) system consisting of RTUs, new radio communication system, and Day/Night Master sites with Graphic HMI systems.	\$ _____
2.	1 LS	SCADA documentation and training complete in place per lump sum.	\$ _____

TOTAL BASE BID: \$ \_\_\_\_\_

**STATEMENT OF QUALIFICATIONS**

The Contractor, subcontractors, and suppliers shall be qualified and experienced in the performance of the work as described in the Special Provisions, Item A-30. The following statement shall be filled out in order to demonstrate compliance with the qualifications and experience requirements.

All questions must be answered and the data given must be clear and comprehensive. This statement must be notarized and submitted with the proposal. If necessary, questions may be answered on separate attached sheets. Do not attach general advertising and marketing literature; non-related materials will not be considered as part of the proposal. Failure to complete the Qualifications Statement completely and accurately shall be sole cause for the proposal to be considered non-responsive. Proposals with an incomplete Qualifications Statement will not be evaluated and will be rejected.

**COMPANY INFORMATION**

- 1. Name of Proposer: \_\_\_\_\_
  
- 2. Permanent main office address and telephone number:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
  
- 3. When organized: \_\_\_\_\_ If a corporation, where incorporated: \_\_\_\_\_
  
- 4. Contracts on hand: \_\_\_\_\_ (Provide a schedule of these, showing name and address of Owner, amount of each contract and the approximate anticipated dates of completion.)
  
- 5. Have you completed all contracts awarded to you? \_\_\_\_\_ (Yes / No) If no, submit details.  
\_\_\_\_\_  
\_\_\_\_\_
  
- 6. Have you ever defaulted on a contract? \_\_\_\_\_ (Yes / No) if so, where, why, name of project, name and address of the Owner, and name of Bond carrier?  
\_\_\_\_\_  
\_\_\_\_\_

7. Is your firm presently engaged in litigation with respect to any claim regarding contract performance? \_\_\_\_\_ (Yes / No). If yes, submit description and state case number, style of case and court in which pending or in which judgment was entered.

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8. Has your firm ever been assessed Liquidated Damages on any project? \_\_\_\_\_ (Yes / No). If yes, submit details, including the name and address of the owner of the project.

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9. Bank Credit available: \$ \_\_\_\_\_ Name of Bank \_\_\_\_\_

10. Attach a copy of your most recent detailed financial statement submitted to a bank for credit and a current detailed financial statement.

11. Have the principals of your firm been engaged in the construction contracting business under any other name within the past five (5) years? If so, please provide the name of such principal(s) and the name and address of the former business.

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**WORK PLAN**

Provide attach to this proposal a brief statement describing the bidders approach to completing the Work within the specified completion time. Include a bar chart schedule of the major work activities to demonstrate the feasibility of the bidder's approach. Bar chart may be hand written or an attached printed page.

**Contractor Organization:**

The Contractor/subcontractor must have demonstrated technical expertise, experience, and resources to provide a complete project. Project experience listed should be that which is similar to the type, size, and scope of this project and utilizes similar hardware and software functionality listed in the contract documents. The SCADA Contractor shall furnish the following information:



**Contractor Organization (cont.):**

a) Name and address of SCADA Contractor:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

b) Project Team: Provide resumes for the project team members including education, years of experience, and related experience. Any changes to the project team shall be subject to the Engineer's approval.

Project Manager \_\_\_\_\_  
System Engineer \_\_\_\_\_  
Software Engineer \_\_\_\_\_  
Start-up Engineer \_\_\_\_\_  
Field Services \_\_\_\_\_

c) Does SCADA Contractor have a minimum of five years of related experience? \_\_\_\_\_ (Yes/No)  
List years of experience \_\_\_\_\_

d) SCADA Contractor maximum approved bonding limit. (Minimum one million dollars) \$ \_\_\_\_\_

d) SCADA Contractor liability insurance limit. (Minimum one million dollars) \$ \_\_\_\_\_

d) SCADA Contractor five-year average gross sales. \$ \_\_\_\_\_

h) List SCADA contractor number of project managers \_\_\_\_\_

i) List SCADA contractor number of system engineers \_\_\_\_\_

j) List SCADA contractor number of programmers. \_\_\_\_\_

k) List three similar SCADA systems supplied within the past five years, the primary function of which is to control and monitor water and/or wastewater facilities:

PROJECT NO. 1

Owner Name: \_\_\_\_\_

Location: \_\_\_\_\_

Contact Name \_\_\_\_\_

Phone Number \_\_\_\_\_

Project Manager \_\_\_\_\_

System Cost \_\_\_\_\_

Award Date \_\_\_\_\_ Acceptance Date \_\_\_\_\_

Manufacturer/Model PLCs \_\_\_\_\_

Software Package \_\_\_\_\_

Give quantities for the following:

WTPs \_\_\_\_\_ WWTPs \_\_\_\_\_ Pumping Station \_\_\_\_\_ Reservoirs \_\_\_\_\_

PLCs \_\_\_\_\_ HMIs \_\_\_\_\_ Master Sites \_\_\_\_\_ Repeaters \_\_\_\_\_

Was Project Late: \_\_\_\_\_ (Yes / No) (If yes, explain)

PROJECT NO. 2

Owner Name: \_\_\_\_\_

Location: \_\_\_\_\_

Contact Name \_\_\_\_\_

Phone Number \_\_\_\_\_

Project Manager \_\_\_\_\_

System Cost \_\_\_\_\_

Award Date \_\_\_\_\_ Acceptance Date \_\_\_\_\_

Manufacturer/Model PLCs \_\_\_\_\_

Software Package \_\_\_\_\_

Give quantities for the following:

WTPs \_\_\_\_\_ WWTPs \_\_\_\_\_ Pumping Station \_\_\_\_\_ Reservoirs \_\_\_\_\_

PLCs \_\_\_\_\_ HMIs \_\_\_\_\_ Master Sites \_\_\_\_\_ Repeaters \_\_\_\_\_

Was Project Late: \_\_\_\_\_ (Yes / No) (If yes, explain)

PROJECT NO. 3

Owner Name: \_\_\_\_\_

Location: \_\_\_\_\_

Contact Name \_\_\_\_\_

Phone Number \_\_\_\_\_

Project Manager \_\_\_\_\_

System Cost \_\_\_\_\_

Award Date \_\_\_\_\_ Acceptance Date \_\_\_\_\_

Manufacturer/Model PLCs \_\_\_\_\_

Software Package \_\_\_\_\_

Give quantities for the following:

WTPs \_\_\_\_\_ WWTPs \_\_\_\_\_ Pumping Station \_\_\_\_\_ Reservoirs \_\_\_\_\_

PLCs \_\_\_\_\_ HMIs \_\_\_\_\_ Master Sites \_\_\_\_\_ Repeaters \_\_\_\_\_

Was Project Late: \_\_\_\_\_ (Yes / No) (If yes, explain)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**LIST OF SUPPLIERS**

In conformance with the Contract Documents, it is required that the names, address, and phone number of the manufacturer and supplier shall be inserted below. Only named manufacturers shall be allowed in the list below. Any manufacturer listed that is not named is grounds for bid rejection.

<u>Item</u>	<u>Manufacturer/Model/Supplier</u>
A. Radio Transceivers	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
B. Programmable Logic Controllers	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
C. Human Machine Interface	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>

**LIST OF SUBCONTRACTORS**

In conformance with the Contract Documents, listed below are the names, addresses, and phone numbers of the subcontractors, and to what extent they will be used if awarded this contract. This list shall not be modified except as requested and approved in writing by the Owner. State if work is to be self performed.

<u>Name and Address of Subcontractor</u>	<u>Type of Work</u>
<hr/> <hr/> <hr/> <hr/> <hr/>	General Electrical Installation
<hr/> <hr/> <hr/> <hr/> <hr/>	Installation of wireless communication systems
<hr/> <hr/> <hr/> <hr/> <hr/>	Installation of networking systems
<hr/> <hr/> <hr/> <hr/> <hr/>	Installation and commissioning of HMI systems

**EXPERIENCE**

In conformance with the contract documents Section 'A' Special Provisions paragraphs A-5.2 & A-30, provide information demonstrating compliance with the experience requirements:

**EXPERIENCE (Cont.)**

GENERAL ELECTRICAL CONSTRUCTION

Experience No. 1

Project Name: \_\_\_\_\_

Description: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Location: \_\_\_\_\_

Owner: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Current Phone Number: \_\_\_\_\_

Month / Year substantially Complete: \_\_\_\_\_

Experience No. 2

Project Name: \_\_\_\_\_

Description: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Location: \_\_\_\_\_

Owner: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Current Phone Number: \_\_\_\_\_

Month / Year substantially Complete: \_\_\_\_\_

Experience No. 3

Project Name: \_\_\_\_\_

Description: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Location: \_\_\_\_\_

Owner: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Current Phone Number: \_\_\_\_\_

Month / Year substantially Complete: \_\_\_\_\_

**EXPERIENCE (Cont.)**

INSTALLATION AND COMMISSIONING OF WIRELESS COMMUNICATION SYSTEMS

Experience No. 1

Project Name: \_\_\_\_\_

Description: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Location: \_\_\_\_\_

Owner: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Current Phone Number: \_\_\_\_\_

Month / Year substantially Complete: \_\_\_\_\_

Experience No. 2

Project Name: \_\_\_\_\_

Description: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Location: \_\_\_\_\_

Owner: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Current Phone Number: \_\_\_\_\_

Month / Year substantially Complete: \_\_\_\_\_

Experience No. 3

Project Name: \_\_\_\_\_

Description: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Location: \_\_\_\_\_

Owner: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Current Phone Number: \_\_\_\_\_

Month / Year substantially Complete: \_\_\_\_\_

**EXPERIENCE (Cont.)**

INSTALLATION AND COMMISSIONING OF NETWORKING SYSTEMS

Experience No. 1

Project Name: \_\_\_\_\_

Description: \_\_\_\_\_

\_\_\_\_\_

Location: \_\_\_\_\_

Owner: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Current Phone Number: \_\_\_\_\_

Month / Year substantially Complete: \_\_\_\_\_

Experience No. 2

Project Name: \_\_\_\_\_

Description: \_\_\_\_\_

\_\_\_\_\_

Location: \_\_\_\_\_

Owner: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Current Phone Number: \_\_\_\_\_

Month / Year substantially Complete: \_\_\_\_\_

Experience No. 3

Project Name: \_\_\_\_\_

Description: \_\_\_\_\_

\_\_\_\_\_

Location: \_\_\_\_\_

Owner: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Current Phone Number: \_\_\_\_\_

Month / Year substantially Complete: \_\_\_\_\_



**EXPERIENCE (Cont.)**

INSTALLATION AND COMMISSIONING OF HMI SYSTEMS

Experience No. 1

Project Name: \_\_\_\_\_

Description: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Location: \_\_\_\_\_

Owner: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Current Phone Number: \_\_\_\_\_

Month / Year substantially Complete: \_\_\_\_\_

Experience No. 2

Project Name: \_\_\_\_\_

Description: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Location: \_\_\_\_\_

Owner: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Current Phone Number: \_\_\_\_\_

Month / Year substantially Complete: \_\_\_\_\_

Experience No. 3

Project Name: \_\_\_\_\_

Description: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Location: \_\_\_\_\_

Owner: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Current Phone Number: \_\_\_\_\_

Month / Year substantially Complete: \_\_\_\_\_

The undersigned hereby declares that he has visited the site and has carefully examined the plans, specifications and contract documents relating to the work covered by his bid or bids, that he agrees to do the work, and that no representations made by the City are in any sense a warranty but are mere estimates for the guidance of the Contractor.

Upon notification of award of contract, we will within ten (10) calendar days execute the formal contract and will deliver a Performance Bond (as required) for the faithful performance of this contract and a Payment Bond (as required) to insure payment for all labor and materials.

The bid bond attached to this proposal, in the amount of 5% of the highest amount bid, is to become the property of the City of Corpus Christi in the event the contract and bonds are not executed within the time above set forth as liquidated damages for the delay and additional work caused thereby.

**Minority/Minority Business Enterprise Participation:** The apparent low bidder shall, within five days of receipt of bids, submit to the City Engineer, in writing, the names and addresses of MBE firms participating in the contract and a description of the work to be performed and its dollar value for bid evaluation purpose.

**Number of Signed Sets of Documents:** The contract and all bonds will be prepared in not less than four counterpart (original signed) sets.

**Time of Completion:** The undersigned agrees to complete the work within 365 calendar days from the date designated by a Work Order.

The undersigned further declares that he will provide all necessary tools and apparatus, do all the work and furnish all materials and do everything required to carry out the above mentioned work covered by this proposal, in strict accordance with the contract documents and the requirements pertaining thereto, for the sum or sums above set forth.

Receipt of the following addenda is acknowledged (addenda number): \_\_\_\_\_

Respectfully submitted:

Name: \_\_\_\_\_

By: \_\_\_\_\_

(SIGNATURE)

(SEAL - IF BIDDER IS  
a Corporation)

Address: \_\_\_\_\_

(P.O. Box) (Street)

(City) (State) (Zip)

Telephone: \_\_\_\_\_

**NOTE:** Do not detach bid from other papers.  
Fill in with ink and submit complete  
with attached papers.

**SAMPLE CONTRACTOR  
QUALIFICATION LANGUAGE  
EXHIBIT 13C  
Page 26 of 28  
New Document: Dec. 2004**

**CITY OF CORPUS CHRISTI  
DISCLOSURE OF INTERESTS**

City of Corpus Christi Ordinance 17112, as amended, requires all persons or firms seeking to do business with the City to provide the following information. Every question must be answered. If the question is not applicable, answer with "NA".

**FIRM NAME:** \_\_\_\_\_

**STREET:** \_\_\_\_\_ **CITY:** \_\_\_\_\_ **ZIP:** \_\_\_\_\_

**FIRM is:** 1. Corporation                      2. Partnership                      3. Sole Owner                      4. Association  
5. Other \_\_\_\_\_

**DISCLOSURE QUESTIONS**

If additional space is necessary, please use the reverse side of this page or attach separate sheet.

**1. State the names of each "employee" of the City of Corpus Christi having an "ownership interest" constituting 3% or more of the ownership in the above named "firm".**

Name	Job Title and City Department (if known)
_____	_____
_____	_____

**2. State the names of each "official" of the City of Corpus Christi having an "ownership interest" constituting 3% or more of the ownership in the above named "firm".**

Name	Title
_____	_____
_____	_____

**3. State the names of each "board member" of the City of Corpus Christi having an "ownership interest" constituting 3% or more of the ownership in the above named "firm".**

Name	Board, Commission or Committee
_____	_____
_____	_____

**4. State the names of each employee or officer of a "consultant" for the City of Corpus Christi who worked on any matter related to the subject of this contract and has an "ownership interest" constituting 3% or more of the ownership in the above named "firm".**

Name	Consultant
_____	_____
_____	_____

**CERTIFICATE**

I certify that all information provided is true and correct as of the date of this statement, that I have not knowingly withheld disclosure of any information requested; and that supplemental statements will be promptly submitted to the City of Corpus Christi, Texas as changes occur.

**Certifying Person:** \_\_\_\_\_ **Title:** \_\_\_\_\_  
(Type or Print)

**Signature of Certifying Person:** \_\_\_\_\_ **Date:** \_\_\_\_\_

## DEFINITIONS

- a. "Board Member". A member of any board, commission or committee appointed by the City Council of the City of Corpus Christi, Texas.
- b. "Employee". Any person employed by the City of Corpus Christi, Texas, either on a full or part time basis, but not as an independent contractor.
- c. "Firm". Any entity operated for economic gain, whether professional, industrial or commercial and whether established to produce or deal with a product or service, including but not limited to, entities operated in the form of sole proprietorship, as self-employed person, partnership, corporation, joint stock company, joint venture, receivership or trust and entities which, for purposes of taxation, are treated as non-profit organizations.
- d. "Official". The Mayor, members of the City Council, City Manager, Deputy City Manager, Assistant City Managers, Department and Division Heads and Municipal Court Judges of the City of Corpus Christi, Texas.
- e. "Ownership Interest". Legal or equitable interest, whether actually or constructively held, in a firm, including when such interest is held through an agent, trust, estate or holding entity. "Constructively held" refers to holding or control established through voting trusts, proxies or special terms of venture or partnership agreements.
- f. "Consultant". Any person or firm, such as engineers and architects, hired by the City of Corpus Christi for the purpose of professional consultation and recommendation.

# **Exhibit 13**

## **d. NEW Sample A/E's**

### **Letter to (3) Apparent Low**

#### **Bidders**

**(Revised December 2004)**



**City of  
Corpus  
Christi**

August 16, 2001

**Consulting Engineers:**

**Turner Engineers, Inc.**  
1225 Agnes Blvd., Ste. 110  
Corpus Christi, Texas 78401  
361-882-9990 Fax 882-9998

Weathertrol, Inc.  
P. O. Box 4881  
Corpus Christi, Texas 78404

**RE: City Hall Cooling Towers Repairs -- 2001  
Project No. 4242**

Dear Sirs,

At the public bid opening conducted by the Engineering Services Department of the City of Corpus Christi at 2:00 p.m. on August 15, 2001, your company was one of the three lowest bidders for the construction work proposed under the referenced project.

The solicitation Special Provisions and Technical Specifications both require the submission of additional information. Specifically, Special Provisions paragraphs A-28, A-29, A-30 and A-51 have several questions that require a response: additionally, Specification 125000, part 3 also contains early submittal requirements, to assist the City in making a determination on the award to the lowest, responsive bidder.

Per the contract solicitation, we request that you provide the required information to the Engineering Services Department, Attention Sylvia Arriaga, within 5 working days of the bid opening. I appreciate your prompt submission, and thank you for your proposal.

Sincerely,

Jim Ward  
Turner Engineers, Inc.

Copy: Joe Trejo  
fax 880-3501  
Sylvia Arriaga  
fax 880-3501

Engineering Services  
P.O. Box 9277 · Corpus Christi, Texas 78469-9277 · (361) 880-3500

SAMPLE A/E'S LETTER TO 3  
APPARENT LOW BIDDER'S  
EXHIBIT 13D  
Page 1 of 2  
New Document: Dec. 2004

June 20, 2001

Sal-Con Inc.  
P.O. Box  
Corpus Christi, Tx 78405



MORGAN  
SPEAR  
ASSOCIATES  
INC  
ARCHITECTS  
PLANNERS

Re: Frost Bank Lease Space Remodel  
Re-Bid Project No. 4201

225  
S. CARANCAHUA  
CORPUS  
CHRISTI,  
TEXAS  
78401

Dear Sirs:

PHONE  
361-883-5588  
FAX 361-883-9204

At the public bid opening conducted by the Engineering services Department of the City of Corpus Christi at 2:00 p.m. on June 20, your company was one of the three lowest bidders for the construction work proposed under the referenced project.

The solicitation Special Provisions and Technical Specification both require submission of additional information. Specifically, Special Provision paragraphs A-28, A29, A-30 and A-51 have several questions that require a response; additionally, Specification 15000, part 3 also contains early submittal requirements, to assist the City in making a determination on the award to the lowest, responsive bidder.

Per the contract solicitation, provide the requested information to the Engineering Services Department, Attention Sylvia Arriaga, **within 5 working days** of the bid opening. I appreciate you prompt submission, and thank you for your proposal.

Sincerely,  
Morgan Spear Associates, Inc.

Morgan Spear, President

CC: Joe Trejo - Mng Proj En  
Sylvia Arriaga - Contract Admin  
- Director of Eng

SAMPLE A/E'S LETTER TO 3  
APPARENT LOW BIDDER'S  
EXHIBIT 13D  
Page 2 of 2  
New Document: Dec. 2004

# **Exhibit 13**

## **e. NEW Elements of a Design Memorandum**

**(Revised December 2004)**



# ELEMENTS OF DESIGN MEMORANDUM

## I. Executive Summary (must address major elements)

- Project Description
- Purpose and Objective of Study
- Description of Main deficiencies
- Discussion Alternatives/Options
- Recommendation for Proposed Improvements / Final Opinion of Probable Construction Costs / Project Construction Time Line / Construction Phasing
- Gantt Chart for Schedule / Time Line for Proposed Improvements
- Location / Vicinity Map Exhibit
- Aerial Photo

## II. Introduction:

- Scope of Work
- Results and Finding of Preliminary Investigation
- Review of Existing Public / Private Utilities / Area Characteristics
  - Conditions / Access / Soils / Flood Zones
  - Implications to Project
  - Background Information and Names of the Agencies contacted
  - Photos
- Relocation of Utilities / R.O.W. needs that may impact schedule
- Cross-Sections
- Regulatory Requirements / Permits / Easements / Archeological -or- Historic Considerations / Environmental Considerations / R.O.W. / MS4 Impacts
- Impacts to Public / Private Facilities & Services
  - Schools
  - Postal Services
  - R T A
  - Emergency Vehicles
  - Solid Waste
  - Underground Utilities
- Special Commissions / Agencies / Public Presentations

## III. Proposed Improvements

### 1. Design Basis:

- Street/Roadway:
  - ADA / TAS
  - MTP Compliance
  - Geotechnical
  - Street Classification
  - Anticipated Traffic / T. I. P.
  - Subgrade & Existing Site Conditions
  - Pavement Design (Load Calculation) / Equivalent Axle Loading
  - Recommended Pavement Section(s) / Alternatives
  - Traffic Signals
  - Pavement Markings
  - R.O.W. Requirements
  - Easement Requirements

- Storm Drainage:
  - Compliance with Master Plans
  - Geotechnical
  - Photos
  - Drainage Basin and Adjacent Boundaries
  - Hydraulic Analysis / Results
  - Level of Protection on Storm Event (5 yr, 25 yr, 100 yr)
  - Existing Limitations that Impact Design
  - Impacts to Designated Outfall / Hydraulic Gradient
  - Base Maps / Schematics
  - Environmental Issues / Permit Requirements
  - Cross-Sections
  - Recommendations (detailed with pro's and con's and alternative)
  
- Sanitary Sewer:
  - Compliance with Master Plan(s)
  - Geotechnical
  - Photos
  - Basin Area and Adjacent Boundaries
  - Hydraulic Capacity
  - Area Schematic / Base Maps
  - Cross-Sections
  - Existing Limitations that Impact Design
  - Groundwater / Wellpointing Issues
  - Recommendations (detailed with pro's and con's and alternative)
  
- Water System
  - Compliance with Master Plan
  - Geotechnical
  - Photos
  - Relationship with Grid System
  - System Schematic / Basemaps
  - Service Requirements
  - Fire protection
  - Existing Limitations that Impact Design
  - Cross-Sections
  - Environmental Issues / Penalties / Regulations
  - Recommendations (detailed with pro's and con's and alternative)

2. Agency Approval Requirements  
(GLO/USACE/TCEQ/TDLR/RR)

- Historical
- Environmental
- Land Uses
- Traffic Condition
- TDLR Accessibility
- Other

3. Easement and Right-of-Way Requirements

- Existing
- Proposed
- Issues

#### 4. Construction Sequencing

- Major Activities
- Construction Sequence
- Traffic Control
- Recommendations/Alternative

#### IV. Opinion of Probable Construction Cost of the Proposed Improvements:

- Required Improvements
- Alternatives
- Recommendation

#### V. Geotechnical Study

#### VI. Schedule(s)

- Design
- Public Meetings
- Land Acquisition
- Permitting
- Construction

#### VII. Design Calculations

#### VIII. Exhibits

- Area and Location Map(s)
- Copy of the Master Plan Area that is applicable to the design
- Proposed Layout and Alternate Route(s)
- Typical Cross Sections
- Photograph (must include the aerial photograph)
- Permit Exhibits
- Other exhibits necessary for project design
- Existing Easements / Ownership / Plats / Land Use
- Utility Base Maps

# **Exhibit 13**

## **f. NEW Sample Citizen**

### **Meeting Format**

**(Revised December 2004)**

## **Citizen Meetings for Street Projects**

### 1. Prior to Completion of Design--Assessment Projects

#### A. Project Fact Sheet:

- Project Limits
- Project Description
- ROW Acquisition
- Scope of Improvements
- Funding
- Construction Sequencing
- Time Schedule

#### B. Typical Questions and Answers

- Driveways
- Fences
- Trees
- Street Lighting
- Assessments

#### C. Comment Form To be Mailed In

#### D. Attendance Roster

#### E. Exhibits

- Cross Section
- Plan and Profile sheets
- Preliminary Assessment Roll

### 2. Post Completion of Design and After Award--Overlay Projects

Same as Above But More Detail on Construction Sequencing

# **ATTENTION**

The City of Corpus Christi  
will hold a

Neighborhood Pre-Construction Meeting

on

**WEDNESDAY, JANUARY 24, 2001**

**6:00 P.M. - 7:30 P.M.**

**EMERGENCY SHELTER AND ASSESSMENT CENTER**

**721 Omaha**

concerning

## **OMAHA DRIVE IMPROVEMENTS**

Between I.H. 37 and Leopard Street

The project consists of the removal and replacement of 8-inch and 24-inch water mains and 8-inch sanitary sewer lines and service connections to individual customers. Existing storm sewer pipes, inlets and culverts will be replaced with a new storm sewer system on Omaha Drive and on nearby Leopard Street. Pavement, driveways, earthwork, paving base, walks and fences will be replaced in conjunction with construction of a new 28-foot back-of-curb to back-of-curb street between Leopard Street and I. H. 37. The project includes concrete curb and gutter, sidewalks and driveways, caliche base, lime stabilized sub-grade and other work required to complete the project.

The City Department of Engineering Services and the Contractor for this project, Asphalt Paving and Construction Company, (APCCO) will review the scope of improvements, time schedule and construction sequence for this project. Construction is scheduled to start by mid-February, 2001.

**YOU ARE INVITED TO ATTEND THIS MEETING AND  
LEARN ABOUT THE PROJECT**

For Information Call

Mary Frances Teniente, P.E. Design Engineer  
880-3807

**SAMPLE CITIZEN MEETING FORMAT  
SAMPLE MEETING NOTICE  
EXHIBIT 13F  
Page 2 of 3**

**CITIZENS COMMENTS**

**OMAHA DRIVE IMPROVEMENTS**

NEIGHBORHOOD PRE-CONSTRUCTION MEETING (1/24/01)

NAME:

\_\_\_\_\_

ADDRESS:

\_\_\_\_\_

TELEPHONE NO.: \_\_\_\_\_ FAX: \_\_\_\_\_

1. Are you representing your own individual interests or the interests of an organization? If affiliated with an organization, please indicate the name of the organization.

\_\_\_\_\_

2. What are the questions, issues or concerns you have about the project?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. Please provide any additional comments you think we should consider on this project that were not addressed.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

For additional information, you may contact Mary Frances Teniente, P.E. of the City of Corpus Christi, at (361) 880-3500

# **Exhibit 13**

## **g. NEW Typical Traffic**

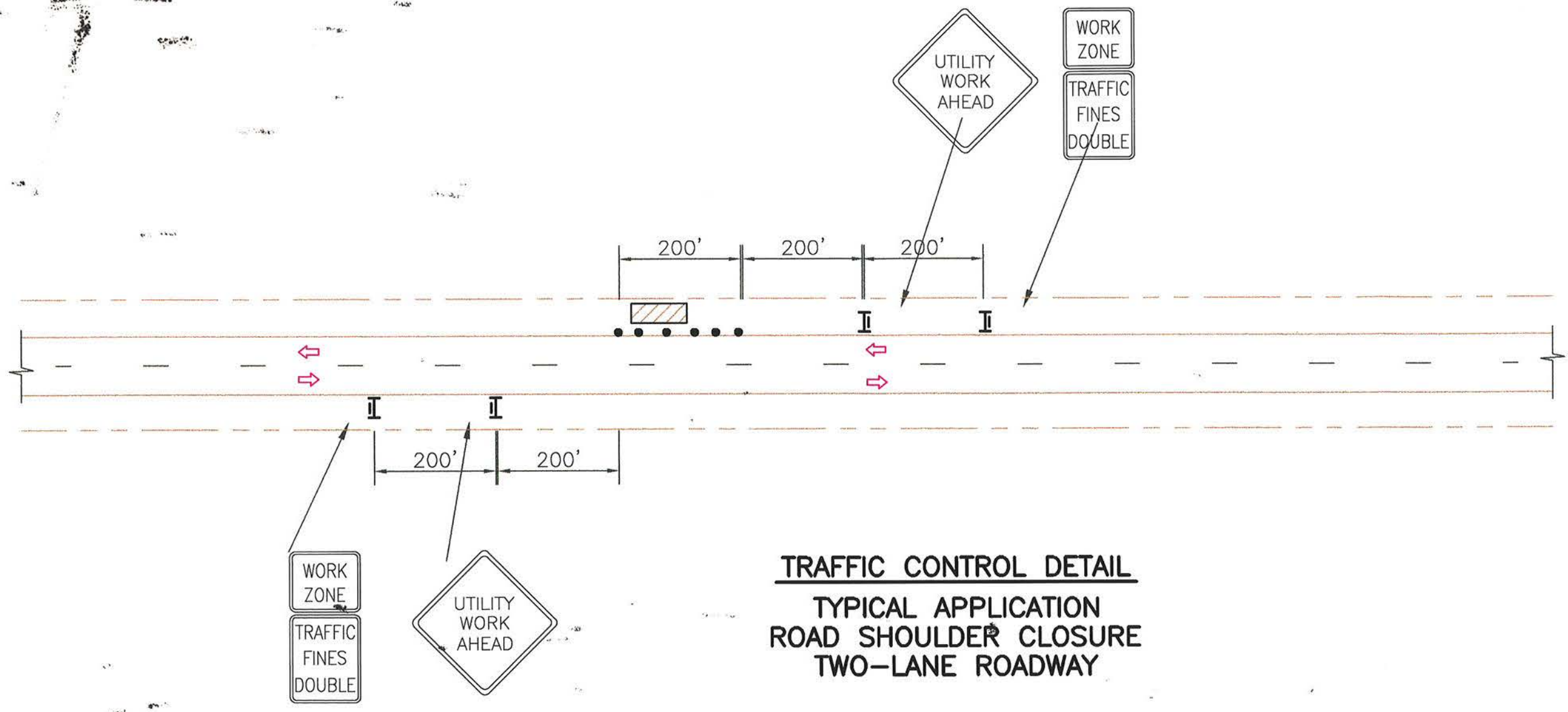
### **Control Details**

**(Revised December 2004)**

**FOR GUIDANCE ONLY—JOB-SPECIFIC, MUST BE**

**SUBMITTED AND SEALED BY A/E**













**TRAFFIC CONTROL DETAIL**  
**TYPICAL APPLICATION**  
**ROAD SHOULDER CLOSURE**  
**TWO-LANE ROADWAY**

**NOTE: PROVIDE FOR DRIVEWAY ACCESS**

**KEY:**

-  8' TYPE III BARRICADE
-  CONSTRUCTION WARNING SIGNS
-  TYPE 'B' TRAILER MOUNT FLASHER
-  FLAG PERSON
-  REFLECTORIZED DRUM
-  REFLECTORIZED DRUM W/ WARNING SIGN
-  DIRECTION OF TRAVEL
-  CONSTRUCTION AREA


TRAFFIC CONTROL DETAILS  
 EXHIBIT 13G  
 Page 1 of 12  
 New Document: Dec. 2004

REVISION NO.	DATE	BY	DESCRIPTION

APPROVED: _____ CITY TRAFFIC ENGINEER	DATE: _____ CITY TRAFFIC ENGINEER
DESIGN C.J.R. _____ DRAWING B.D.R. / A.D. _____	HORZ. SCALE: NOTED VERT. SCALE: NOTED
CHECK: D.V.S. _____ REVISION NO. _____	DATE _____ BY _____

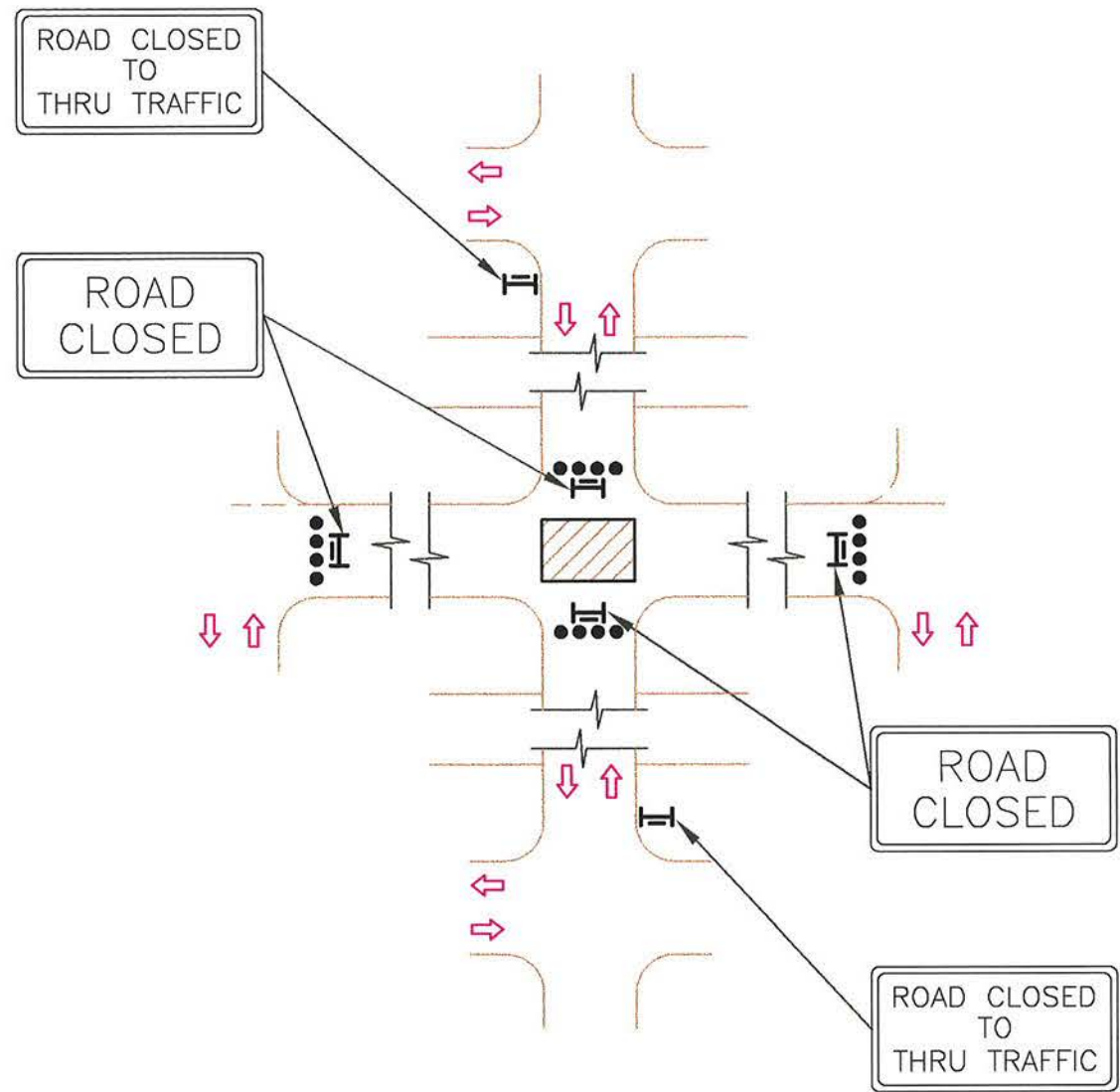
 <b>CITY OF CORPUS CHRISTI</b> <b>TEXAS</b> Department of Engineering Services Traffic Engineering Division
--

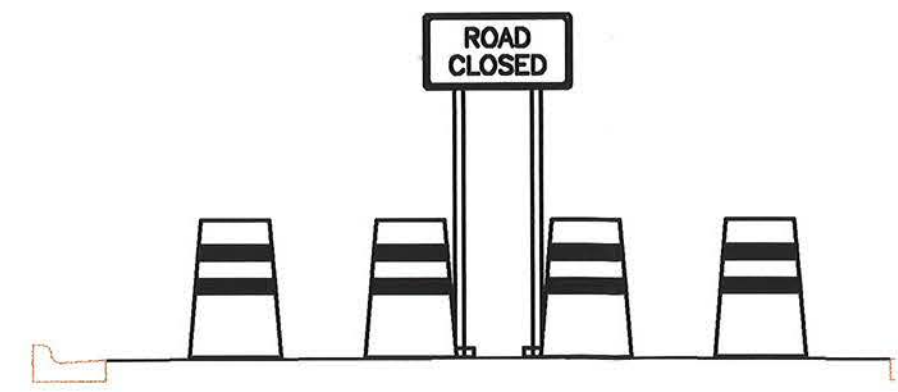
TYPICAL APPLICATION TRAFFIC CONTROL DETAIL
---

SHEET 1 of 12 RECORD DRAWING NO.	CITY PROJECT #
-------------------------------------	----------------











**TRAFFIC CONTROL DETAIL**  
**TYPICAL APPLICATION**  
**TEMPORARY STREET CLOSURE**  
**AT 4-WAY INTERSECTION**



**TRAFFIC CONTROL DETAIL**  
**TYPICAL TRAFFIC CONTROL**  
**SET-UP FOR RESIDENTIAL STREETS**

**NOTE: PROVIDE FOR DRIVEWAY ACCESS**

**KEY:**

-  8' TYPE III BARRICADE
-  CONSTRUCTION WARNING SIGNS
-  TYPE 'B' TRAILER MOUNT FLASHER
-  FLAG PERSON
-  REFLECTORIZED DRUM
-  REFLECTORIZED DRUM W/ WARNING SIGN
-  DIRECTION OF TRAVEL
-  CONSTRUCTION AREA


TRAFFIC CONTROL DETAILS  
 EXHIBIT 13G  
 Page 2 of 12  
 New Document: Dec. 2004

REVISION NO.	DATE	BY	DESCRIPTION

APPROVED:	CITY TRAFFIC ENGINEER	
DATE:		
DESIGN: C.A.F.	HORZ. SCALE: NOTED	
DRAWN: B.D.R. / A.D.	VERT. SCALE: NOTED	
CHECK: D.V.S.		
REVISION NO.	DATE	BY

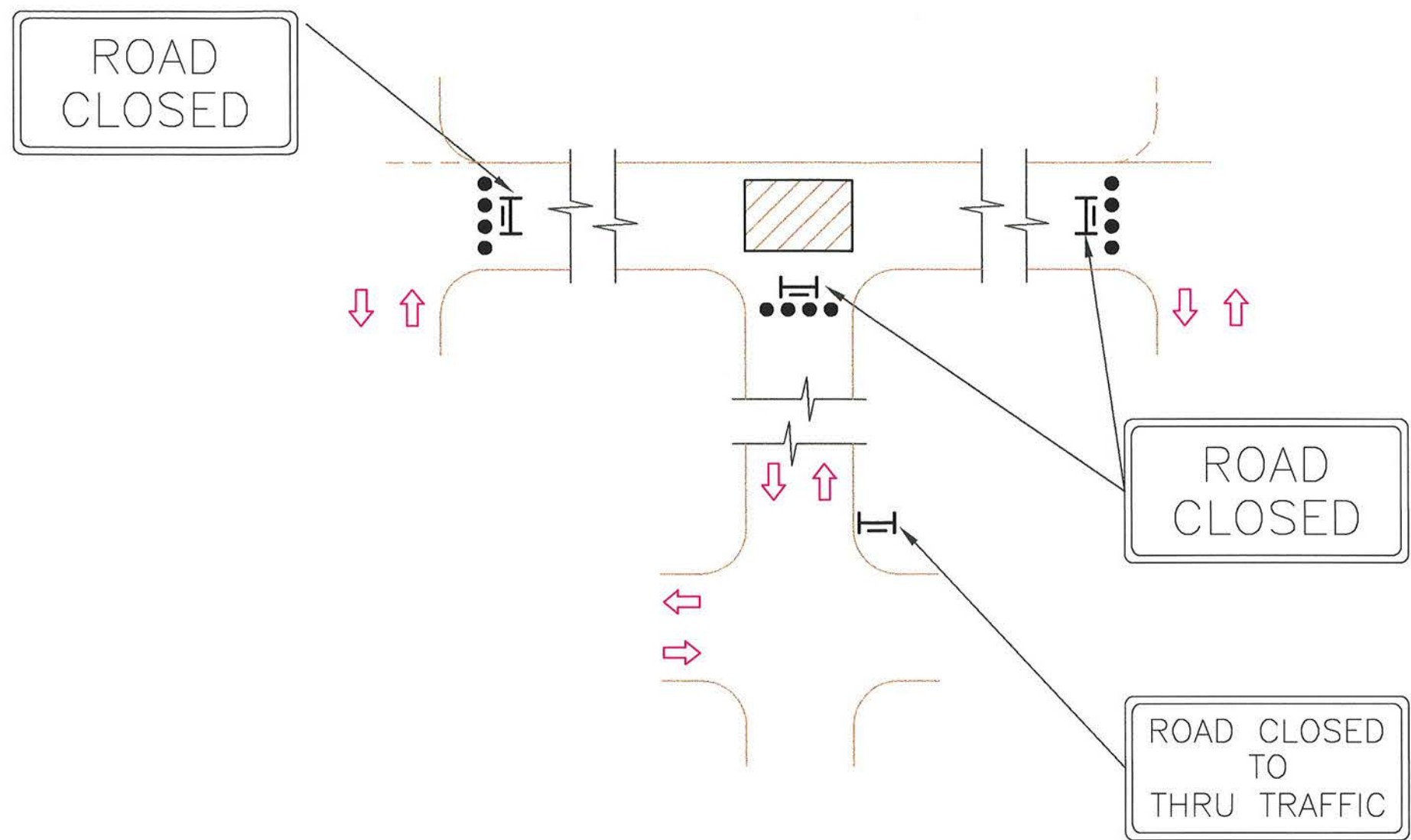
  

 <b>CITY OF CORPUS CHRISTI</b> <b>TEXAS</b> Department of Engineering Services Traffic Engineering Division	
TYPICAL APPLICATION TRAFFIC CONTROL DETAIL	

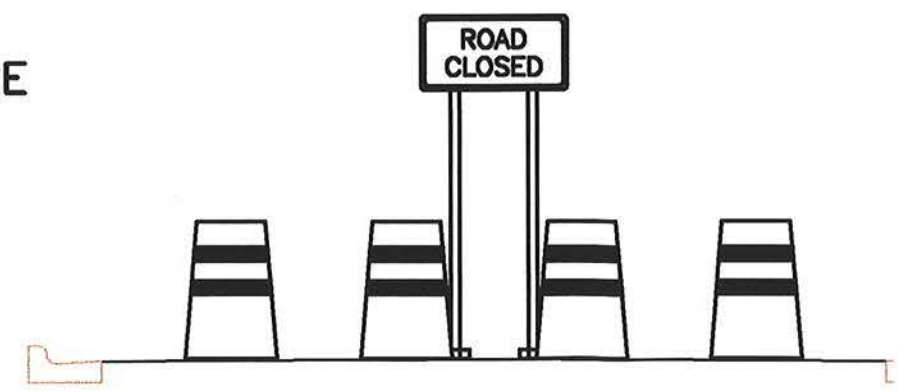
  

REVISION NO.	DATE	BY	DESCRIPTION

SHEET 2 of 12  
 RECORD DRAWING NO.  
 CITY PROJECT # 7226



**TRAFFIC CONTROL DETAIL**  
**TYPICAL APPLICATION**  
**TEMPORARY STREET CLOSURE**  
**AT 3-WAY INTERSECTION**



**TRAFFIC CONTROL DETAIL**  
**TYPICAL TRAFFIC CONTROL**  
**SET-UP FOR RESIDENTIAL STREETS**

**NOTE: PROVIDE FOR DRIVEWAY ACCESS**

**KEY:**

- I 8' TYPE III BARRICADE
- II CONSTRUCTION WARNING SIGNS
- III TYPE 'B' TRAILER MOUNT FLASHER
- IV FLAG PERSON
- REFLECTORIZED DRUM
- REFLECTORIZED DRUM W/ WARNING SIGN
- ↔ DIRECTION OF TRAVEL
- ▨ CONSTRUCTION AREA

TRAFFIC CONTROL DETAILS  
 EXHIBIT 13G  
 Page 3 of 12  
 New Document: Dec. 2004

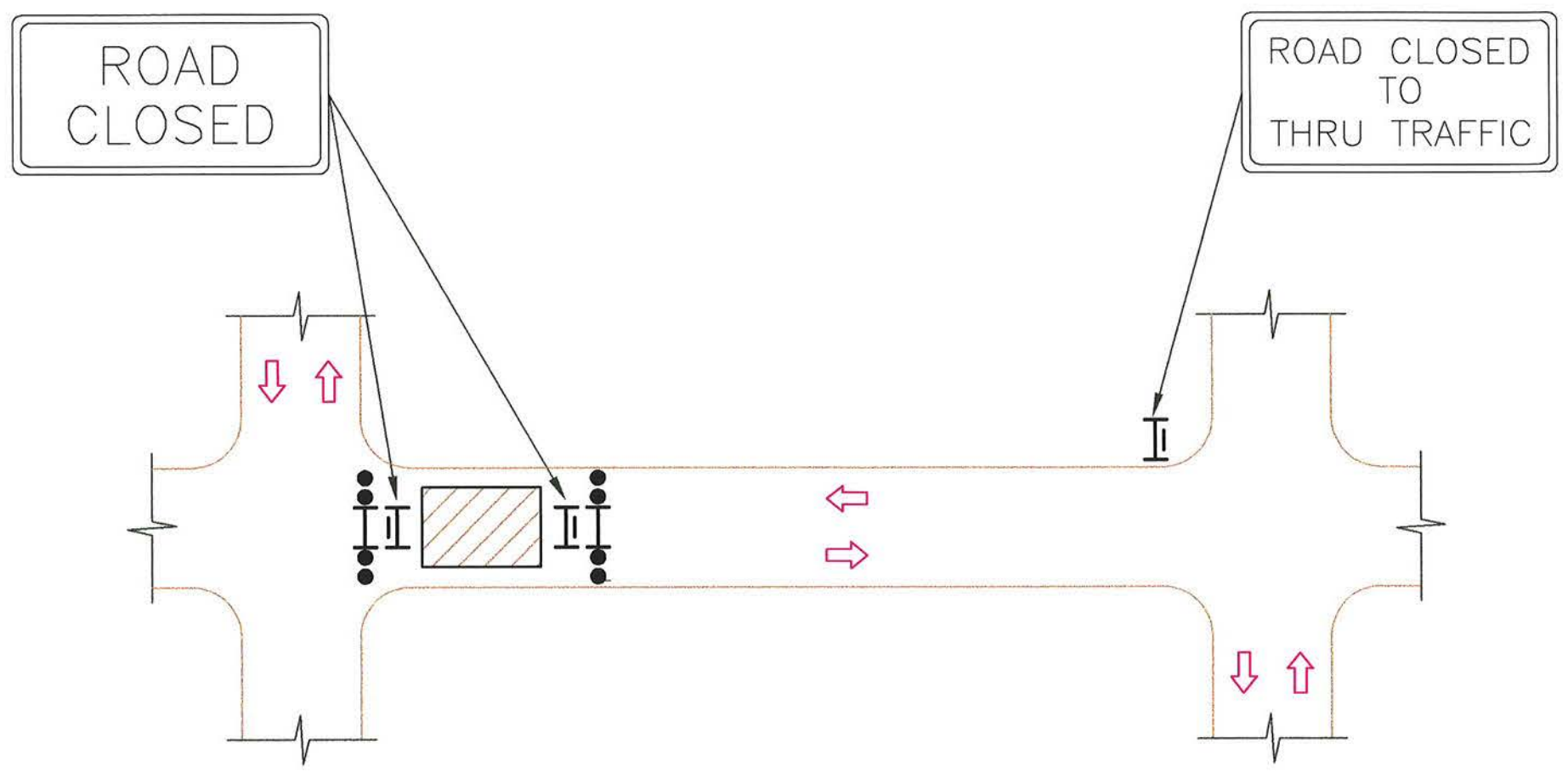
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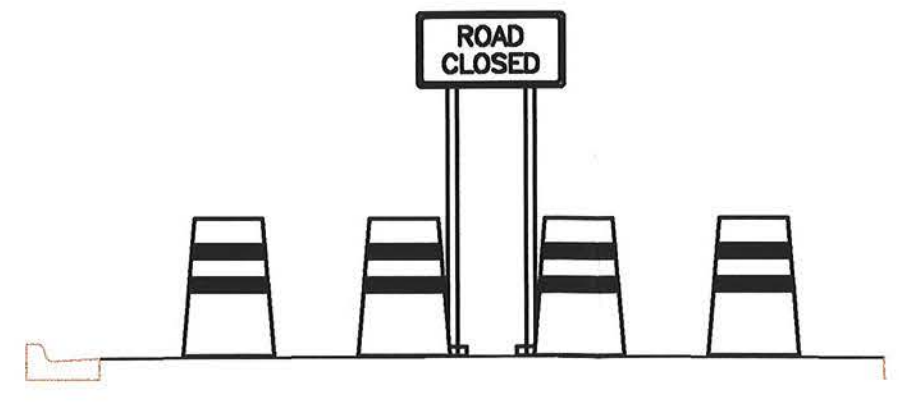
APPROVED:	CITY TRAFFIC ENGINEER
DATE:	
DESIGN: C.J.R.	HORIZ. SCALE: NOTED
DRAWN: B.D.R. / A.D.	VERT. SCALE: NOTED
CHECK: D.V.S.	
REVISION NO.	DATE

<p><b>CITY OF CORPUS CHRISTI</b>                  TEXAS                  Department of Engineering Services                  Traffic Engineering Division</p>
<p>TYPICAL APPLICATION                  TRAFFIC CONTROL DETAIL</p>
<p>SHEET 3 of 12                  RECORD DRAWING NO.                  CITY PROJECT # 7226</p>











**TRAFFIC CONTROL DETAIL**  
**TYPICAL APPLICATION**  
**MID-BLOCK ROAD CLOSURE**  
**NEAR INTERSECTION**




**TRAFFIC CONTROL DETAIL**  
**TYPICAL TRAFFIC CONTROL**  
**SET-UP FOR RESIDENTIAL STREETS**

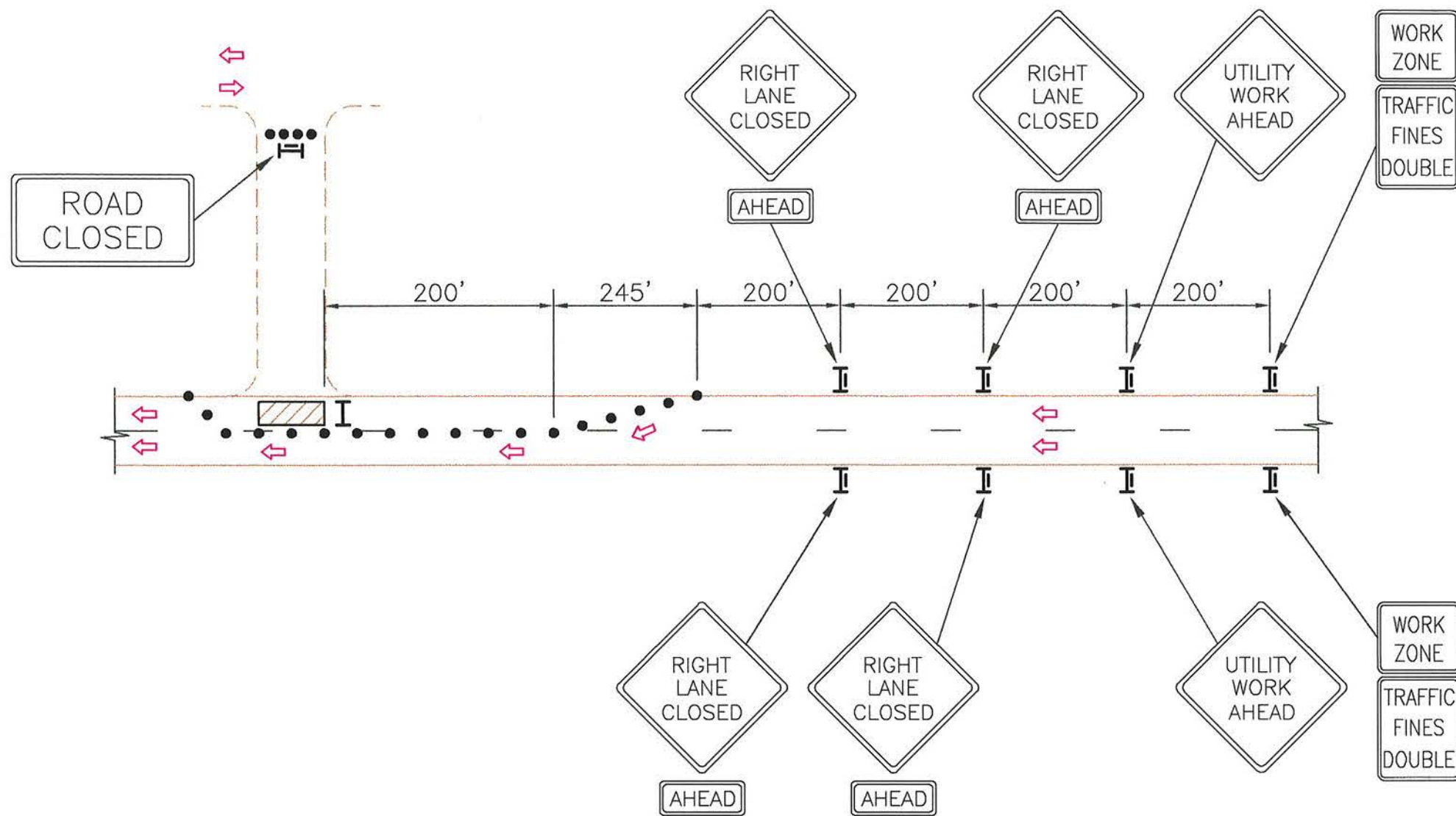
**NOTE: PROVIDE FOR DRIVEWAY ACCESS**  
**KEY:**

-  8' TYPE III BARRICADE
-  CONSTRUCTION WARNING SIGNS
-  TYPE 'B' TRAILER MOUNT FLASHER
-  FLAG PERSON
-  REFLECTORIZED DRUM
-  REFLECTORIZED DRUM W/ WARNING SIGN
-  DIRECTION OF TRAVEL
-  CONSTRUCTION AREA

TRAFFIC CONTROL DETAILS  
 EXHIBIT 13G  
 Page 4 of 12  
 New Document: Dec. 2004

	DESCRIPTION	DATE	BY	REVISION NO.	DATE	BY
	CITY TRAFFIC ENGINEER					
APPROVED:	DATE:	DESIGN: C.A.J.E.	HORIZ. SCALE: NOTED	CHECK: D.V.S.	VERT. SCALE: NOTED	REVISION NO.
		DRAWN: B.D.R. / A.D.				DATE
						BY
 CITY OF CORPUS CHRISTI TEXAS Department of Engineering Services Traffic Engineering Division						
TYPICAL APPLICATION TRAFFIC CONTROL DETAIL						
	DESCRIPTION	DATE	BY	REVISION NO.	DATE	BY
	SHEET 4 of 12					
	RECORD DRAWING NO.					
	CITY PROJECT # 7226					











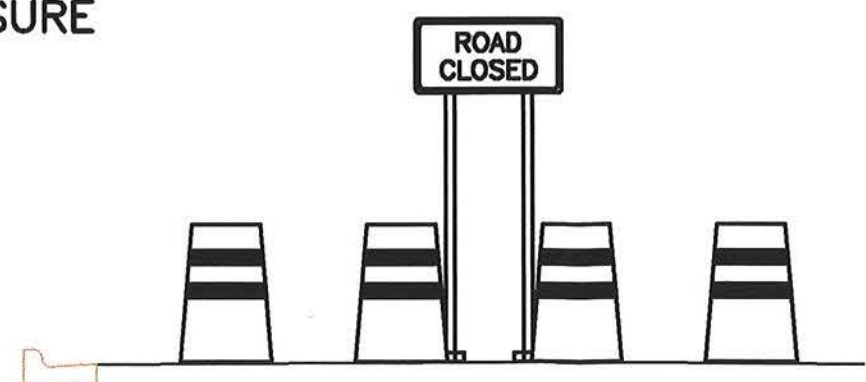


**TRAFFIC CONTROL DETAIL**  
**TYPICAL APPLICATION**  
**TEMPORARY ONE-LANE CLOSURE**  
**ONE-WAY ROADWAY**

**NOTE: PROVIDE FOR DRIVEWAY ACCESS**

**KEY:**

-  8' TYPE III BARRICADE
-  CONSTRUCTION WARNING SIGNS
-  TYPE 'B' TRAILER MOUNT FLASHER
-  FLAG PERSON
-  REFLECTORIZED DRUM
-  REFLECTORIZED DRUM W/ WARNING SIGN
-  DIRECTION OF TRAVEL
-  CONSTRUCTION AREA



**TRAFFIC CONTROL DETAIL**  
**TYPICAL TRAFFIC CONTROL**  
**SET-UP FOR RESIDENTIAL STREET**


TRAFFIC CONTROL DETAILS  
 EXHIBIT 13G  
 Page 6 of 12  
 New Document: Dec. 2004

REVISION NO.	DATE	BY	DESCRIPTION

APPROVED:	CITY TRAFFIC ENGINEER	
DATE:		
DESIGN: C.J.R.	HORIZ. SCALE: NOTED	
DRAWN: B.D.R. / A.D.	VERT. SCALE: NOTED	
CHECK: D.V.S.		
REVISION NO.	DATE	BY

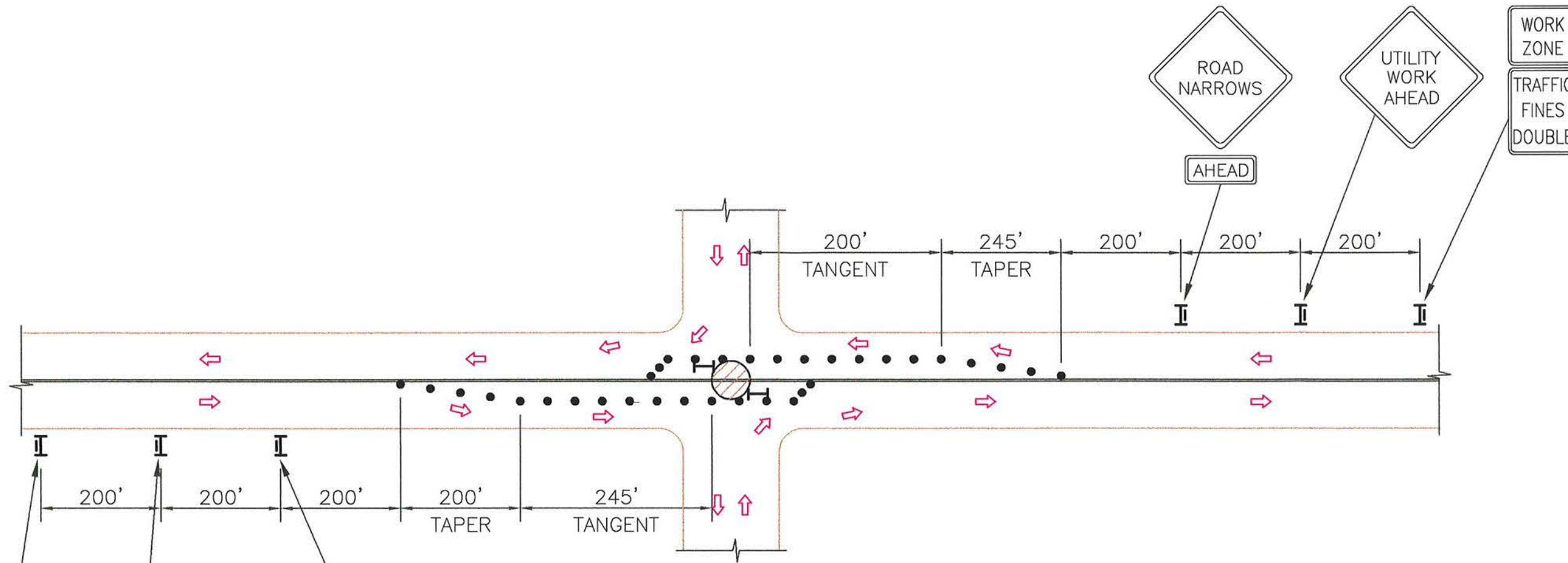
  

 <b>CITY of CORPUS CHRISTI</b> <b>TEXAS</b> Department of Engineering Services Traffic Engineering Division	
TYPICAL APPLICATION TRAFFIC CONTROL DETAIL	

REVISION NO.	DATE	BY	DESCRIPTION

SHEET 6 of 12  
 RECORD DRAWING NO.  
 CITY PROJECT # 7226



**TRAFFIC CONTROL DETAIL**  
**TYPICAL APPLICATION**  
**INTERSECTION LANE CLOSURES**

WORK ZONE  
 TRAFFIC FINES DOUBLE

UTILITY WORK AHEAD

ROAD NARROWS  
 AHEAD

**NOTE: PROVIDE FOR DRIVEWAY ACCESS**

**KEY:**

- ⊥ 8' TYPE III BARRICADE
- ⊥ CONSTRUCTION WARNING SIGNS
- ⊥ TYPE 'B' TRAILER MOUNT FLASHER
- ⊥ FLAG PERSON
- REFLECTORIZED DRUM
- REFLECTORIZED DRUM W/ WARNING SIGN
- ↔ DIRECTION OF TRAVEL
- ▨ CONSTRUCTION AREA



**TRAFFIC CONTROL DETAIL**  
**TYPICAL TRAFFIC CONTROL**  
**SET-UP FOR RESIDENTIAL STREETS**

TRAFFIC CONTROL DETAILS  
 EXHIBIT 13G  
 Page 7 of 12  
 New Document: Dec. 2004

REVISION NO.	DATE	DESCRIPTION

APPROVED:	CITY TRAFFIC ENGINEER
DATE:	
DESIGN: C.J.R.	HORIZ. SCALE: NOTED
DRAWN: B.D.R. / A.D.	VERT. SCALE: NOTED
CHECK: D.V.S.	
REVISION NO.	DATE

<p><b>CITY OF CORPUS CHRISTI</b>                  TEXAS                  Department of Engineering Services                  Traffic Engineering Division</p>
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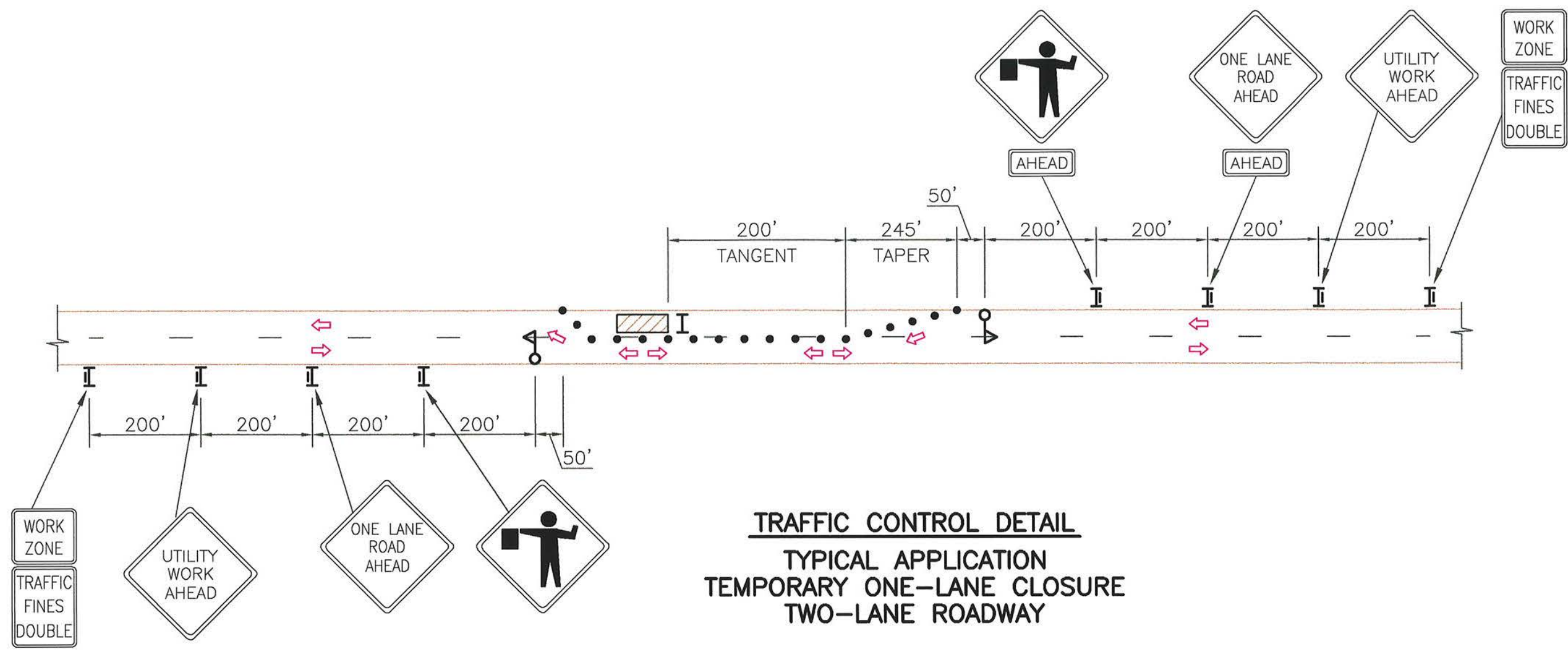
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REVISION NO.	DATE	DESCRIPTION









SHEET 7 of 12  
 RECORD DRAWING NO.  
 CITY PROJECT # 7226



**TRAFFIC CONTROL DETAIL**  
**TYPICAL APPLICATION**  
**TEMPORARY ONE-LANE CLOSURE**  
**TWO-LANE ROADWAY**

**NOTE: PROVIDE FOR DRIVEWAY ACCESS**

**KEY:**

-  8' TYPE III BARRICADE
-  CONSTRUCTION WARNING SIGNS
-  TYPE 'B' TRAILER MOUNT FLASHER
-  FLAG PERSON
-  REFLECTORIZED DRUM
-  REFLECTORIZED DRUM W/ WARNING SIGN
-  DIRECTION OF TRAVEL
-  CONSTRUCTION AREA

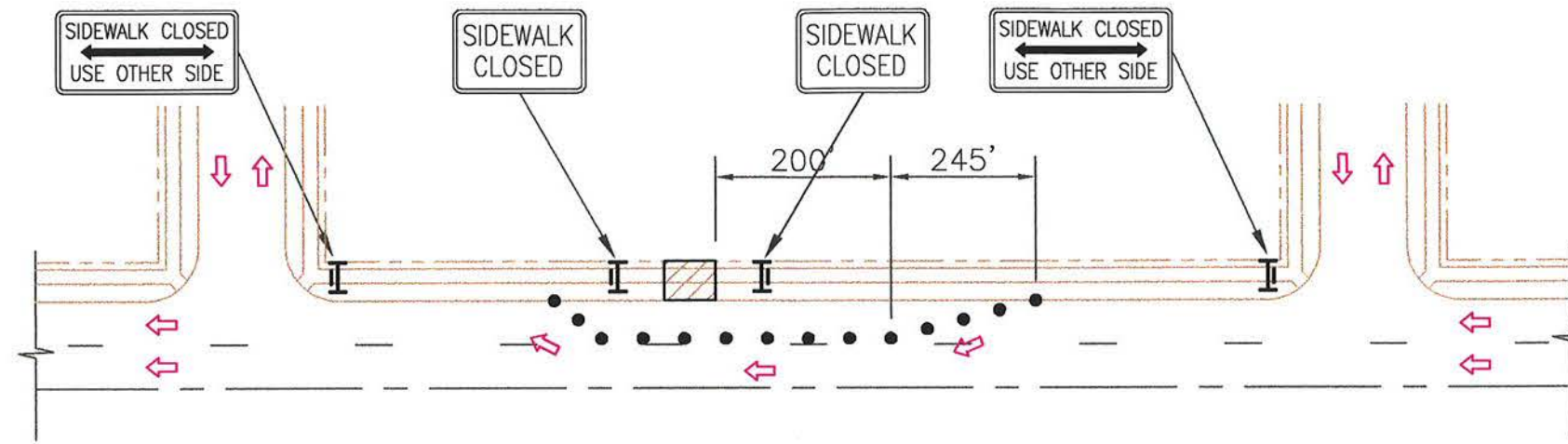


**TRAFFIC CONTROL DETAIL**  
**TYPICAL TRAFFIC CONTROL**  
**SET-UP FOR RESIDENTIAL STREETS**

TRAFFIC CONTROL DETAILS  
 EXHIBIT 13G  
 Page 8 of 12  
 New Document: Dec. 2004

DESCRIPTION		CITY TRAFFIC ENGINEER	
APPROVED:	DATE:	DESIGN: C.J.R.	HORIZ. SCALE: NOTED
REVISION NO.	DATE	DRAWN: B.D.R. / A.D.	VERT. SCALE: NOTED
BY	DATE	CHECK: D.V.S.	REVISION NO.
CITY of CORPUS CHRISTI TEXAS		Department of Engineering Services Traffic Engineering Division	
TYPICAL APPLICATION TRAFFIC CONTROL DETAIL			
REVISION NO.	DATE	BY	DESCRIPTION
SHEET 8 of 12		RECORD DRAWING NO.	
CITY PROJECT # 7226			











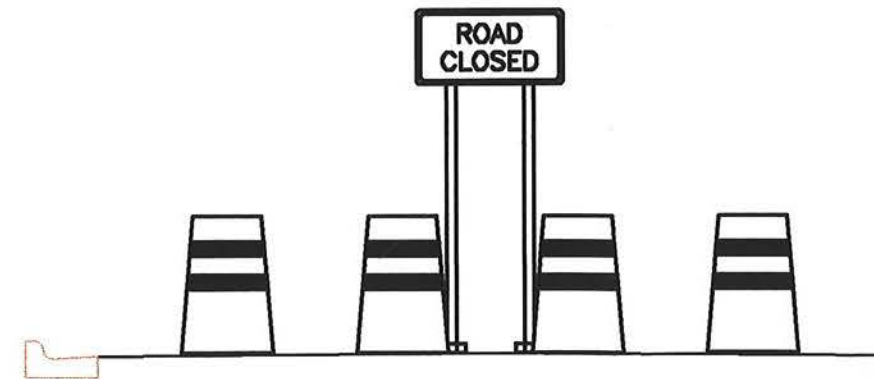


**TRAFFIC CONTROL DETAIL  
TYPICAL APPLICATION  
SIDEWALK CLOSURE**

**NOTE: PROVIDE FOR DRIVEWAY ACCESS**


**KEY:**

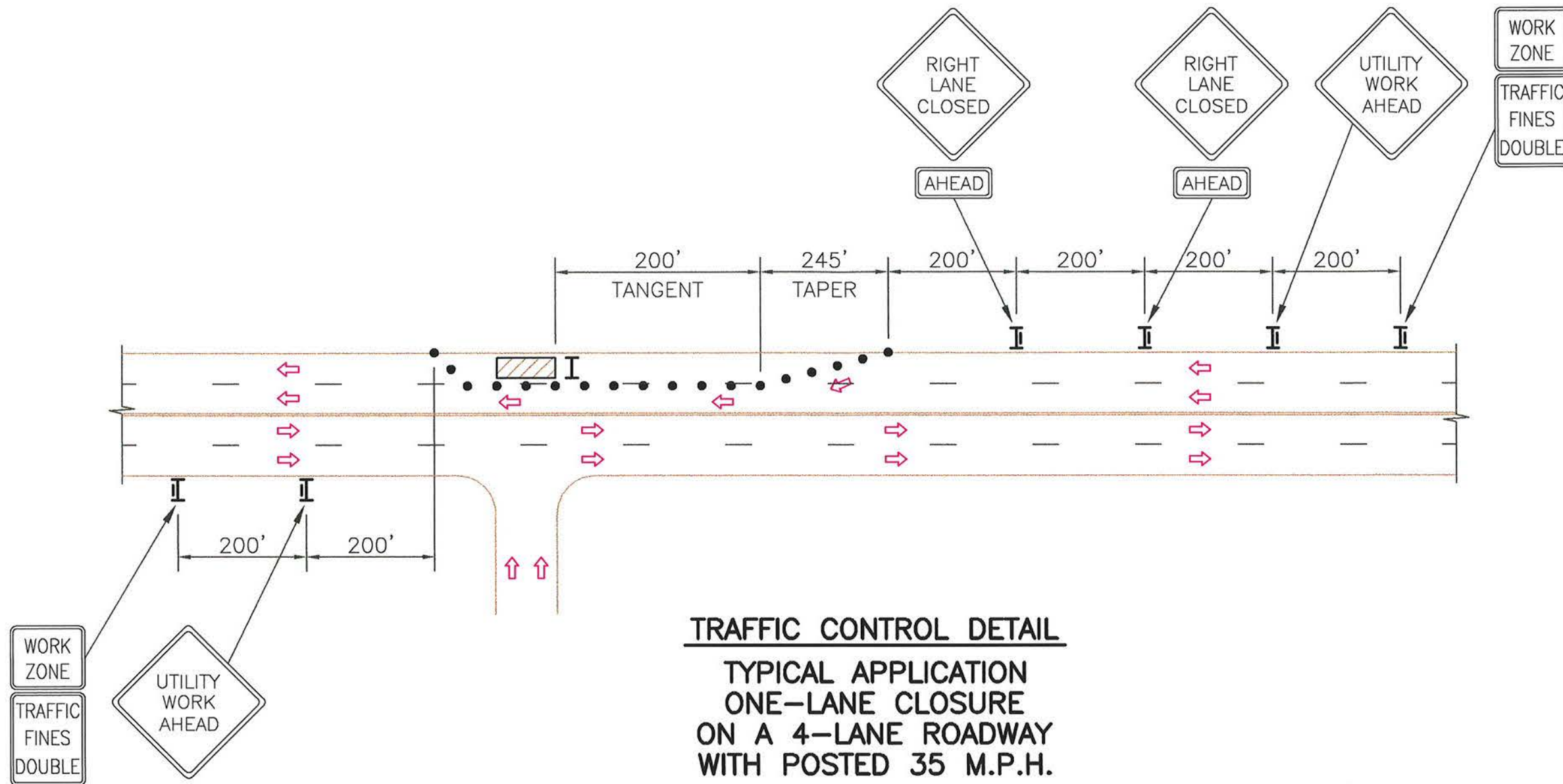
-  8' TYPE III BARRICADE
-  CONSTRUCTION WARNING SIGNS
-  TYPE 'B' TRAILER MOUNT FLASHER
-  FLAG PERSON
-  REFLECTORIZED DRUM
-  REFLECTORIZED DRUM W/ WARNING SIGN
-  DIRECTION OF TRAVEL
-  CONSTRUCTION AREA



**TRAFFIC CONTROL DETAIL  
TYPICAL TRAFFIC CONTROL  
SET-UP FOR RESIDENTIAL STREETS**

TRAFFIC CONTROL DETAILS  
EXHIBIT 13G  
Page 9 of 12  
New Document: Dec. 2004








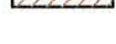
DESCRIPTION	REVISION NO.	DATE	BY
CITY TRAFFIC ENGINEER			
APPROVED:			
DATE:			
DESIGN: C.J.R.			
DRAWING B.D.R. / A.D.			
CHECKS: D.V.S.			
REVISION NO.			
DATE			
BY			
 <b>CITY of CORPUS CHRISTI TEXAS</b> Department of Engineering Services Traffic Engineering Division			
TYPICAL APPLICATION TRAFFIC CONTROL DETAIL			
DESCRIPTION	REVISION NO.	DATE	BY
TYPICAL APPLICATION TRAFFIC CONTROL DETAIL			
SHEET 9 of 12 RECORD DRAWING NO. CITY PROJECT # 7226			

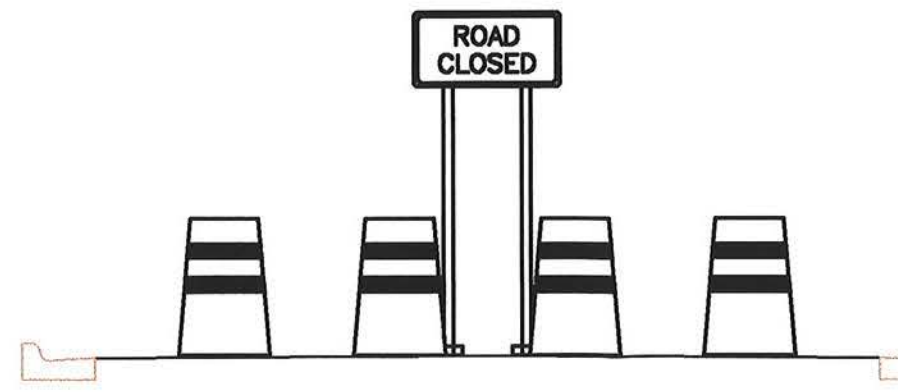


**TRAFFIC CONTROL DETAIL**  
**TYPICAL APPLICATION**  
**ONE-LANE CLOSURE**  
**ON A 4-LANE ROADWAY**  
**WITH POSTED 35 M.P.H.**

**NOTE: PROVIDE FOR DRIVEWAY ACCESS**


**KEY:**

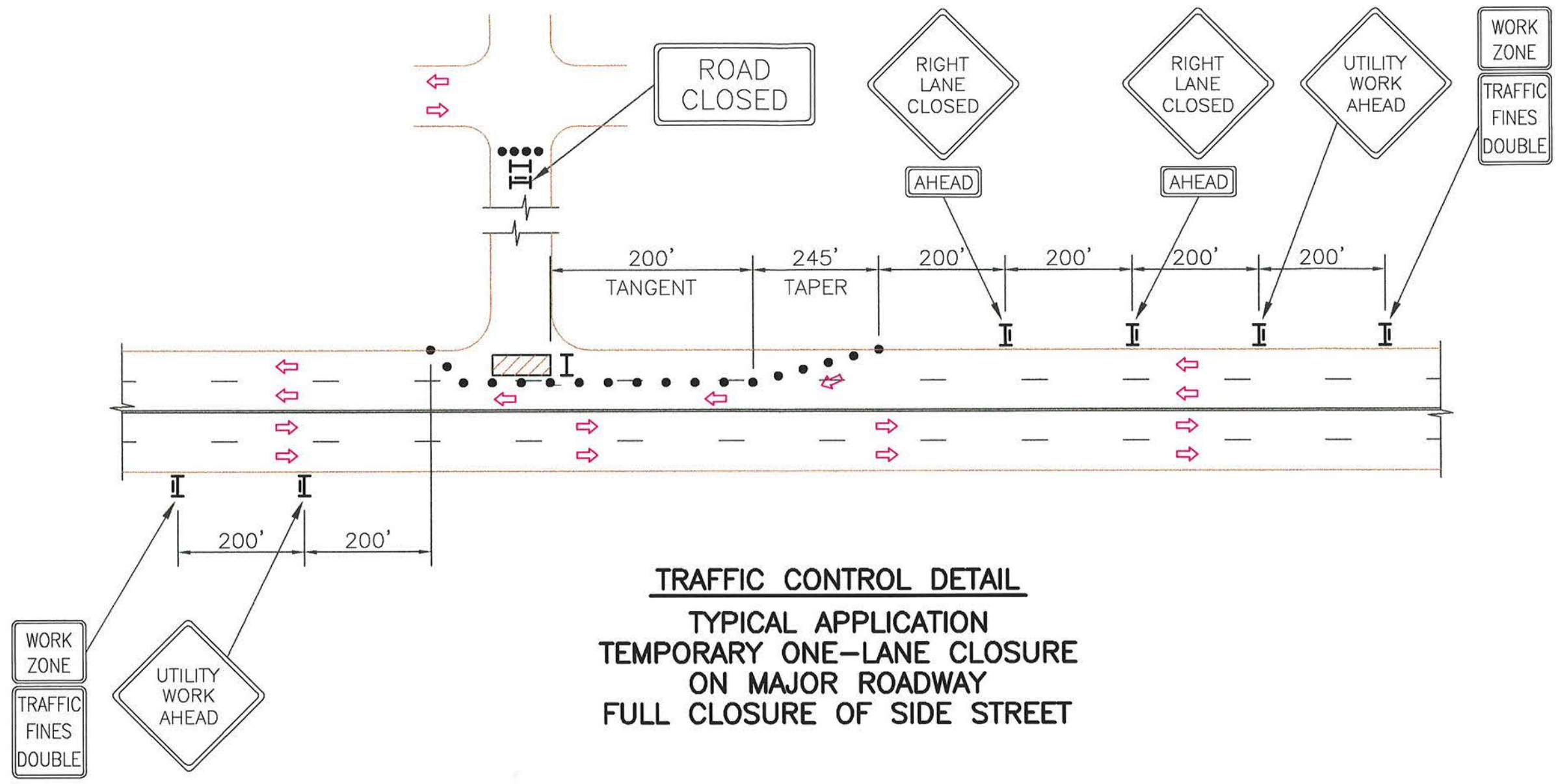
-  8' TYPE III BARRICADE
-  CONSTRUCTION WARNING SIGNS
-  TYPE 'B' TRAILER MOUNT FLASHER
-  FLAG PERSON
-  REFLECTORIZED DRUM
-  REFLECTORIZED DRUM W/ WARNING SIGN
-  DIRECTION OF TRAVEL
-  CONSTRUCTION AREA



**TRAFFIC CONTROL DETAIL**  
**TYPICAL TRAFFIC CONTROL**  
**SET-UP FOR RESIDENTIAL STREETS**

TRAFFIC CONTROL DETAILS  
 EXHIBIT 13G  
 Page 10 of 12  
 New Document: Dec. 2004









APPROVED: _____ CITY TRAFFIC ENGINEER				DATE: _____			
DESIGN: C.J.R.		HORZ. SCALE: NOTED		DRAWING: B.D.R. / A.D.		VERT. SCALE: NOTED	
CHECK: D.V.S.		REVISION NO.		DATE		BY	
 CITY of CORPUS CHRISTI TEXAS				Department of Engineering Services Traffic Engineering Division			
TYPICAL APPLICATION TRAFFIC CONTROL DETAIL							
				SHEET 10 of 12 RECORD DRAWING NO.			
				CITY PROJECT # 7226			



**TRAFFIC CONTROL DETAIL**  
**TYPICAL APPLICATION**  
**TEMPORARY ONE-LANE CLOSURE**  
**ON MAJOR ROADWAY**  
**FULL CLOSURE OF SIDE STREET**

**NOTE: PROVIDE FOR DRIVEWAY ACCESS**

**KEY:**

-  8' TYPE III BARRICADE
-  CONSTRUCTION WARNING SIGNS
-  TYPE 'B' TRAILER MOUNT FLASHER
-  FLAG PERSON
-  REFLECTORIZED DRUM
-  REFLECTORIZED DRUM W/ WARNING SIGN
-  DIRECTION OF TRAVEL
-  CONSTRUCTION AREA



**TRAFFIC CONTROL DETAIL**  
**TYPICAL TRAFFIC CONTROL**  
**SET-UP FOR RESIDENTIAL STREETS**


TRAFFIC CONTROL DETAILS  
 EXHIBIT 13G  
 Page 11 of 12  
 New Document: Dec. 2004

REVISION NO.	DATE	BY	DESCRIPTION

APPROVED:	CITY TRAFFIC ENGINEER
DATE:	
DESIGN: C.J.R.	HORZ. SCALE: NOTED
DRAWN: B.D.R. / A.L.D.	VERT. SCALE: NOTED
CHECK: D.V.S.	
REVISION NO.	DATE

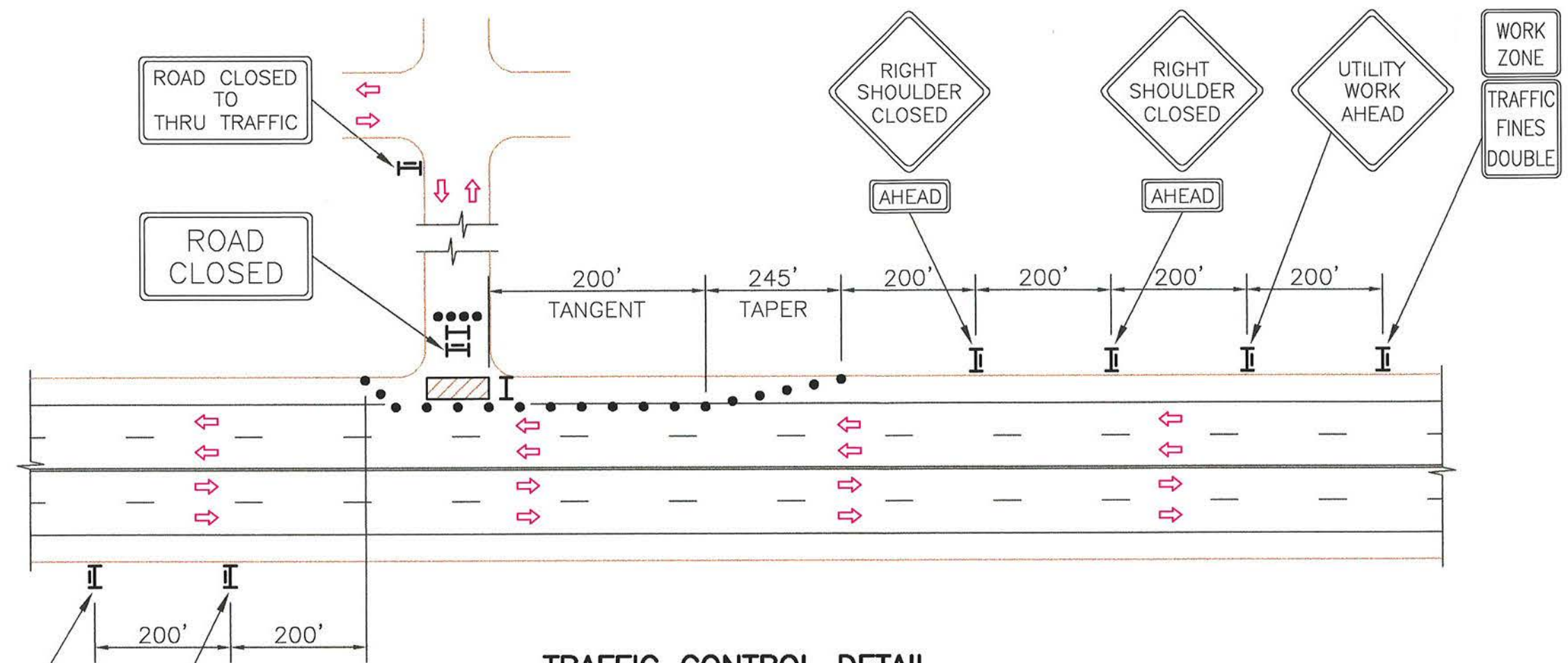
  

 <b>CITY OF CORPUS CHRISTI</b> <b>TEXAS</b> Department of Engineering Services Traffic Engineering Division	
TYPICAL APPLICATION TRAFFIC CONTROL DETAIL	

REVISION NO.	DATE	BY	DESCRIPTION

SHEET 11 of 12  
 RECORD DRAWING NO.  
 CITY PROJECT # 7226











**TRAFFIC CONTROL DETAIL**  
**TYPICAL APPLICATION**  
**SIDE STREET CLOSURE**  
**AT MAJOR INTERSECTION**  
**WITH SHOULDER LANE**




**TRAFFIC CONTROL DETAIL**  
**TYPICAL TRAFFIC CONTROL**  
**SET-UP FOR RESIDENTIAL STREETS**

**NOTE: PROVIDE FOR DRIVEWAY ACCESS**

**KEY:**

-  8' TYPE III BARRICADE
-  CONSTRUCTION WARNING SIGNS
-  TYPE 'B' TRAILER MOUNT FLASHER
-  FLAG PERSON
-  REFLECTORIZED DRUM
-  REFLECTORIZED DRUM W/ WARNING SIGN
-  DIRECTION OF TRAVEL
-  CONSTRUCTION AREA

TRAFFIC CONTROL DETAILS  
 EXHIBIT 13G  
 Page 12 of 12  
 New Document: Dec. 2004

	REVISION NO.	DATE	BY	DESCRIPTION
				APPROVED: _____ CITY TRAFFIC ENGINEER
				DATE: _____
				DESIGNER: C.J.R. _____ HORIZ. SCALE: NOTED
				DRAWING B.D.R. / A.D. _____ VERT. SCALE: NOTED
				CHECKER: D.V.S. _____ REVISION NO. _____ DATE _____ BY _____
 <b>CITY of CORPUS CHRISTI</b> <b>TEXAS</b> Department of Engineering Services Traffic Engineering Division				
<b>TYPICAL APPLICATION</b> <b>TRAFFIC CONTROL DETAIL</b>				
				SHEET 12 of 12 RECORD DRAWING NO.
				CITY PROJECT # 7226

# **Exhibit 13**

## **h. NEW Construction Plan**

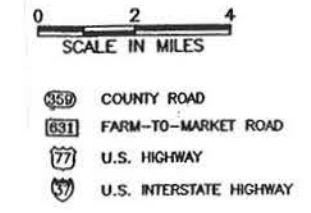
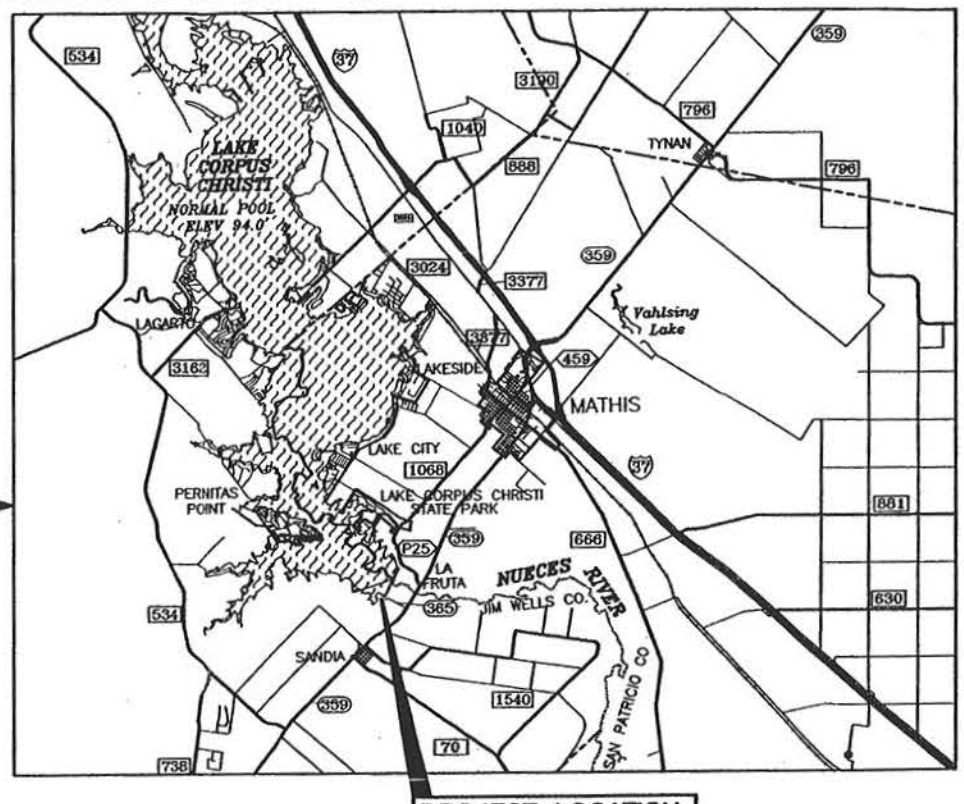
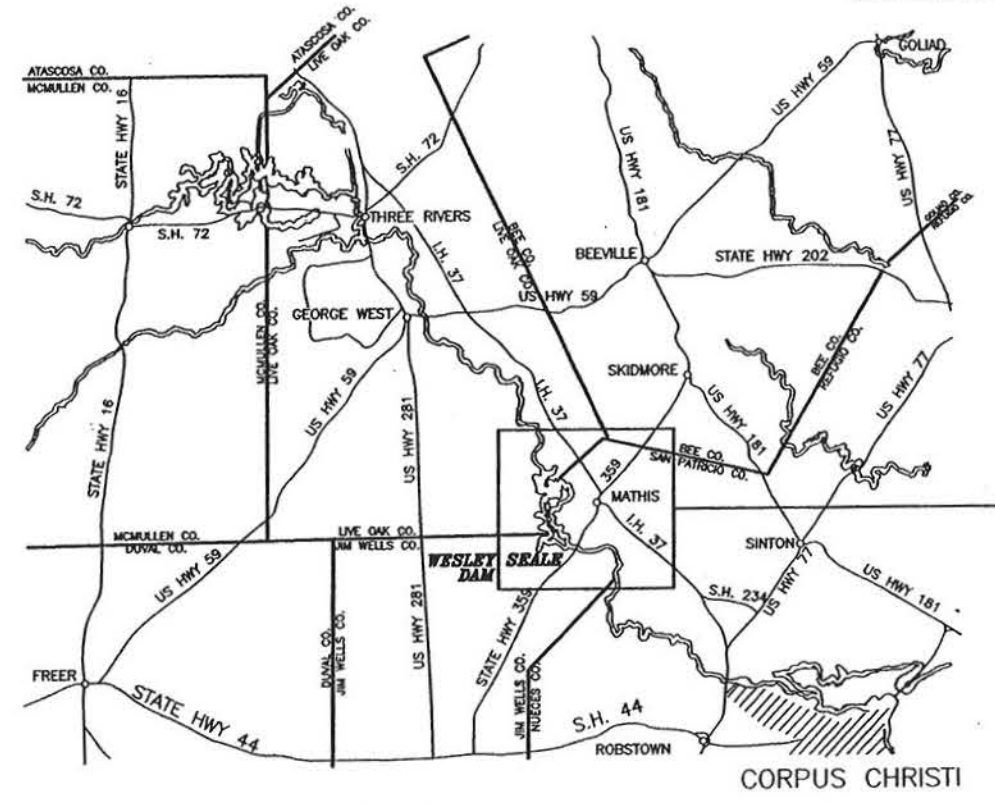
### **Sample**

**(Revised December 2004)**

**CALL BEFORE YOU DIG!**  
 TEXAS ONE CALL PARTICIPANTS REQUEST  
 48 HOURS NOTICE BEFORE YOU DIG,  
 DRILL, OR BLAST - STOP AND CALL  
 **Texas One Call System**  
 1-800-245-4545  
 SOUTHWESTERN BELL LOCATE GROUP  
 AT 1-800-828-5127  
 THE LONE STAR  
 NOTIFICATION COMPANY  
 AT 1-800-669-8344  
 TEXAS EXCAVATION SAFETY SYSTEM  
 1-800-344-8377

**SHEET INDEX**

SHEET NO.	DESCRIPTION
1.	TITLE SHEET
2.	NOTES, LEGEND, AND ABBREVIATIONS
3.	SITE PLAN
4.	ELECTRICAL RISER DIAGRAM



PLANS FOR  
 (WATER)  
**WESLEY SEALE DAM OPERATIONS CENTER  
 EMERGENCY GENERATOR**

(YR 2002)  
 PROJECT # 8413  
 DRAWING # WTR-335

**FREESE & NICHOLS**  
 CONSULTING ENGINEERS  
 6200 LA CALMA, STE. 210  
 AUSTIN, TEXAS 78752  
 FNI PROJECT # COR01457

**ISSUED FOR BID**

APPROVED: *Eduardo Garza* 4/8/02  
 Date  
 APPROVED: *Micio B. Garza* 8 APR 2002  
 Date  
 APPROVED: *Angel R. Escobar* 4/4/02  
 Date

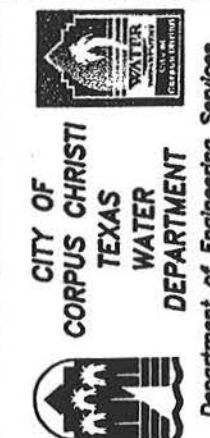
CONSTRUCTION PLAN SAMPLE  
 EXHIBIT 13  
 Page 1 of 4  
 New Document: Dec. 2004

CITY OF CORPUS CHRISTI TEXAS WATER DEPARTMENT Department of Engineering Services	
WESLEY SEALE DAM OPERATIONS CENTER EMERGENCY GENERATOR	TITLE SHEET
SHEET 1 of 4 RECORD DRAWING NO. WTR-335 CITY PROJECT # 8413	
REVISION NO.	DATE
1	3/26/02
ISSUED FOR BID	ISSUED FOR BID

ACAD Ref. 15.06  
 (CORP) 15.07  
 (CORP) 15.08  
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 (CORP) 16.00



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 Austin, Texas 78752  
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Department of Engineering Services

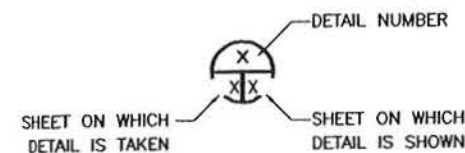
**WESLEY SEALE DAM  
 OPERATIONS CENTER  
 EMERGENCY GENERATOR**

**NOTES, LEGEND,  
 AND ABBREVIATIONS**

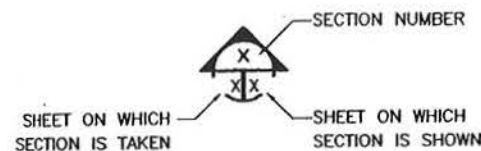
**GENERAL NOTES**

1. ELECTRICAL WORK SHALL BE EXECUTED IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE AND ALL STATE AND LOCAL CODES. IF THE STANDARDS AND CODES CONFLICT WITH EACH OTHER, THE MOST STRINGENT SHALL APPLY.
2. FACILITIES SHALL REMAIN IN USE THROUGHOUT CONSTRUCTION. COORDINATE CONSTRUCTION ACTIVITIES AND LAYDOWN OF MATERIALS AND EQUIPMENT TO MINIMIZE DISRUPTION OF NORMAL FACILITY OPERATIONS.
3. UTILITY OUTAGES SHALL OCCUR AT NIGHT OR ON WEEKENDS. COORDINATE ALL UTILITY OUTAGES WITH OWNER'S REPRESENTATIVE.
4. CONTRACTOR SHALL COORDINATE ALL SITE WORK WITH EXISTING UTILITIES. VERIFY LOCATION OF ALL UTILITIES BEFORE DIGGING.

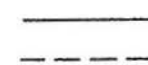
**LEGEND**



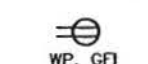
DETAIL MARKER



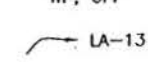
SECTION MARKER



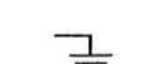
WIRING IN CONDUIT EXPOSED



UNDERGROUND WIRING IN CONDUIT CONCEALED



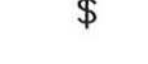
DUPLEX RECEPTACLE, GROUNDED TYPE  
 WEATHERPROOF, GROUNDED FAULT INTERRUPTER



HOMERUN, PANEL BOARD CIRCUIT AS INDICATED



GROUND

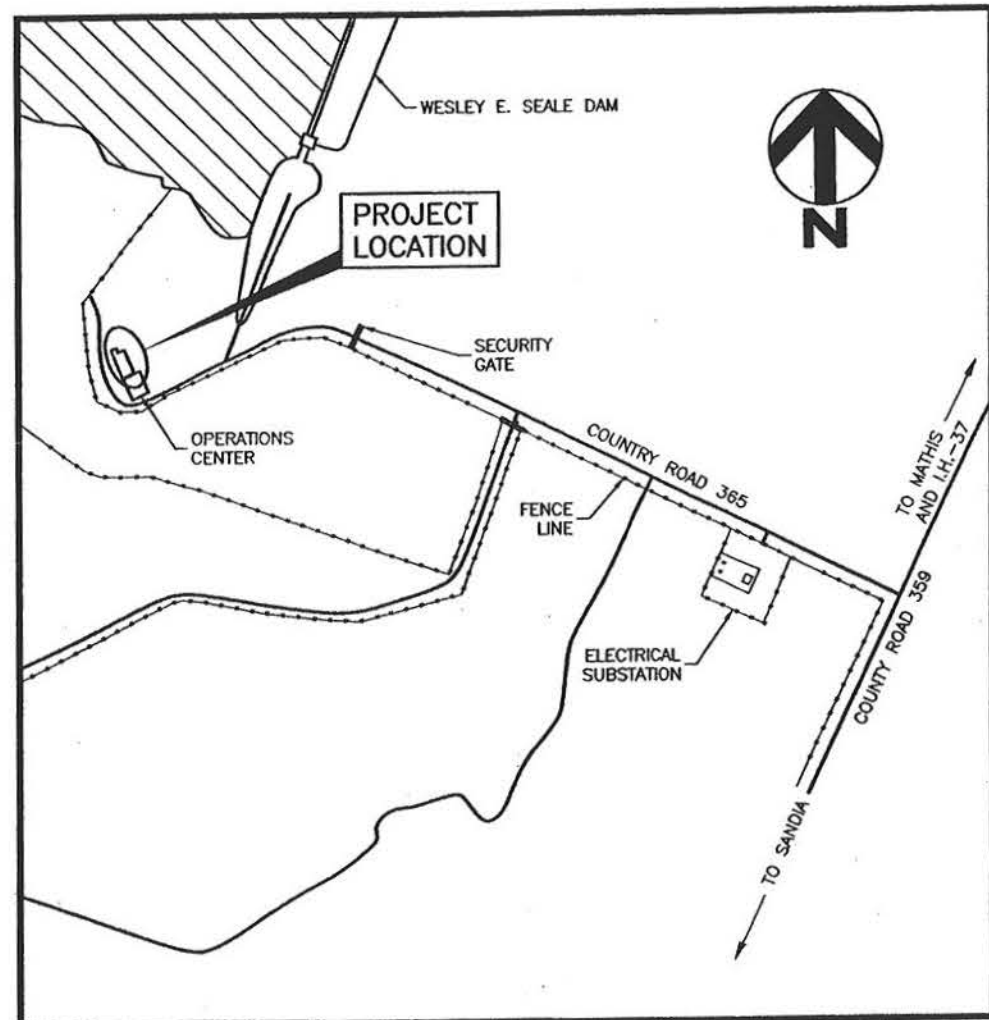


SINGLE POLE SWITCH

**ABBREVIATIONS**

A	AMPERES	KW	KILOWATT
AFF	ABOVE FINISHED FLOOR	LED	LIGHT EMITTING DIODE
ATS	AUTOMATIC TRANSFER SWITCH	MAX.	MAXIMUM
AWG	AMERICAN WIRE GAUGE	MCB	MAIN CIRCUIT BREAKER
C	CONDUIT	MFR	MANUFACTURER
CB	CIRCUIT BREAKER	MIN.	MINIMUM
C/C	CENTER TO CENTER	NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
CONT.	CONTINUED	NTS	NOT TO SCALE
DIA.	DIAMETER	P	POLE
EXIST.	EXISTING	PH OR Ø	PHASE
EW	EACH WAY	PR	PAIR
FT.	FEET	PVC	POLYVINYL CHLORIDE
G.	GROUND	SHLD.	SHIELDED
G.A.	GAUGE	SS	STAINLESS STEEL
GF	GROUND FAULT INTERRUPTER	TYP.	TYPICAL
HTR	HEATER	V	VOLT
HZ	HERTZ	W	WITH OR WATT
JBOX	JUNCTION BOX	WP	WEATHER PROOF
KVA	KILOVOLT-AMPERE		

KW	KILOWATT
LED	LIGHT EMITTING DIODE
MAX.	MAXIMUM
MCB	MAIN CIRCUIT BREAKER
MFR	MANUFACTURER
MIN.	MINIMUM
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NTS	NOT TO SCALE
P	POLE
PH OR Ø	PHASE
PR	PAIR
PVC	POLYVINYL CHLORIDE
SHLD.	SHIELDED
SS	STAINLESS STEEL
TYP.	TYPICAL
V	VOLT
W	WITH OR WATT
WP	WEATHER PROOF



**LOCATION MAP**  
 1"=1000'

ACAD File: 15.066  
 User: RRC  
 COR01457\IN\CAD  
 MAR 25, 2002 4:11 P.M. LRS: 1.00  
 PSLTS: 1 TWIST: 90.0  
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CONSTRUCTION PLAN SAMPLE  
 EXHIBIT 13  
 Page 2 of 4  
 New Document: Dec. 2004

1	3/26/02	JSW	ISSUED FOR BID	DESCRIPTION
				BY
				DATE
				REVISION NO.
				SHEET 2 of 4
				RECORD DRAWING NO.
				WTR-335
				CITY PROJECT # 8413



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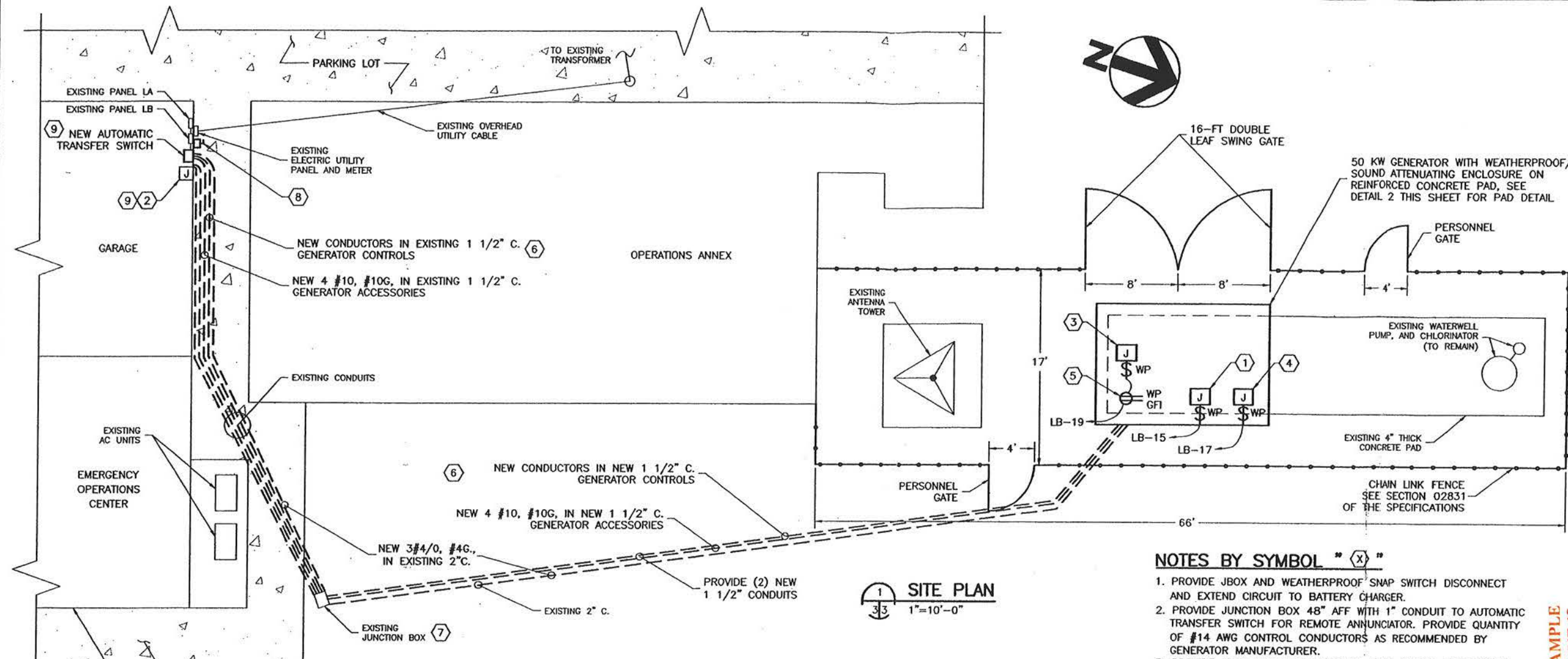
**CITY OF CORPUS CHRISTI TEXAS WATER DEPARTMENT**  
 Department of Engineering Services

**WESLEY SEALE DAM OPERATIONS CENTER EMERGENCY GENERATOR**

**SITE PLAN**

SHEET 3 of 4  
 RECORD DRAWING NO. **WTR-335**  
 CITY PROJECT # 8413

**CONSTRUCTION PLAN SAMPLE**  
**EXHIBIT 13**  
 Page 3 of 4  
 New Document: Dec. 2004



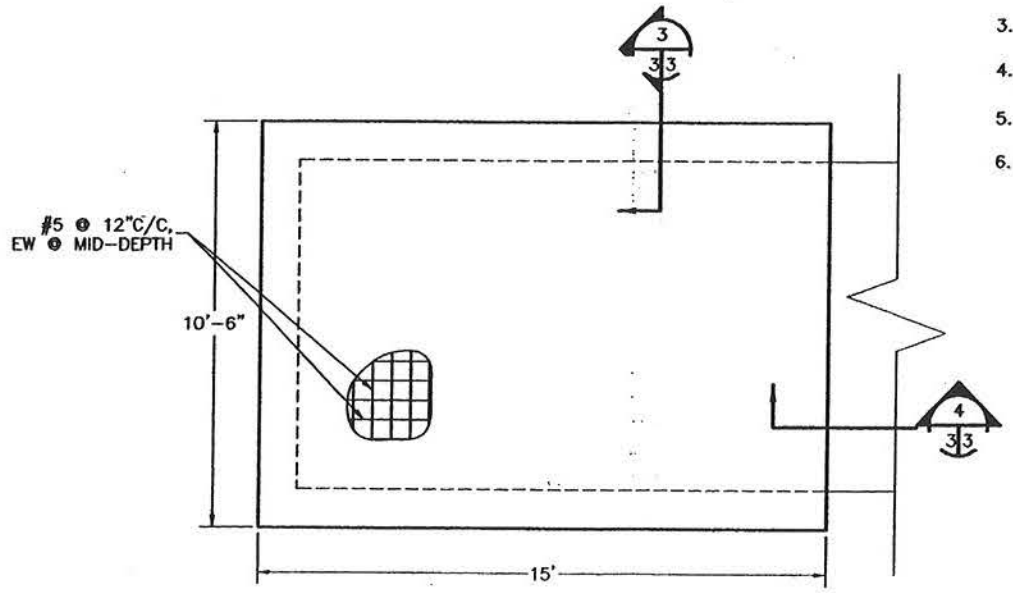
**1 SITE PLAN**  
 1"=10'-0"

**NOTES BY SYMBOL "X"**

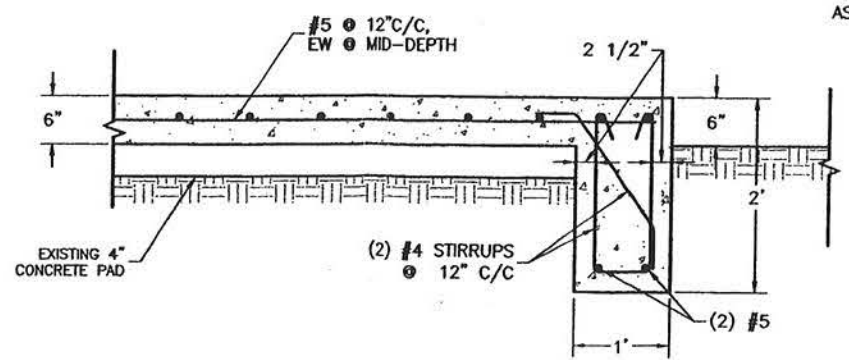
1. PROVIDE JBOX AND WEATHERPROOF SNAP SWITCH DISCONNECT AND EXTEND CIRCUIT TO BATTERY CHARGER.
2. PROVIDE JUNCTION BOX 48" AFF WITH 1" CONDUIT TO AUTOMATIC TRANSFER SWITCH FOR REMOTE ANNUNCIATOR. PROVIDE QUANTITY OF #14 AWG CONTROL CONDUCTORS AS RECOMMENDED BY GENERATOR MANUFACTURER.
3. PROVIDE JBOX AND WEATHERPROOF SNAP SWITCH DISCONNECT FOR GENERATOR CONTROLS.
4. PROVIDE JBOX AND WEATHERPROOF SNAP SWITCH DISCONNECT AND EXTEND CIRCUIT TO COOLANT JACKET HEATER.
5. PROVIDE WP, GFI RECEPTACLE INSIDE GENERATOR.
6. PROVIDE NEW ATS AND GENERATOR REMOTE ANNUNCIATOR CONTROL WIRING IN EXISTING 1 1/2" CONDUIT. PROVIDE QUANTITY OF #14 AWG CONTROL CONDUCTORS AS RECOMMENDED BY GENERATOR MANUFACTURER.
7. PROVIDE BARRIERS IN EXISTING JUNCTION BOX BETWEEN LOW VOLTAGE CONTROL CONDUCTORS AND LINE VOLTAGE POWER CONDUCTORS.
8. PROVIDE NEW SERVICE ENTRANCE RATED 400 AMP, 2 POLE, NEMA 3R FUSED DISCONNECT SWITCH ON EXTERIOR WALL ADJACENT TO EXISTING METER. FIELD VERIFY AVAILABLE WORKSPACE CLEARANCE AS REQUIRED BY THE NEC.
9. MOUNT ON EXISTING PLYWOOD BACKBOARD ADJACENT TO EXISTING PANELS. PROVIDE ADDITIONAL PLYWOOD BACKBOARD AS NECESSARY.

**STRUCTURAL NOTES**

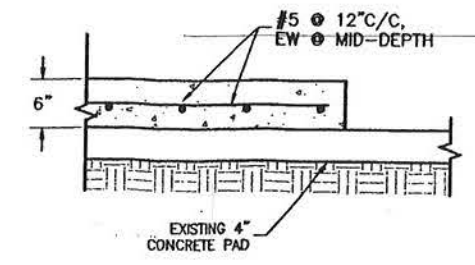
1. EXCAVATE SURFACE AS REQUIRED. FOLLOWING EXCAVATION, COMPACT SUBGRADE TO 95% OF STANDARD PROCTOR AND ADD 2" SAND CUSHION BEFORE PLACING CONCRETE.
2. CONCRETE SHALL BE IN ACCORDANCE WITH ACI 318-99 AND SHALL HAVE A COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.
3. REINFORCEMENT SHALL BE IN ACCORDANCE WITH ASTM A615, GRADE 60, Fy = 60,000 PSI.
4. MAINTAIN 3" CLEAR COVER AT SOIL INTERFACE AND 2" CLEAR COVER ELSEWHERE UNLESS OTHERWISE INDICATED.
5. EXPOSED CONCRETE SHALL HAVE A BROOM FINISH AND 3/8" CHAMFERS ON EDGES.
6. BROOM SWEEP AND HOSE OFF SURFACE OF EXISTING CONCRETE PAD BEFORE PLACEMENT OF CONCRETE.



**2 GENERATOR PAD-PLAN VIEW**  
 1"=5'-0"



**3 SECTION (TYP. 3 SIDES)**  
 1/2"=1'-0"



**4 SECTION**  
 1/2"=1'-0"

User: RRC  
 Job: WESLEY SEALE DAM OPERATIONS CENTER  
 Date: 3/26/02  
 Scale: 1/2"=1'-0"  
 Plot: 3/26/02 3:11 PM  
 Path: C:\Users\RRC\Documents\Projects\Wesley Seale Dam\Wesley Seale Dam.dwg  
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 Plot Style: WTR.ctb  
 Reference File: WTR.ctb  
 ACAD Plot 15.06a  
 User: RRC  
 Job: WESLEY SEALE DAM OPERATIONS CENTER  
 Date: 3/26/02  
 Scale: 1/2"=1'-0"  
 Plot: 3/26/02 3:11 PM  
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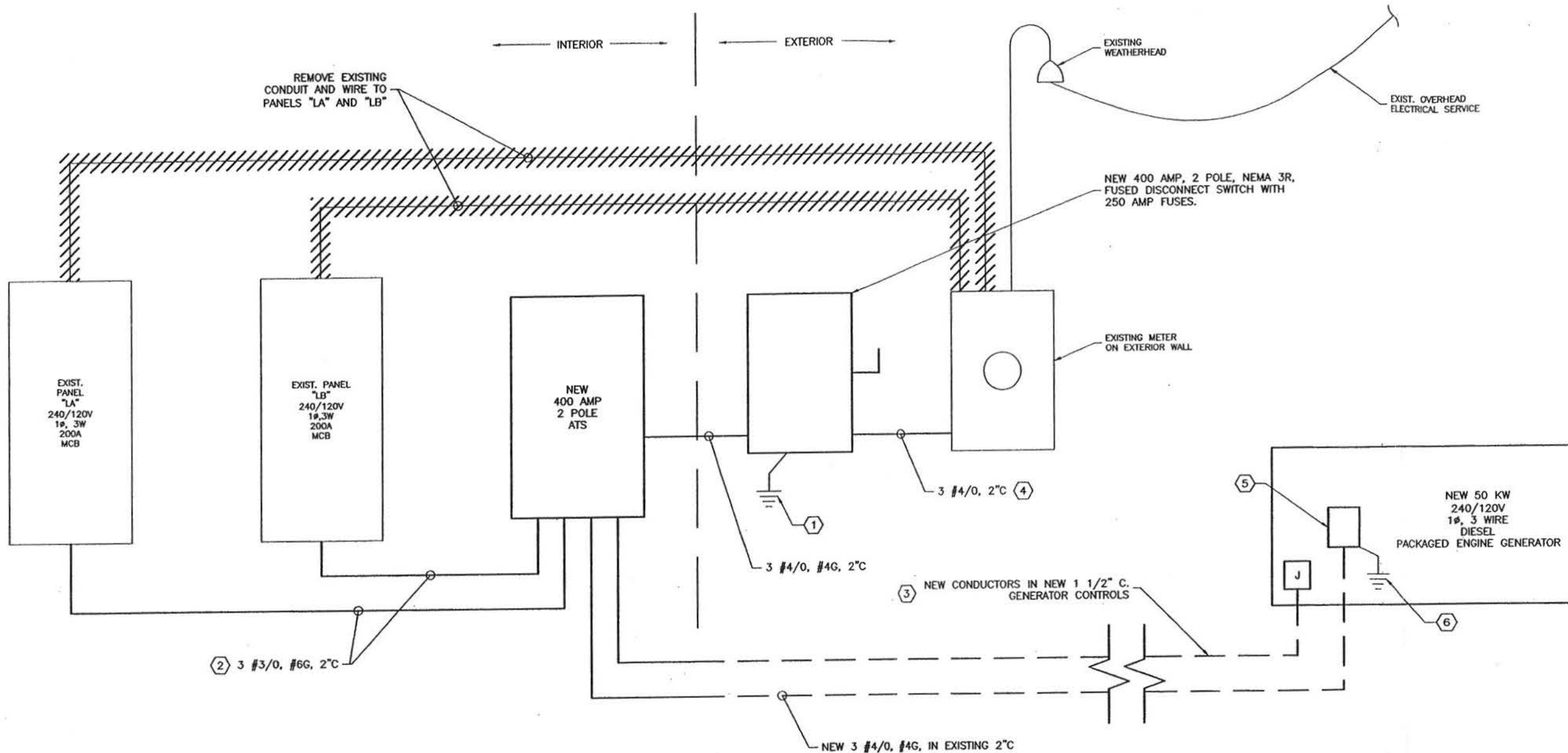
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 Austin, Texas 78752  
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**CITY OF CORPUS CHRISTI TEXAS WATER DEPARTMENT**  
 Department of Engineering Services

**WESLEY SEALE DAM OPERATIONS CENTER EMERGENCY GENERATOR ELECTRICAL RISER DIAGRAM**

SHEET 4 of 4  
 RECORD DRAWING NO. WTR-335  
 CITY PROJECT # 8413



**ELECTRICAL RISER DIAGRAM**  
 N.T.S.

**NOTES BY SYMBOL "X"**

1. PROVIDE NEW #2 GROUND IN 1/2" CONDUIT TO BUILDING STEEL, TO NEW 5/8" X 10' COPPER CLAD STEEL DRIVEN GROUND ROD, AND TO METAL WATER LINE WITHIN 5' OF BUILDING ENTRY AS REQUIRED BY NEC.
2. REMOVE EXISTING FEEDER TO PANEL AND CONNECT NEW FEEDER TO LINE SIDE OF EXISTING MAIN CIRCUIT BREAKER OF PANEL.
3. PROVIDE NEW ATS AND GENERATOR REMOTE ANNUNCIATOR CONTROL WIRING IN EXISTING 1 1/2" CONDUIT. PROVIDE QUANTITY OF #14 AWG CONTROL CONDUCTORS AS RECOMMENDED BY GENERATOR MANUFACTURER.
4. REMOVE EXISTING FEEDERS TO PANELS "LA" AND "LB" AND CONNECT NEW FEEDER TO LOAD SIDE OF METER BASE.
5. 250 AMP, 2 POLE MAIN CIRCUIT BREAKER IN NEMA 3R ENCLOSURE INSIDE GENERATOR ENCLOSURE.
6. PROVIDE #2 GROUND TO GENERATOR CHASSIS AND TO NEW 5/8" X 10' COPPER CLAD STEEL DRIVEN GROUND ROD. BOND TO MAIN SERVICE GROUND.

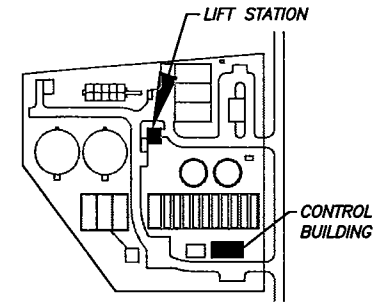
CONSTRUCTION PLAN SAMPLE  
 EXHIBIT 13  
 Page 4 of 4  
 New Document: Dec. 2004

REVISION NO.	DATE	BY	DESCRIPTION
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**EXHIBIT NO. 14**

**PLAN PROFILE**  
**and**  
**DEMOLITION**



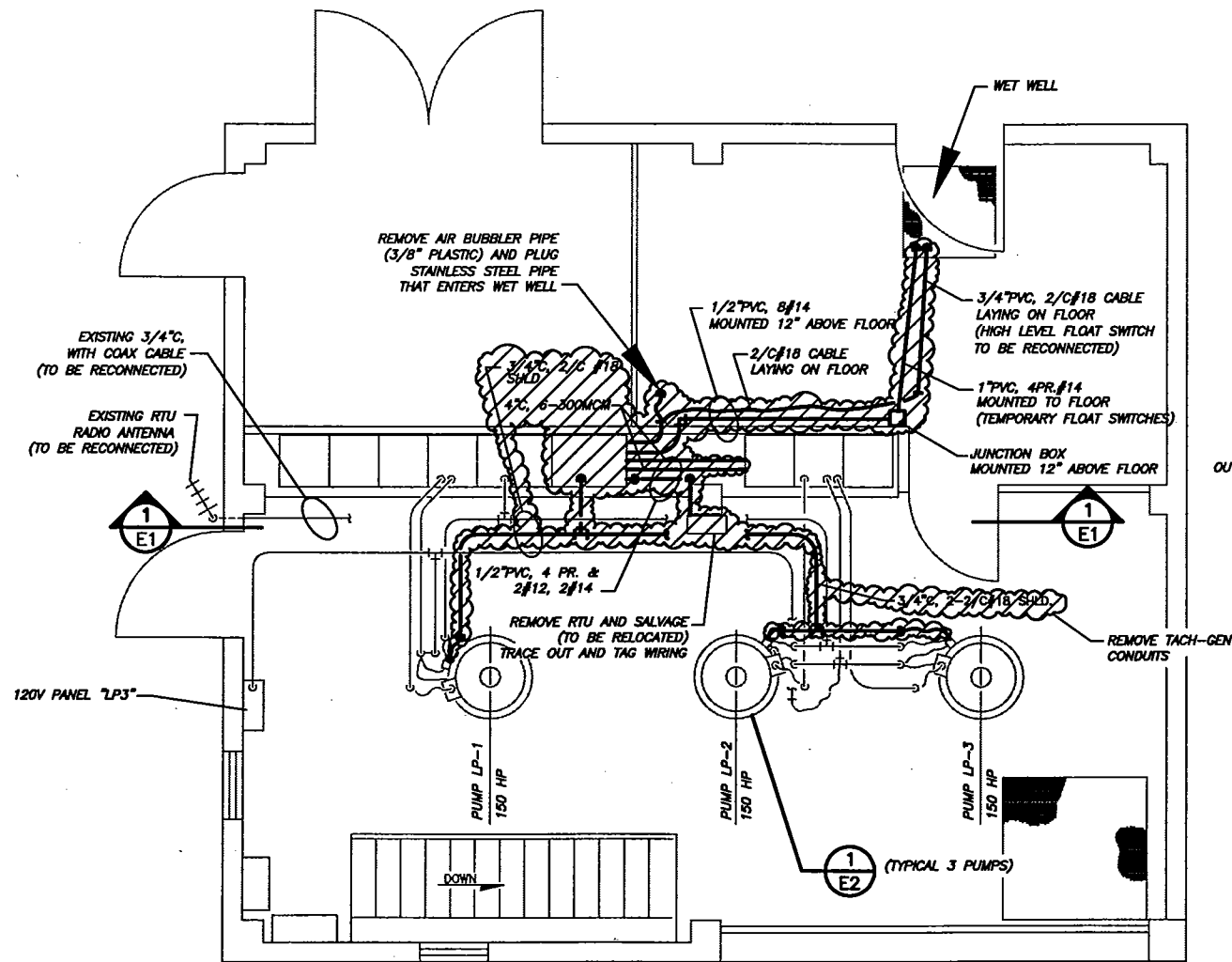
**ALLISON WWTp SITE PLAN**  
NOT TO SCALE

**LEGEND**

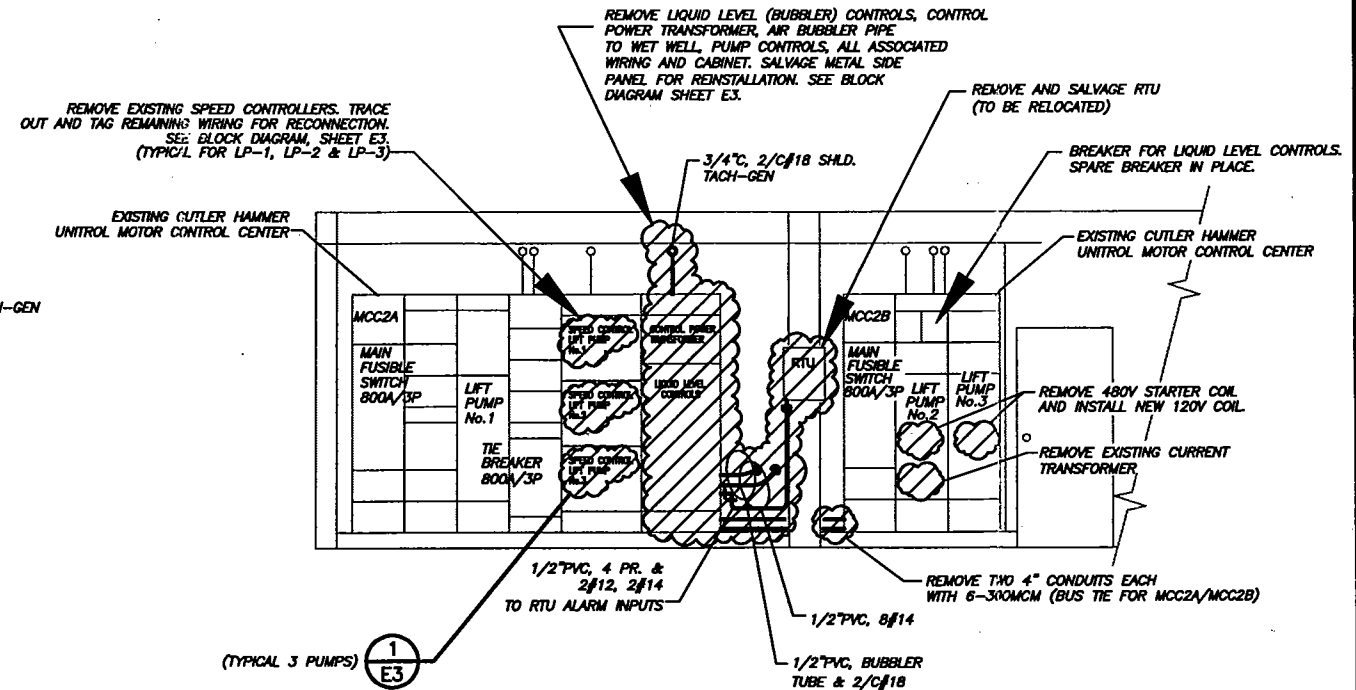
- INDICATES AREA OF DEMOLITION
- SECTION OR DETAIL IDENTIFICATION LETTER FOR SECTION NUMBER FOR DETAIL
- NUMBER OF SHEET ON WHICH CONDITION IS DRAWN
- DIRECTION IN WHICH SECTION IS TAKEN

**NOTE**

1. CONTRACTOR SHALL SUBMIT PROPOSED CONSTRUCTION SCHEDULE PRIOR TO COMMENCING WORK. PROVIDE TEMPORARY CONTROLS AS REQUIRED TO MAINTAIN TWO PUMPS IN OPERATION AT ALL TIMES.
2. CONTRACTOR SHALL COORDINATE WITH OPERATIONS DEPARTMENT ON ALL SEQUENCING AND FOR ALL EMERGENCY OPERATIONS.

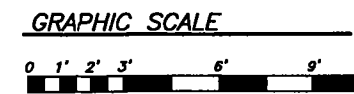


**LIFT STATION ELECTRICAL DEMOLITION PLAN**  
NOT TO SCALE



**MOTOR CONTROL CENTER ELEVATION**  
NOT TO SCALE

**EXHIBIT 14**  
Sheet 3 of 3  
"DEMOLITION"



01-19-2001

FILE: /MProject/anstas/atsample14-3.dwg

  
**CITY OF CORPUS CHRISTI**  
TEXAS  
Department of Engineering Services






**— SAMPLE —**  
**ELECTRICAL DEMOLITION PLAN**  
**AND MISCELLANEOUS DETAILS**

REVISION NO.    DATE    BY    DESCRIPTION

SHEET . . . of . . .  
RECORD DRAWING NO. . . . .  
CITY PROJECT # . . . . .



**LEGEND**

- UAT— EXISTING UNDERGROUND 3/8" AIR TUBING
- AT— EXISTING ABOVEGROUND 3/8" AIR TUBING
- T— EXISTING ABOVEGROUND 3/8" TUBING
- UC— NEW UNDERGROUND CONDUIT
- G— GROUNDING CONDUCTOR, #2 AWG
-  INDICATES AREA OF DEMOLITION
-  DENOTES INSTRUMENT AS PER ISA STANDARDS
-  TELEPHONE JACK
-  JUNCTION BOX
-  GROUND ROD, 3/4" x 10'-0", COPPER

SECTION OR DETAIL IDENTIFICATION LETTER FOR SECTION NUMBER FOR DETAIL

2  
E1 E2

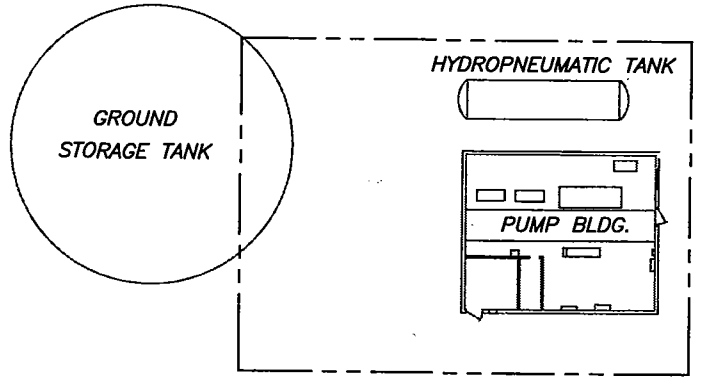
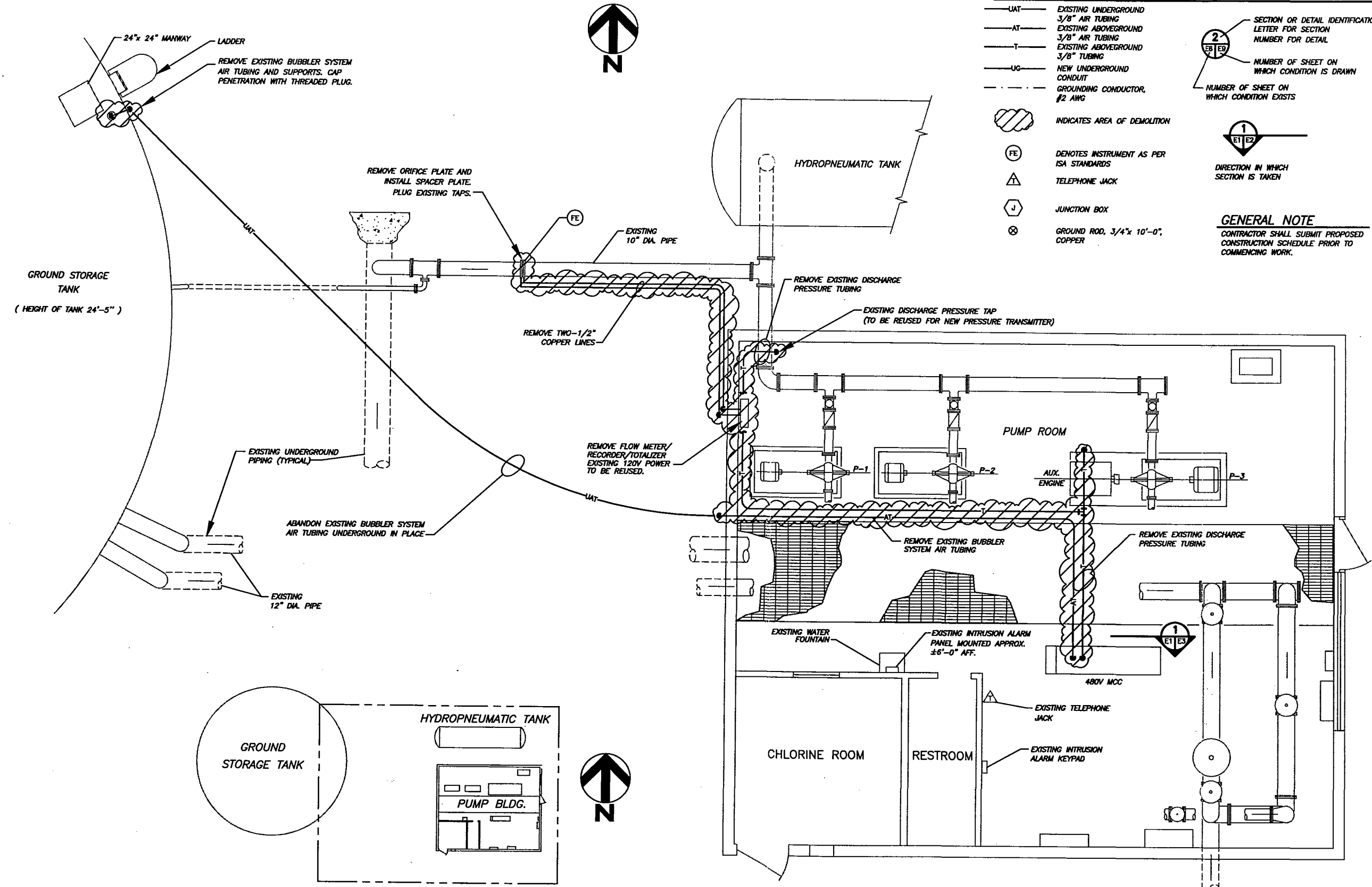
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NUMBER OF SHEET ON WHICH CONDITION EXISTS

1  
E1 E2

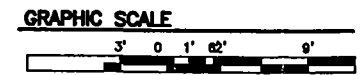
DIRECTION IN WHICH SECTION IS TAKEN

**GENERAL NOTE**  
CONTRACTOR SHALL SUBMIT PROPOSED CONSTRUCTION SCHEDULE PRIOR TO COMMENCING WORK.



**KEY PLAN**  
NOT TO SCALE

**EXISTING PUMP BUILDING DEMOLITION PLAN**  
NOT TO SCALE



**EXHIBIT 14**  
Sheet 2 of 3  
"DEMOLITION"

  
CITY OF CORPUS CHRISTI  
TEXAS  
Department of Engineering Services

— SAMPLE —  
DEMOLITION PLAN

REVISION NO.	DATE	BY	DESCRIPTION

SHEET . . . of . . .  
RECORD DRAWING NO.  
CITY PROJECT #

**EXHIBIT NO. 15**

**CITY STANDARD FOR:**

**SCADA**  
**DOCUMENTATION**

**(Provided upon Request)**



**SECOMA**



**CONCEPT : IMPROVE MAJOR PROJECT PROGRESS**

**SOLUTION : SECOMA**

(Safety, Environmental, Construction, Operation, Maintainability, & Ad Hoc)

**DISCUSSION:**

1. Set up Major Projects personnel in SECOMA along with Operating Department personnel. (The composition of SECOMA is flexible and project Dependent.)
2. Operating Department members would be selected by the Director of each Operating Department and would be the representative of that department on project reviews, intent of project discussions, and any other issues, which a particular department would want resolved. (Membership may at times include the extra upper management of the operating department.)
3. New to the Engineering Services review would be a member from the City Construction Inspection Division to bring input on constructability issues. (Depending upon availability, could be the head of the Construction Inspection Division.
4. Traffic, Land Acquisition, and other Divisions deemed necessary for any particular project would also be included in the review process.

**EXECUTIVE REVIEW :**

This concept would include the City Engineer, Operating Department Superintendent, and the Major Projects Activity Engineer directly responsible for any particular project being reviewed.

**LESSONS LEARNED :**

After project completion, SECOMA members, the executive review team, and others deemed as necessary would meet to critique and refine the project management process to assure continued improvement in the product produced for the customer.

**APPLICABILITY :**

This process would apply to all large city projects. This would include all projects in which the engineering fee was greater than \$15,000, all CIP/RFP/RFQ projects, and any other large project in which the review process is involved and various steps would be required to assure project intent and success are achieved. An alternate and less demanding method of review for small A/E projects (less than \$15,000 fee) could also benefit from the use of a similar process.

**SECOMA COMMITTEE MEMBERSHIP  
(Including Consultant)**

**1. Major Projects Activity Team Members:**

Joe Trejo	Mary Frances Teniente	Randal Stivers
Joe Cavalier	Tom Bacon	

**Operating Department Team Members (as applicable to project and assigned by the Director):**

**Water Department:**

For ONS WTP Projects: Frank Rodriguez or Mucio Garza

Other Water Projects: Danny Ybarra or Roy Ramirez

**Wastewater Department:**

Johnny Perales  
Cliff Beaber  
Steve Klepper

**Storm Water Department:**

Valerie Gray  
Ernesto Chavez

**Gas Department:**

Debbie Marroquin  
Kyle Dewald

**Solid Waste Department:**

Lawrence Mikolajck

**Street Department:**

Barbara Stover  
Jim Cockroft  
Andy Leal

**Park & Recreation**

Tony Cisneros  
Dan Whitworth

**Land Acquisition**

Sonny Garza

**Support Staff:**

June Mitschke  
Tony Zuniga

Vernon Wuensche  
Ce'sar Longoria

**2. Executive Review Committee Members:**

'Angel Escobar and either: (Dependent on the type of Project)

Eduardo Garana, Water  
Foster Crowell, Wastewater  
Valerie Gray, Storm Water  
Barbara Stover, Streets

Debbie Marroquin  
Tony Cisneros  
Lawrence Mikolajczyk

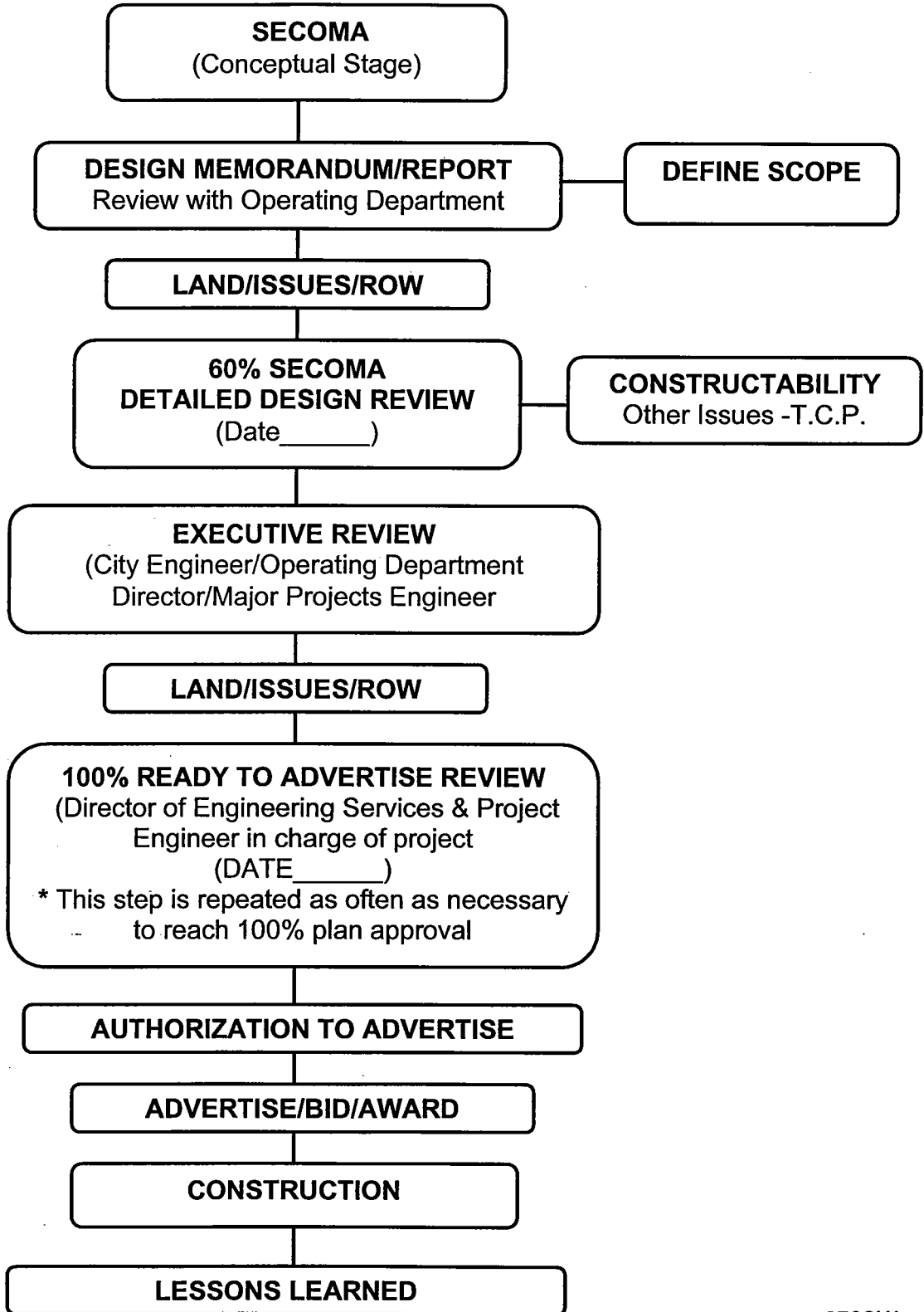
Including,

Joe Trejo, Major Projects Engineer, and

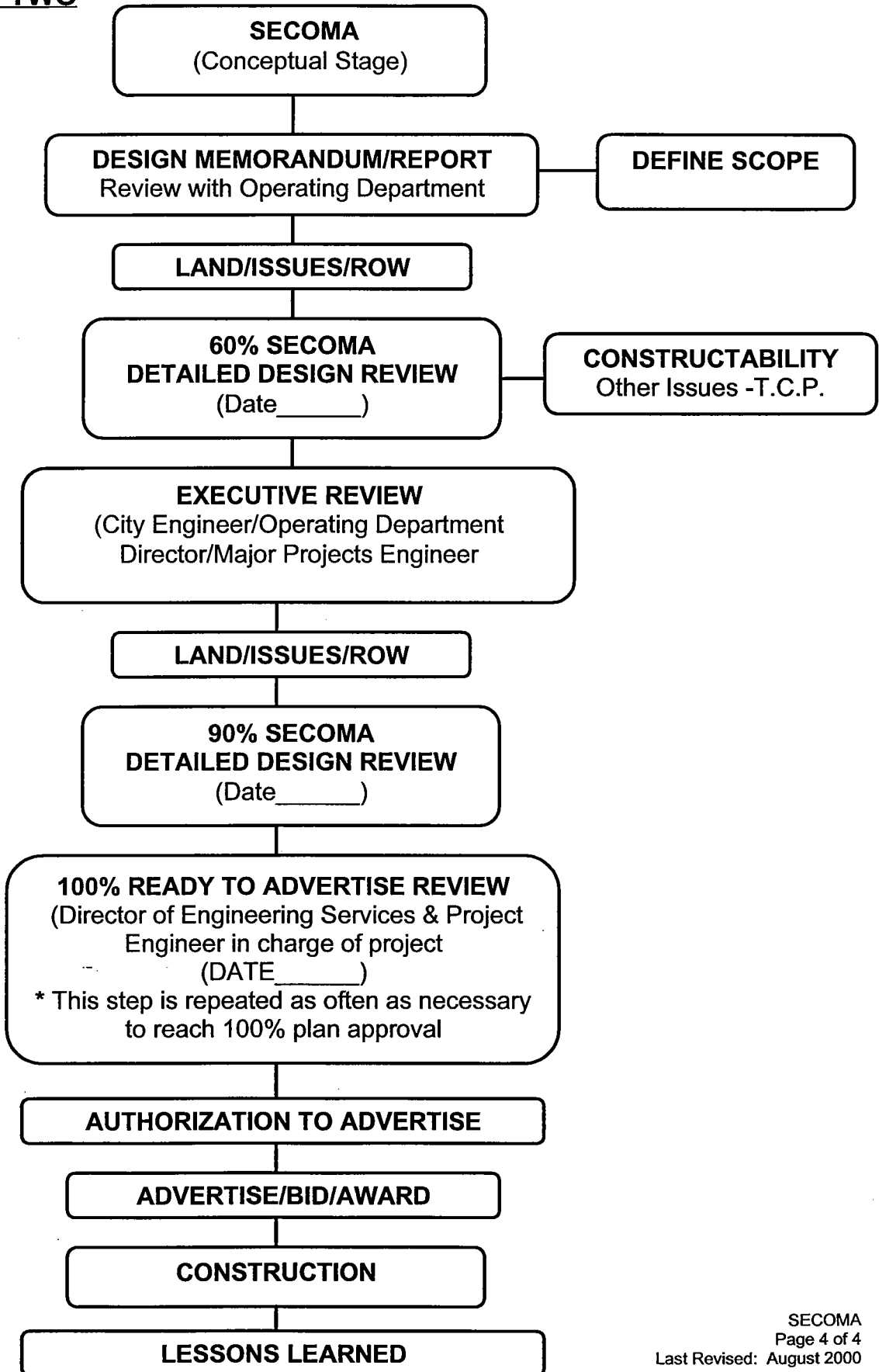
the Senior Engineer responsible for the particular project being reviewed, either:

Tom Bacon	Joe Cavalier	Mary Frances Teniente
-----------	--------------	-----------------------

**SECOMA REVIEW PROCESS  
OPTION ONE**



**SECOMA REVIEW PROCESS  
OPTION TWO**





**TAB FOUR**  
**SMALL A/E CONTRACT**  
**PACKAGE**

**(Attachment No. 10—Revised December 2004)**



## SAMPLE FORMS FOR SMALL A/E CONTRACTS

To all prospective A/E Consultants:

Attached are SAMPLE forms that will be part of all small A/E agreements with the City of Corpus Christi. The City will be responsible for preparing the actual agreement, while the consultant will be responsible for preparing Exhibit "A-P/S" or Exhibit "A-RPT", as applicable, for the City's approval and inclusion in the agreement. Exhibit "C" is a worksheet for Man-hour Breakdown for Services and Exhibit "D" is a sample of how all invoices are **required** to be prepared and submitted for City approval and payment.

The consultant will submit either Exhibit "A-P/S" or "A-RPT" for all proposed projects that will have A/E fees less than \$25,000. Exhibit "A-P/S" will be required for all small A/E contracts that require plan and specification preparatory work, while Exhibit "A-RPT" is applicable for small contracts that require an engineering report only. The SAMPLE exhibit forms list all basic services that are typically required for a project, but the A/E should adapt the scope to the specific requirements of the project being proposed. The Schedule and Fee must be included with all exhibits. When the A/E is preparing the appropriate Exhibit "A", **do not** delete any parts of the SAMPLE. Instead, strike out any provisions that are not applicable to the subject project.

The complete A/E agreement package will consist of:

- The Small A/E Agreement - to be prepared by the City;
- Exhibit "A-P/S" or Exhibit "A-RPT" (as applicable) to be prepared by the A/E; and,
- The City's *Disclosure of Interests* form.

Once all contract documents have been completed they will be submitted to the A/E for signatures and completion of the *Disclosure of Interests* form. Once all signatures have been affixed to the contract, one original will be sent to the A/E with a Notice to Proceed. The other originals will remain with the City.

### BIDDING PHASE DOCUMENTS

When developing specifications and bid documents, the Consultant must keep the font (10 pt. Courier or New Courier) used in the disks provided by the City. Using the same format maintains consistent page numbering which facilitates the City's review and reduces the chance of error. **The A/E Consultant shall use the *City of Corpus Christi Plan Preparation Standards* for all plans, specifications, and preparation of contract documents.**

### DELIVERABLES

All plans, specifications, bid documents and drawings will be submitted in hard copy and digitized format. All text is to be in approved City format and drawings are to be in AutoCAD Release 2002 or earlier revision.

**SMALL A/E  
AGREEMENT  
for  
Architect/Engineer Consultant Services**

This AGREEMENT is between the City of Corpus Christi, Texas, a Texas home-rule municipal corporation, "CITY", acting through its duly authorized City Manager or designee ("City Engineer"), and **ABC ENGINEERING, INC.** a Texas corporation, acting through its duly authorized representative who is **John Doe, P.E., President** (CONSULTANT), which agree as follows:

1. **DECLARATIONS.** "CITY" desires to engage "CONSULTANT" to provide services in connection with City's project, described as follow: **Water Department SCADA Master Plan** "Project".

2. **SCOPE OF WORK.** "CONSULTANT" shall provide services for the PROJECT in accordance with the accompanying Letter, Scope of Services, and Fee attached as "Exhibit A".

3. **FEE.** The "CITY" agrees to pay the "CONSULTANT" for services provided in accordance with Exhibit "A", Scope of Services, and Fee under this AGREEMENT, a total fee not to exceed **\$24,915.00** (in figures), (**Twenty Four Thousand Nine Hundred Fifteen Dollars and Zero Cents**) (in words).

4. **INVOICE.** "CONSULTANT" shall submit invoices for the PROJECT in accordance with the accompanying Sample attached as "Exhibit C". For services provided in the Preliminary Phase, Design Phase, and Bid Phase, "CONSULTANT" will submit monthly invoice statements for services rendered. For services provided in the Construction Phase, the invoice statement will be based upon the percent of completion of the construction contract. "CITY" will make prompt monthly payments in response to "CONSULTANT" monthly estimates.

**CITY OF CORPUS CHRISTI**

**ABC ENGINEERING, INC.**

\_\_\_\_\_  
Ronald F. Massey (Date)  
Assistant City Manager

\_\_\_\_\_  
John Doe, P. E., President (Date)

1760 East River Road, Suite 301  
Corpus Christi, TX 78400  
(361) 555-5555 Office  
(361) 555-5565 Fax

**APPROVED AS TO FORM:**

\_\_\_\_\_  
Director of Engineering Services (Date)

\_\_\_\_\_  
Legal Department (Date)

\_\_\_\_\_  
Operating Department (Date)

Project Number: \_\_\_\_\_  
Funding Source: \_\_\_\_\_  
Encumbrance Number: \_\_\_\_\_



Date

Mr. Joe Trejo, P.E., Acting Asst. Director of Engineering Services  
City of Corpus Christi  
Engineering Services  
P.O. Box 9277  
Corpus Christi, TX 78469-9277

**FOR ENGINEERING REPORTS ONLY**

**Re: Official City Project Name**      *must accompany all correspondence*  
**(Project No. xxxx)**                      *must accompany all correspondence*

Dear Mr. Trejo:

Please accept this letter as our proposal to perform the professional services desired in developing a report for \_\_\_\_\_ project.

**Report Description and Task List:**

*Provide a one or two paragraph description of the project and listing of the tasks to be performed here.*

**Scope of Services:**

Engineering Report. The Architect/Engineer will provide a study and report of the project scope with an economic and technical evaluation of alternatives resulting in an Engineering Report. Included in the report will be the Preliminary designs, preliminary drawings, and written description of the project. Services to be included in the developing the report include:

1. Preparation of scope of soil investigations, borings, and laboratory testing. (The City Engineering Services Department will provide necessary soil investigation and testing under one or more separate contracts).
2. Confer with the City staff regarding the design parameters of the Project. The A/E will participate in discussions with the operating department and other agencies as required to satisfactorily complete the Project.
3. Submit, in an approved electronic format, one paper copy of the Engineering Report, with executive summary, opinion of probable construction cost with life cycle analysis, defined technical evaluations of identified feasible alternatives, and review with City staff to produce an acceptable format which contains common municipal elements. The Engineering Report will include the following (with **CONSTRUCTABILITY** being a major element in all the following items):

- a. Review of the Project with the respective Operating Department(s) and participation in discussions concerning clarification and definition of intent and execution of the Project. The A/E will meet with City staff to collect data, discuss materials and methods of construction, and identify design and construction requirements.
- b. Review and investigation of available records, archives, and pertinent data related to the Project including taking photographs of the Project site, list of potential problems and possible conflicts, intent of design, and improvements required, and conformance to relevant Master Plan(s).
- c. Identify results of site field investigation including site findings, existing conditions, and probable project design solutions which are common to municipalities.
- d. Provide a presentation of factors, sketches, designs, cross-sections, and parameters which will or may impact the design, including engineering design bases, preliminary layout sketches, identification of needed additional services, preliminary details of construction of critical elements, identification of needed permits, identification of specifications to be used, identification of quality and quantity of materials of construction, identification of right-of-way and easements needed, for a professional design (CONSTRUCTABILITY).
- e. Identify environmental site evaluations and archeology reports that are needed for the Project (Environmental assessments and archeological services to be an Additional Service).
- f. Identify and analyze requirements of governmental authorities having jurisdiction to approve design of the Project, permitting, environmental, historical, construction, and geotechnical issues; and meet with pertinent authorities.
- g. Confer, discuss, and meet with City operating department(s) and Engineering Services staff as needed to produce a cohesive, well-defined proposed scope of design, probable cost estimates(s) and design alternatives.
- h. Provide an analysis on project impacts towards "re-engineering" and effects on cost savings toward City operations, which this project will affect.

**Schedule:**

1. Preliminary Submittal Due	__ weeks from Notice To Proceed (NTP) (_____, 2003)
2. Final Submittal Due	Until Final Acceptance by City

**Fees:**

**A. Fees for A/E services include:**

- The necessary conferences and site visits for the preparation and execution of the Engineering Report preparation outlined herein.

**B. City of Corpus Christi Shall Supply or Reimburse the Following:**

- All available base and/or site maps from City Engineering files
- Existing city utility layouts (water, wastewater, gas and drainage) from City Engineering files
- All fees for reviews and/or inspections from Regulatory Agencies
- All printing and reproduction cost [through City approved vendor]

**C. Summary of A/E Fees**

1. Preliminary Submittal – 70% Fee Due	\$
2. Final Submittal –30% Fee Due	\$
<b>TOTAL FEE</b>	<b>\$</b>

Sincerely,

\_\_\_\_\_  
Firm Officer Entitled to Enter Contracts

Date

Mr. Joe Trejo, P.E., Acting Asst. Director of Engineering Services  
City of Corpus Christi  
Department of Engineering Services  
P.O. Box 9277  
Corpus Christi, TX 78469-9277

**FOR PLAN AND SPECIFICATION PREPARATION**

**SUBJECT: Official City Project Name**      *must accompany all correspondence*  
**(Project No. \_\_\_\_\_)**                      *must accompany all correspondence*

Dear Mr. Trejo:

Please accept this letter as our proposal to perform the professional services desired in developing \_\_\_\_\_ project. It is understood that the target construction funds are \$\_\_\_\_\_.

**Project Description and Task List:**

*Provide a one or two paragraph description of the project and listing of the tasks to be performed here. (Include intent of design.)*

**Scope of Services:**

- |   |
|---|
| <p><b>1. Preliminary Phase</b></p> <ul style="list-style-type: none"><li>• Confirm, evaluate, and field-verify existing site conditions. [City will provide record information and data as available from City Engineering files.]</li><li>• Meet as needed with City staff and other Agencies to define the project concept and identify any permitting or land acquisition requirements.</li><li>• Review and study the project scope and proposed budget as they relate to construction feasibility.</li><li>• Review previously developed sketches, designs and/or engineering reports provided by City.</li><li>• When required, submit written preliminary engineering letter report(s) for City review and approval.</li><li>• Assimilate all review comments, modifications, additions/deletions and proceed to next phase, upon Notice to Proceed.</li></ul> |
|---|

## 2. Design Phase

### Required

- **Develop and submit for review the Interim set** of the plans, (no specifications or bid documents) with layout of the plans in the City of Corpus Christi's preferred format. **Must comply with the *City of Corpus Christi Plan Preparation Standards*.**
- Furnish one (1) set plans to the City of Corpus Christi for review and comment. The City shall assume cost for reproduction of additional sets.
- Develop and submit an opinion of probable construction cost for the project improvements.
- Assimilate all review comments, modifications, additions/deletions and proceed to next phase, upon written Notice to Proceed.

### Optional, at City Discretion

- **Prepare and submit for review the Pre-Final set** of the construction drawings, plans, details, contract documents, technical specifications, and bid documents in accordance with the City of Corpus Christi's preferred format.
- Provide the marked-up interim review set so the City may determine that the comments were incorporated into the pre-final set.
- Furnish one (1) set plans to the City of Corpus Christi for review and comment. The City shall assume cost for reproduction of additional sets.
- Develop and submit for review an opinion of probable construction costs within the pre-determined budget constraint or,
- Recommend probable alternative bid items that may be needed to ensure that the lowest responsible bid can be awarded within budget.
- Assimilate all review comments, modifications, additions/deletions, and proceed to the final phase, upon Notice to Proceed.

### Required

- **Complete and submit the complete Final set** of construction drawings, plans, details, contract documents, technical specifications, and bid documents in accordance with the City of Corpus Christi's preferred standard format.
- Provide the marked-up of the pre-final review set (if applicable, otherwise provide the marked-up of the interim review set) so the City may determine that the comments were incorporated into the final set.
- Provide the final opinion of probable construction cost.
- Provide final alternative bid items that may be needed to ensure that the lowest responsible bid is within budget.
- Furnish the City with both a reproducible set of plans with specifications and bid documents for the bidding process, as well as the full documents in electronic format.

- Prepare and submit documents to regulatory agencies having jurisdiction like TDLR, TNRCC, TxDOT, etc. for review. Prepare required permits and agreements. Any permit fees shall be paid by the City of Corpus Christi directly.

### **3. Bid Phase**

- Attend the pre-bid conference chaired by City and assist City in defining, clarifying, and responding to bidder questions with respect to project design, specifications, materials, and methods.
- Prepare addenda, in preferred City format, necessary to inform contractors of modifications and clarifications prior to bid date. The City's Engineering Services will distribute any addendum.
- Attend the bid opening, tabulate bids according to the City Engineering Services preferred standard format, and make recommendations concerning award.

### **4. Construction Phase**

- Attend and participate at the pre-bid and pre-construction conferences, which will be chaired by Engineering Services.
- Provide record drawings from contractor-prepared redlined marked-up set of construction documents.
- Coordinate with the City inspector to authorize minor field alterations that do not affect the contractor's price and are not contrary to the interest of the City.
- Conduct a "final inspection" with City and Contractor, and make a recommendation concerning final acceptance.

### **5. Additional Services**

- Visit the site/confer with City's Construction Inspector and Contractor to observe the progress and quality of work, and to determine, in general, whether the work is accordance with project design.
- Review and approve all contractor's shop drawings and/or submittals.
- Coordinate necessary change orders during the process of the work. City will prepare and process all change orders.
- Review and approve all proposed layouts, lines, levels, and elevations prior to installation or construction to assure project design and intent.
- Review the contractors' progress payment request and approved schedule of work before submission to the City for processing.
- Provide record drawings, in electronic format, of the project.
- Permit Preparation.
- Daily Progress Reports

### **Project Schedule:**

DAY	DATE	ACTIVITY
Wednesday		Begin Preliminary Phase
Monday		Begin Design Phase
Friday		Interim Submittal
Friday		City Review
Friday		Pre-Final Submittal
Friday		City Review
Friday		Final Submittal
Monday (2)		Advertise for Bids
Tue/Wed/Thu		Pre-Bid Conference
Wednesday		Receive Bids
Monday		Begin Construction
Weekday		Construction Completion

**Fees:**

**A. Fees for A/E services include:**

- The necessary conferences and site visits for the preparation and execution of all phases outlined herein.
- The production of construction and bidding documents in accordance with the City format.

**B. City of Corpus Christi Shall Supply or Reimburse the Following:**

- All available base and/or site maps from City Engineering files
- Existing city utility layouts (water, wastewater, gas and drainage)
- Approval of preliminary conceptual designs and sketches
- All fees for reviews and/or inspections from Regulatory Agencies
- All printing and reproduction cost [through City approved vendor]

**C. Summary of A/E Fees**

1. Preliminary Phase – 40% Fee Due	\$
2. Design Phase – 45% Fee Due	\$
3. Bid Phase – 5% Fee Due	\$
4. Construction Phase – 10% Fee Due	\$

5. Optional Services	\$
<b>TOTAL FEE</b>	<b>\$</b>

Sincerely,

\_\_\_\_\_  
Firm Officer Entitled to Enter Contracts





**CITY OF CORPUS CHRISTI  
DISCLOSURE OF INTERESTS**

City of Corpus Christi Ordinance 17112, as amended, requires all persons or firms seeking to do business with the City to provide the following information. Every question must be answered. If the question is not applicable, answer with "NA"

**FIRM NAME:** \_\_\_\_\_

**STREET:** \_\_\_\_\_ **CITY:** \_\_\_\_\_ **ZIP:** \_\_\_\_\_

**FIRM is:** 1. Corporation \_\_\_\_\_ 2. Partnership \_\_\_\_\_ 3. Sole Owner \_\_\_\_\_ 4. Association \_\_\_\_\_  
5. Other \_\_\_\_\_

**DISCLOSURE QUESTIONS**

If additional space is necessary, please use the reverse side of this page or attach separate sheet.

**1. State the names of each "employee" of the City of Corpus Christi having an "ownership interest" constituting 3% or more of the ownership in the above named "firm".**

Name \_\_\_\_\_ Job Title and City Department (if known) \_\_\_\_\_  
\_\_\_\_\_

**2. State the names of each "official" of the City of Corpus Christi having an "ownership interest" constituting 3% or more of the ownership in the above named "firm".**

Name \_\_\_\_\_ Title \_\_\_\_\_  
\_\_\_\_\_

**3. State the names of each "board member" of the City of Corpus Christi having an "ownership interest" constituting 3% or more of the ownership in the above named "firm".**

Name \_\_\_\_\_ Board, Commission or Committee \_\_\_\_\_  
\_\_\_\_\_

**4. State the names of each employee or officer of a "consultant" for the City of Corpus Christi who worked on any matter related to the subject of this contract and has an "ownership interest" constituting 3% or more of the ownership in the above named "firm".**

Name \_\_\_\_\_ Consultant \_\_\_\_\_  
\_\_\_\_\_

**CERTIFICATE**

I certify that all information provided is true and correct as of the date of this statement, that I have not knowingly withheld disclosure of any information requested; and that supplemental statements will be promptly submitted to the City of Corpus Christi, Texas as changes occur.

Certifying Person: \_\_\_\_\_ Title: \_\_\_\_\_  
(Type or Print)

Signature of Certifying Person: \_\_\_\_\_ Date: \_\_\_\_\_

## **DEFINITIONS**

- a. "Board Member". A member of any board, commission or committee appointed by the City Council of the City of Corpus Christi, Texas.
- b. "Employee". Any person employed by the City of Corpus Christi, Texas, either on a full or part time basis, but not as an independent contractor.
- c. "Firm". Any entity operated for economic gain, whether professional, industrial or commercial and whether established to produce or deal with a product or service, including but not limited to, entities operated in the form of sole proprietorship, as self-employed person, partnership, corporation, joint stock company, joint venture, receivership or trust and entities which, for purposes of taxation, are treated as non-profit organizations.
- d. "Official". The Mayor, members of the City Council, City Manager, Deputy City Manager, Assistant City Managers, Department and Division Heads and Municipal Court Judges of the City of Corpus Christi, Texas.
- e. "Ownership Interest". Legal or equitable interest, whether actually or constructively held, in a firm, including when such interest is held through an agent, trust, estate or holding entity. "Constructively held" refers to holding or control established through voting trusts, proxies or special terms of venture or partnership agreements.
- f. "Consultant". Any person or firm, such as engineers and architects, hired by the City of Corpus Christi for the purpose of professional consultation and recommendation.

**COMPLETE PROJECT NAME**  
**Project No. XXXX**  
**Invoice No. 12345**  
**Invoice Date:**

	<b>Contract</b>	<b>Amd No. 1</b>	<b>Amd No. 2</b>	<b>Total Contract</b>	<b>Amount Invoiced</b>	<b>Previous Invoice</b>	<b>Total Invoice</b>	<b>Percent Complete</b>
<b>Basic Services:</b>								
Preliminary Phase	\$1,000	\$0	\$0	\$1,000	\$0	\$1,000	\$1,000	100%
Design Phase	2,000	1,000	0	3,000	1,000	500	1,500	50%
Bid Phase	500	0	250	750	0	0	0	0%
Construction Phase	2,500	0	1,000	3,500	0	0	0	0%
<b>Subtotal Basic Services</b>	<b>\$6,000</b>	<b>\$1,000</b>	<b>\$1,250</b>	<b>\$8,250</b>	<b>\$750</b>	<b>\$1,500</b>	<b>\$2,500</b>	<b>30%</b>
<b>Additional Services:</b>								
Permitting	\$2,000	\$0	\$0	\$2,000	\$500	\$0	\$500	25%
Warranty Phase	0	1,120	0	1,120	0	0	0	0%
Inspection	0	0	1,627	1,627	0	0	0	0%
Platting Survey	TBD	TBD	TBD	TBD	TBD	TBD	TBD	0%
O & M Manuals	TBD	TBD	TBD	TBD	TBD	TBD	TBD	0%
SCADA	TBD	TBD	TBD	TBD	TBD	TBD	TBD	0%
<b>Subtotal Additional Services</b>	<b>\$2,000</b>	<b>\$1,120</b>	<b>\$1,627</b>	<b>\$4,747</b>	<b>\$500</b>	<b>\$0</b>	<b>\$500</b>	<b>11%</b>
<b>Summary of Fees</b>								
Basic Services Fees	\$6,000	\$1,000	\$1,250	\$8,250	\$750	\$1,500	\$2,500	30%
Additional Services Fees	2,000	1,120	1,627	4,747	500	0	500	11%
<b>Total of Fees</b>	<b>\$8,000</b>	<b>\$2,120</b>	<b>\$2,877</b>	<b>\$12,997</b>	<b>\$1,250</b>	<b>\$1,500</b>	<b>\$3,000</b>	<b>23%</b>



**AMENDMENT NO. 1  
TO  
SMALL A/E  
AGREEMENT  
FOR  
ARCHITECT/ENGINEER CONSULTANT SERVICES**

This City of Corpus Christi, Texas hereinafter called "CITY", and **Exceptional Engineering Company, Inc.**, hereinafter called "Engineer", agree to the following amendments to the Contract for Engineering Services for Geriatric Park Senior Center Facility, as authorized and administratively amended by:

Original Small A/E Agreement	February 6, 2001	Administrative Approval	\$6,000
------------------------------	------------------	-------------------------	---------

1. **DECLARATIONS.** "CITY" desires to engage "CONSULTANT" to provide services in connection with City's project, described as follow: **Geriatric Park Senior Center Facility** "Project".

2. **SCOPE OF WORK.** "CONSULTANT" shall provide services for the PROJECT in accordance with the accompanying Letter, Scope of Services, and Fee attached as "Exhibit A". **Section 2. Design Phase is amended to include required visual inspections and complete and seal necessary forms for the Texas Department of Insurance Windstorm Certification through completion of the items of work remaining.**

3. **FEE.** The "CITY" agrees to pay the "CONSULTANT" for services provided in accordance with Exhibit "A", Scope of Services, and Fee under this AMENDMENT NO. 1, a total fee not to exceed **\$600.00** (in figures), (**Six Hundred Dollars and Zero Cents**) (in words), for a total restated fee not to exceed **\$6,600.00** (in figures), (**Six Thousand Six Hundred Dollars and Zero/Cents**) (in words).

4. **INVOICE.** "CONSULTANT" shall submit invoices for the PROJECT in accordance with the accompanying Sample attached as "Exhibit C". For services provided in the Preliminary Phase, Design Phase, and Bid Phase, "CONSULTANT" will submit monthly invoice statements for services rendered. For services provided in the Construction Phase, the invoice statement will be based upon the percent of completion of the construction contract. "CITY" will make prompt monthly payments in response to "CONSULTANT" monthly estimates.

**CITY OF CORPUS CHRISTI**

**EXCEPTIONAL ENGINEERING COMPANY, INC.**

\_\_\_\_\_  
Ronald F. Massey (Date)  
Assistant City Manager

\_\_\_\_\_  
John Doe, P. E., President (Date)

1234 Main Street, Suite 300  
Corpus Christi, TX 78444  
(361) 888-1234 Office  
(361) 888-5678 Fax

**APPROVED AS TO FORM:**

\_\_\_\_\_  
Director of Engineering Services (Date)

\_\_\_\_\_  
Legal Department (Date)

\_\_\_\_\_  
Operating Department (Date)

Project Number: \_\_\_\_\_  
Funding Source: \_\_\_\_\_  
Encumbrance Number: \_\_\_\_\_



**TAB FIVE**  
**LARGE A/E CONTRACT**  
**PACKAGE**

**(Attachment No. 11—Revised December 2004)**



## SAMPLE FORMS FOR LARGE A/E CONTRACTS

To all prospective A/E Consultants:

Attached are SAMPLE forms that will be part of all large A/E agreements with the City of Corpus Christi. The City will be responsible for preparing the actual contract, while the consultant will be responsible for preparing **both** Exhibit "A" and Exhibit "A-1" (task list) for the City's approval and inclusion in the contract. **Additional** documents attached to assist you include:

- Exhibit "B" which is a copy of the Insurance Requirements required by the City of Corpus Christi;
- Exhibit "C" the City's *Disclosure of Interest* form;
- Exhibit "D" a sample of how all invoices are **required** to be prepared and submitted for City approval and payment; and
- Exhibit "E" a worksheet for Man-hour Breakdown for Services.

The consultant will submit, in both hard copy and approved electronic format, Exhibit "A" and Exhibit "A-1" for all proposed projects that will have A/E fees greater than \$25,000. The SAMPLE exhibit forms list all basic services that are typically required for a project, but the A/E should adapt the scope to the specific requirements of the project being proposed.

The Schedule and Fee must be included with all exhibits. When the A/E is preparing the Exhibit "A", **do not** delete any parts of the SAMPLE. Instead, strike out any provisions that are not applicable to the subject project. The enclosed Exhibit "A-1" is a sample document and it is intended the A/E will use this exhibit as a guideline to develop an applicable Task List.

The complete A/E Contract package presented to Council will consist of:

- The Large A/E Contract - to be prepared by the City;
- Exhibit "A" and Exhibit "A-1" to be prepared by the A/E;
- Exhibit "B" The City's Insurance Requirements
- Exhibit "C" The City's *Disclosure of Interests* form.
- Exhibit "D" Invoice Sample

Once all contract documents have been completed they will be submitted to the A/E for signatures and completion of the *Disclosure of Interests* form. Once all signatures have been affixed to the contract, one original will be sent to the A/E with a Notice to Proceed. The other originals will remain with the City.

## **BIDDING PHASE DOCUMENTS**

When developing specifications and bid documents, the Consultant must keep the font used in the disks provided by the City. Using the same format maintains consistent page numbering which facilitates the City's review and reduces the chance of error. **The A/E Consultant shall use the *City of Corpus Christi Plan Preparation Standards* for all plans, specifications, and preparation of contract documents.**

## **DELIVERABLES**

All plans, specifications, bid documents and drawings will be submitted in hard copy and electronic format. All text is to be in approved City format and drawings are to be in AutoCAD Release 2002 or earlier revision.



# CITY OF CORPUS CHRISTI

## CONTRACT FOR PROFESSIONAL SERVICES

The City of Corpus Christi, a Texas home rule municipal corporation, P.O. Box 9277, Corpus Christi, Nueces County, Texas 78469-9277 (City) acting through its duly authorized City Manager or Designee (Director of Engineering Services) and **New Company, Inc.**, a Texas corporation, 1234 Broadway, Suite 000, Corpus Christi, Nueces County, Texas 78123, (**Architect/Engineer – A/E**), hereby agree as follows:

### 1. SCOPE OF PROJECT (place title of contract and project number here)

Numerous repairs have been made to this 42 year-old line due to settlement, broken pipe joints, and joint separation. This project proposes the rehabilitation of 4,700 feet of trunk main in Highland Road from the Airport Ditch to Anywhere Drive.

In 1993, the section of 24 inch concrete trunk line from the City Lift Station to Memorial High School was replaced by a 12 inch force main. The remaining section of clay line has settled in several locations. Phase 1 of the Staples project involves the rehabilitation of the line between Memorial High School and Town Lane. Phase 2 will rehabilitate the 24 inch clay trunk main from Town Lane to the Downtown Lift Station.

### 2. SCOPE OF SERVICES

The A/E hereby agrees, at its own expense, to perform design services necessary to review and prepare plans, specifications, and bid and contract documents. In addition, A/E will provide monthly status updates (project progress or delays, gantt charts presented with monthly invoices) and provide contract administration services, as described in **Exhibit "A" and "A-1"**, to complete the Project. **Exhibit "A-1" provides supplemental description of services to Exhibit "A" and does not intended to supersede services described in Exhibit "A"**. Work will not begin on Additional Services until requested by the A/E (provide breakdown of costs, schedules), and written authorization is provided by the Director of Engineering Services.

A/E services will be "Services for Construction Projects"- (Basic Services for Construction Projects") which are shown and are in accordance with "Professional Engineering Services-A Guide to the Selection and Negotiation Process, 1993" a joint publication of the Consulting Engineer's Council of Texas and Texas Society of Professional Engineers. For purposes of this contract, certain services listed in this publication as Additional Services will be considered as Basic Services.

### 3. ORDER OF SERVICES

The A/E agrees to begin work on those authorized Basic Services for this contract upon receipt of the Notice to Proceed from the Director of Engineering Services. Work will not begin on any phase or any Additional Services until requested in writing by the A/E and written authorization is provided by the Director of Engineering Services. The anticipated schedule of the preliminary phase, design phase, bid phase, and construction phase is

shown on **Exhibit "A"**. This schedule is not to be inclusive of all additional time that may be required for review by the City staff and may be amended by or with the concurrence of the Director of Engineering Services.

The Director of Engineering Services may direct the A/E to undertake additional services or tasks provided that no increase in fee is required. Services or tasks requiring an increase of fee will be mutually agreed and evidenced in writing as an amendment to this contract. A/E shall notify the City of Corpus Christi within three (3) days of notice if tasks requested requires an additional fee.

#### 4. MANDATORY REQUIREMENTS

A/E agrees to the mandatory contract and insurance requirements as set forth in **Exhibit "B"**.

#### 5. FEE

The City will pay the A/E a fee, as described in **Exhibit "A"**, for providing services authorized. Monthly invoices will be submitted in accordance with **Exhibit "D"**.

#### 6. TERMINATION OF CONTRACT

The City may, at any time, with or without cause, terminate this contract upon seven days written notice to the A/E at the address of record. In this event, the A/E will be compensated for its services on all stages authorized based upon A/E and City's estimate of the proportion of the total services actually completed at the time of termination.

#### 7. LOCAL PARTICIPATION

The City Council's stated policy is that City expenditures on contracts for professional services be of maximum benefit to the local economy. The A/E agrees that at least 75% of the work described herein will be performed by a labor force residing within the Corpus Christi Metropolitan Statistical Area (MSA). Additionally, no more than 25% of the work described herein will be performed by a labor force residing outside the Corpus Christi Metropolitan Statistical Area (MSA.)

#### 8. ASSIGNABILITY

The A/E will not assign, transfer or delegate any of its obligations or duties in this contract to any other person without the prior written consent of the City, except for routine duties delegated to personnel of the A/E staff. If the A/E is a partnership, then in the event of the termination of the partnership, this contract will inure to the individual benefit of such partner or partners as the City may designate. No part of the A/E fee may be assigned in advance of receipt by the A/E without written consent of the City.

The City will not pay the fees of expert or technical assistance and consultants unless such employment, including the rate of compensation, has been approved in writing by the City.



**EXHIBIT A  
CITY OF CORPUS CHRISTI, TEXAS**

**1. SCOPE OF SERVICES**

**A. Basic Services.**

**Basic Services will include the following in addition to those items shown on Exhibit "A-1" Task List.**

**1. Preliminary Phase. The Architect/Engineer-A/E will:**

It is the intent of the Preliminary Phase to provide a study and report of project scope with economic and technical evaluation of alternatives, and upon approval, proceed in a (\_\_\_\_\_) **design memorandum or letter engineering report** which includes Preliminary designs, drawings, and written description of the project. This report shall include:

- a. Provide scope of soil investigations, borings, and laboratory testing. (The City Engineering Services Department will provide necessary soil investigation and testing under one or more separate contracts).
- b. Confer with the City staff regarding the design parameters of the Project. The Engineer will participate in a minimum of (\_\_\_\_\_) formal meetings with City staff, provide agenda and purpose for each formal meeting; document and distribute meeting minutes and meeting report within seven (7) working days of the meeting. The A/E will participate in discussions with the operating department and other agencies (such as the Texas Department of Transportation (TxDOT) and Texas Commission of Environmental Quality (TCEQ)) as required to satisfactorily complete the Project.
- c. Submit one (1) copy in an approved electronic format, and **one (1)** paper copies of the Design Memorandum (or Engineering Report), with executive summary, opinion of probable construction costs with life cycle analysis, defined technical evaluations of identified feasible alternatives, and review with City staff to produce an acceptable format which contains common municipal elements. Design Memorandum will include the following (with **CONSTRUCTABILITY** being a major element in all the following items):
  - 1) Review of the Project with the respective Operating Department(s) and discussions including clarification and definition of intent and execution of the Project; The A/E will meet with City staff to collect data, discuss materials and methods of construction, and identify design and construction requirements.
  - 2) Review and investigation of available records, archives, and pertinent data related to the Project including taking photographs of the Project site, list of potential problems and possible conflicts,

- intent of design, and improvements required, and conformance to relevant Master Plan(s).
- 3) Identify results of site field investigation including site findings, existing conditions, potential right of way/easements, and probable Project design solutions; (which are common to municipalities).
  - 4) Provide a presentation of pertinent factors, sketches, designs, cross-sections, and parameters which will or may impact the design, including engineering design basis, preliminary layout sketches, identification of needed additional services, preliminary details of construction of critical elements, identification of needed permits, identification of specifications to be used, identification of quality and quantity of materials of construction, and other factors required for a professional design (CONSTRUCTABILITY).
  - 5) Advise of environmental site evaluations and archeology reports that are needed for the Project (Environmental issues and archeological services to be an Additional Service).
  - 6) Identify and analyze requirements of governmental authorities having jurisdiction to approve design of the Project and permitting, environmental, historical, construction, and geotechnical issues; and meet with pertinent authorities.
  - 7) Confer, discuss, and meet with City operating department(s) and Engineering Services staff to produce a cohesive, well-defined proposed scope of design, probable cost estimates(s) and design alternatives.
  - 8) Provide a letter stating that the A/E and Sub-consultant Engineers have checked and reviewed the design memorandum prior to submission.
  - 9) Provide an analysis on project impacts towards “re-engineering” and effects on cost savings toward City operations, which this project will affect.

City staff will provide one set only of the following information (as applicable):

- a. Record drawings, record information of existing facilities, and utilities (as available from City Engineering files).
- b. The preliminary budget, specifying the funds available for construction;
- c. Aerial photography for the Project area.
- d. Through separate contract, related GIS mapping for existing facilities.
- e. A copy of existing studies and plans. (as available from City Engineering files).
- f. Field location of existing city utilities. (A/E to coordinate with City Operating Department).
- g. Provide applicable Master Plans.

2. Design Phase. Upon approval of the preliminary phase, designated by receiving authorization to proceed, the A/E will:
- a. Study, verify, and implement (\_\_\_\_\_) **design memorandum or letter engineering report** recommendations including construction sequencing, connections to the existing facilities, and restoration of property and incorporate these plans into the construction plans. Development of the construction sequencing will be coordinated with the City Operating Department(s) and Engineering Services staff.
  - b. Prepare **one or multiple** (\_\_\_\_\_) sets of Construction Bid and Contract Documents in City format (using City Standards as applicable), including Contract agreement forms, general conditions and supplemental conditions, notice to bidders, instruction to bidders, insurance, bond requirements, and preparation of other contract and bid related items; specifications and drawings to fix and describe, for one bid or for multiple bids, the size and character of the entire Project; description of materials to be utilized; and such other essentials as may be necessary for construction and cost analysis.
  - c. Provide assistance identify testing, handling and disposal of any hazardous materials and/or contaminated soils that may be discovered during construction (to be included under additional services).
  - d. Prepare final quantities and estimates of probable costs **with the recommended construction schedule. The construction schedule will provide a phased approach to better track progress and payments.**
  - e. Furnish one (1) copy of the interim plans (plans only-identify needed specifications) to the City staff for review and approval purposes with estimates of probable construction costs. Identify distribution list for plans and bid documents to all affected utilities including City and all other affected entities. **Required** with the interim plans is a **“Plan Executive Summary”** which will identify and summarize the project by distinguishing key elements such as:
    - Pipe Size or Building Size
    - Pipe Material, etc.
    - Why one material is selected over another
    - Pluses of selections
    - ROW requirements and why
    - Permit requirements and why
    - Easement requirements and why
    - Embedment type and why
    - Constructability, etc.
    - Specific requirements of the City
    - Standard specifications
    - Non-standard specifications
    - Any unique requirements
    - Cost, alternatives, etc.

- Owner permit requirements and status
- f. Assimilate all review comments, modifications, additions/deletions and proceed to next phase, upon Notice to Proceed.
  - g. **(If required)** Provide 1 copy of pre-final plans and bid documents to the City staff for review and approval purposes with revised estimates of probable costs. Compile comments and incorporate any requirements into the plans and specifications, and advise City of responding and non-responding participants.
  - h. Provide Quality Assurance/Quality Control (QA/QC) measures to ensure that submittal of the interim, pre-final (if required), and final complete plans and complete bid documents with specifications accurately reflect the percent completion designated and do not necessitate an excessive amount of revision and correction by City staff. **The Consultant A/E and Sub-consultant A/E shall submit a letter declaring that all engineering disciplines of all phases of the submittals have been checked, reviewed, and are complete prior to submission, and include signature of all disciplines including but not limited to structural, civil, mechanical, electrical, etc.**
  - i. If required, provide traffic controls including a Traffic Control Plan, illumination, markings and striping, signalization, and as delineated by the City Traffic Engineering Department.
  - j. Upon approval by the Director of Engineering Services, provide one (1) set (hard copy and electronic) of final plans and contract documents suitable for reproduction (In City Format) and said bid documents henceforth become the sole property and ownership of the City of Corpus Christi.
  - k. The City agrees that any modifications of the submitted final plans (for other uses by the City) will be evidenced on the plans and be signed and sealed by a professional engineer prior to re-use of modified plans.
  - l. Prepare and submit monthly status reports with action items developed from monthly progress and review meetings.
  - m. Provide a Storm Water Pollution Prevention Plan.
  - n. Ordinance No. 19663 establishes the Municipal Public Arts Program requiring works of art to be included in certain city vertical construction projects. If it is determined this project is subject to Municipal Public Art Program, the architect/engineer will cooperate during the design process to fulfill the requirements of the ordinance.

The City staff will:

- a. Designate an individual to have responsibility, authority, and control for coordinating activities for the construction contract awarded.
- b. Provide the budget for the Project specifying the funds available for the construction contract.
- c. Provide the City's standard specifications, standard detail sheets, standard and special provisions, and forms for required bid documents.

3. Bid Phase. The A/E will:

- a. Participate in the pre-bid conference and provide a recommended agenda for critical construction activities and elements impacted the project.
- b. Assist the City in solicitation of bids by identification of prospective bidders, and review of bids by solicited interests.
- c. Review all pre-bid questions and submissions concerning the bid documents and prepare, in the City's format, for the Engineering Services' approval, any addenda or other revisions necessary to inform contractors of approved changes prior to bidding.
- d. Attend bid opening, analyze bids, evaluate, prepare bid tabulation, and make recommendation concerning award of the contract.
- e. In the event the lowest responsible bidder's bid exceeds the project budget as revised by the Engineering Services in accordance with the A/E's design phase estimate required above, the Engineer will, at its expense, confer with City staff and make such revisions to the bid documents as the City staff deems necessary to re-advertise that particular portion of the Project for bids.

The City staff will:

- a. Arrange and pay for printing of all documents and addenda to be distributed to prospective bidders.
  - b. Advertise the Project for bidding, maintain the list of prospective bidders, receive and process deposits for all bid documents, issue (with the assistance of the A/E) any addenda, prepare and supply bid tabulation forms, and conduct bid opening.
  - c. Receive the Engineer's recommendation concerning bid evaluation and recommendation and prepare agenda materials for the City Council concerning bid awards.
  - d. Prepare, review and provide copies of the contract for execution between the City and the contractor.
4. Construction Phase. The A/E will perform contract administration to include the following:
- a. Participate in pre-construction meeting conference and provide a recommended agenda for critical construction activities and elements impacted the project.
  - b. Review for conformance to contract documents, shop and working drawings, materials and other submittals.
  - c. Review field and laboratory tests.
  - d. Provide interpretations and clarifications of the contract documents for the contractor and authorize required changes, which do not affect the



contractor's price and are not contrary to the general interest of the City under the contract.

- e. Make regular visits to the site of the Project to confer with the City project inspector and contractor to observe the general progress and quality of work, and to determine, in general, if the work is being done in accordance with the contract documents. This will not be confused with the project representative observation or continuous monitoring of the progress of construction.
- f. Prepare change orders as authorized by the City (coordinate with the City's construction division); provide interpretations and clarifications of the plans and specifications for the contractor and authorize minor changes which do not affect the contractor's price and are not contrary to the general interest of the City under the contract.
- g. Make final inspection with City staff and provide the City with a Certificate of Completion for the project.
- h. As applicable, review and assure compliance with plans and specifications, the preparation of operating and maintenance manuals (by the Contractor) for all equipment installed on this Project. These manuals will be in a "multimedia format" suitable for viewing with Microsoft's Internet Explorer, version 3.0. As a minimum the Introduction, Table of Contents, and Index will be in HTML (HyperText Markup Language) format, with HyperText links to the other parts of the manual. The remainder of the manual can be scanned images or a mixture of scanned images and text. use the common formats for scanned images - GIF, TIFF, JPEG, etc.. Confirm before delivery of the manuals that all scanned image formats are compatible with the image-viewing software available on the City's computer - Imaging for Win95 (Wang) and Microsoft Imaging Composer. Deliver the manuals on a CD-ROM, not on floppy disks.
- i. Review construction "red-line" drawings, prepare record drawings of the Project as constructed (from the "red-line" drawings, inspection, and the contractor provided plans) and deliver to the Engineering Services a reproducible set and electronic file (AutoCAD r.14 or later) of the record drawings. All drawings will be CADD drawn using dwg format in AutoCAD, and graphics data will be in dxf format with each layer being provided in a separate file. Attribute data will be provided in ASCII format in tabular form. All electronic data will be compatible with the City GIS system.

The City staff will:

- a. Prepare applications/estimates for payments to contractor.
- b. Conduct the final acceptance inspection with the Engineer.

## **B. Additional Services (ALLOWANCE)**

This section defines the scope (and ALLOWANCE) for compensation for additional services that may be included as part of this contract, but the A/E will not begin work on this section without specific written approval by the Director of Engineering Services. Fees for Additional Services are an allowance for potential services to be provided and will be **negotiated** by the Director of Engineering Services as required. The A/E will, with written authorization by the Director of Engineering Services, do the following:

1. **Permitting.** Furnish the City all engineering data and documentation necessary for all required permits. The A/E will prepare this documentation for all required signatures. The A/E will prepare and submit all permits **as applicable** to the appropriate local, state, and federal authorities, including, but not limited to:
  - a. Union Pacific Railroad, Missouri Pacific Railroad, or any other railroad operating in the area
  - b. TxDOT Permits/Amendments
  - c. Wetlands Delineation and Permit
  - d. Temporary Discharge Permit
  - e. NPDES Permit/Amendments
  - f. Texas Commission of Environmental Quality (TCEQ) Permits/Amendments
  - g. Nueces County
  - h. Texas Historical Commission (THC)
  - i. U.S. Fish and Wildlife Service (USFWS)
  - j. U.S. Army Corps of Engineers (USACE)
  - k. United States Environmental Protection Agency (USEPA)
  - l. Texas Department of License and Regulation (TDLR )
2. **Right-of-Way (ROW) Acquisition Survey.** The A/E will review existing ROW and easements to ascertain any conflicts and provide field ROW surveys and submit ROW plats and descriptions for the City's use in the acquisition process. All work must comply with Category 1-A, Condition I specifications of the Texas Society of Professional Surveyors' Manual of Practice for Land Surveying in the State of Texas, Ninth Edition. All work must be tied to and conform with the City's Global Positioning System (GPS) control network and comply with all TxDOT requirements as applicable. A/E Consultant will be required to perform all necessary deed research.
3. **Topographic Survey.** Provide field surveys, as required for design including the necessary control points, coordinates and elevations of points (as required for the aerial mapping of the Project area - aerial photography to be provided by City). Establish base survey controls for line and elevation staking (not detailed setting of lines and grades for specific structures or facilities). All work must be tied to and conform with the City's Global Positioning System (GPS) control network and comply with Category 6, Condition I specifications of the Texas

Society of Professional Surveyors' Manual of Practice for Land Surveying in the State of Texas, Ninth Edition. Include reference to a minimum of two (2) found boundary monuments from the project area.

4. **Environmental Issues**

- a. Provide environmental site evaluations and Archeology Reports that are needed for the Project.
- b. Identify and develop a scope of work for any testing, handling and disposal of hazardous materials and/or contaminated soils that may be discovered during construction.

5. **Construction Observation Services.**

1. Provide a project representative (PR) to provide periodic construction inspection.
  - A. Through such additional observations of Contractor's work in progress and field checks of materials and equipment by the PR and assistants, the A/E shall endeavor to provide further protection for the CITY against defects and deficiencies in the Work.
  - B. The duties and responsibilities of the PR are described as follows:
    1. General: PR will act as directed by and under the supervision of A/E, and will confer with A/E regarding PR's actions. PR's dealings in matters pertaining to the Contractor's work in progress shall in general be with A/E and Contractor, keeping the CITY advised as necessary.
    2. Conference and Meetings: Attend meetings with Contractor, such as pre-construction conferences, progress meetings, job conferences and other project-related meetings as required by the City, and prepare and circulate copies of minutes thereof.
    3. Liaison:
      - A. Serve as liaison with Contractor, working principally through Contractor's superintendent and assist in understanding the intent of the Contract Documents.
      - B. PR shall communicate with CITY with the knowledge of and under the direction of A/E
    4. Interpretation of Contract Documents: Report when clarifications and interpretations of the Contract Documents are needed and transmit to Contractor clarifications and interpretations as issued.
    5. Shop Drawings and Samples:
      - A. Receive Samples, which are furnished at the Site by Contractor, and notify of availability of Samples for examination.
      - B. Record date of receipt of Samples and approved Shop Drawings.
      - C. Advise Contractor of the commencement of any portion of the Work requiring a Shop Drawing or Sample submittal for which PR believes that the submittal has not been approved.
    6. Review of Work and Rejection of Defective Work:

- A. Conduct on-Site observations of Contractor's work in progress to assist A/E in determining if the Work is in general proceeding in accordance with the Contract Documents.
  - B. Report whenever PR believes that any part of Contractor's work in progress will not produce a completed Project that conforms to the Contract Documents or will prejudice the integrity of the design concept of the completed Project, or has been damaged, or does not meet the requirements of any inspection, test or approval required to be made; and advise City and A/E of that part of work in progress that PR believes should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection or approval.
  - C. Observe whether Contractor has arranged for inspections required by Laws and Regulations, including but not limited to those to be performed by public agencies having jurisdiction over the Work.
7. Records:
- A. Maintain orderly files for correspondence, reports of job conferences, reproductions of original Contract Documents including all Change Orders, Field Orders, Work Change Directives, Addenda, additional Drawings issued subsequent to the Contract, A/E's clarifications and interpretations of the Contract Documents, progress reports, Shop Drawing and Sample submittals received from and delivered to Contractor, and other Project related documents.
  - B. Prepare a daily report utilizing approved City format, recording Contractor's hours on the Site, weather conditions, data relative to questions of Change Orders, Field Orders, Work Change Directives, or changed conditions, Site visitors, daily activities, decisions, observations in general, and specific observations in more detail as in the case of observing test procedures; and send copies to A/E and the City.
8. Reports:
- A. Furnish periodic reports as required of progress of the Work and of Contractor's compliance with the progress schedule and schedule of Shop Drawing and Sample submittals.
  - B. Report immediately to the CITY and A/E the occurrence of any Site accidents, any Hazardous Environmental Conditions, emergencies, or acts of God endangering the Work, and property damaged by fire or other causes.
  - C. Provide project photo report on CD-ROM at the rate of a minimum of two photographs per day, including an adequate amount of photograph documentation of utility conflicts.

9. Completion:
  - A. Before the issue of Certificate of Completion, submit to Contractor a list of observed items requiring completion or correction.
  - B. Participate in a final inspection in the company of A/E, the CITY, and Contractor and prepare a final list of items to be completed or corrected.
  - C. Observe whether all items on final list have been completed or corrected and make recommendations concerning acceptance and issuance of the Notice of Acceptability of the Work.
  
6. **Start-up Services.** Provide on-site services and verification for all start-up procedures during actual start up of major Project components, systems, and related appurtenances if needed and required.
  
7. **Warranty Phase.** Provide a maintenance guaranty inspection toward the end of the one-year period after acceptance of the Project. Note defects requiring contractor action to maintain, repair, fix, restore, patch, or replace improvement under the maintenance guaranty terms of the contract. Document the condition and prepare a report for the City staff of the locations and conditions requiring action, with its recommendation for the method or action to best correct defective conditions and submit to City Staff. Complete the inspection and prepare the report no later than sixty (60) days prior to the end of the maintenance guaranty period.
  
8. **Provide SCADA Documentation.** Provide standardized SCADA documentation, which will include PFDs, P&IDs, loop sheets, logics, SCADA architecture, DCS I/O lists, instrument lists, tie-in lists, piping lists, equipment lists, and instrumentation specification sheets.
  
9. Provide the services above authorized in addition to those items shown on **Exhibit "A-1" Task List.**

2. SCHEDULE

**PROPOSED PROJECT SCHEDULE**

DAY	DATE	ACTIVITY
Wednesday		Begin Preliminary Phase
Monday		Begin Design Phase
Friday		Interim Submittal
Friday		City Review
Friday		Pre-Final Submittal
Friday		City Review
Friday		Final Submittal
Monday (2)		Advertise for Bids
Tue/Wed/Thu		Pre-Bid Conference
Wednesday		Receive Bids
Monday		Begin Construction
Weekday		Construction Completion

3. FEES

**A. Fee for Basic Services.** The City will pay the A/E a fixed fee for providing for all “Basic Services” authorized as per the table below. The fees for Basic Services will not exceed those identified and will be full and total compensation for all services outlined in Section I.A.1-4 above, and for all expenses incurred in performing these services. For services provided in Section I.A.1-4, A/E will submit monthly statements for basic services rendered. In Section I.A.1-3, the statement will be based upon A/E’s estimate (and City Concurrence) of the proportion of the total services actually completed at the time of billing. For services provided in Section I.A.4, the statement will be based upon the percent of completion of the construction contract. City will make prompt monthly payments in response to A/E’s monthly statements.

**B. Fee for Additional Services.** For services authorized by the Director of Engineering Services under Section I.B. “Additional Services” the City will pay the A/E a not-to-exceed fee as per the table below:

**C. Summary of Fees**

<b>Fee for Basic Services</b>	
1. Preliminary Phase	\$0
2. Design Phase	0
3. Bid Phase	0
4. Construction Phase	0
<b>Subtotal Basic Services Fees</b>	<b>0</b>
<b>Fee for Additional Services (Allowance)</b>	
1. Permit Preparation (as applicable) Railroads TXDOT Wetlands Delineation and Permit Temporary Discharge Permit NPDES Permit/Amendments TNRCC Nueces County Texas Historical Commission U.S. Fish and Wildlife Service U.S. Army Corps of Engineers U.S. Environmental Protection Agency Texas Department of License and Regulation	
<b>Total Permitting</b>	<b>0</b>
2. ROW Acquisition Survey ( <b>AUTHORIZED</b> )	0
3. Topographic Survey ( <b>AUTHORIZED</b> )	0
4. Environmental Issues	0
5. Construction Observation Services	0
6. Start-up Services	0
7. Warranty Phase	0
8. Provide SCADA Documentation	0
<b>Sub-Total Additional Services Fees Authorized</b>	<b>0</b>
<b>Total Authorized Fee</b>	<b>\$0</b>

# **SAMPLE**

## **EXHIBIT A-1**

(Provides supplemental description to Exhibit A. Task List does not supersede Exhibit A.)

### **CITY OF CORPUS CHRISTI HOPKINS ROAD DRAINAGE IMPROVEMENT AND WOOLDRIDGE TIMBER BRIDGE REPLACEMENT**

#### **TASK LIST**

- 1) Perform field investigation as required to define specific areas of demolition and new work, equipment, locations, tie-in point, and other applicable parameters required to complete the items as shown on this Task List.
- 2) Attend and participate in project start and planning meetings (2 meetings) with City staff to discuss planning and conceptual design. Gather information and perform close coordination with Storm Water Department staff.
- 3) Develop a preliminary construction schedule and sequencing plan that includes all the items as shown on this Task List. This schedule will include procurement, construction, testing, coordination, and provision for minimum interruption of services and construction schedules with planned Capital Improvement Program (CIP) funding and will also take into consideration recommendations in the appropriate City Storm Water Plans.
- 4) Prepare seven (7) copies of a preliminary phase report including data collected and conceptual cost estimates for the anticipated equipment, civil/site work, electrical, and related construction costs for all the items as shown on this Task List and make recommendation to the City staff.
- 5) Review with City staff, revise, and furnish seven (7) copies of final report. Obtain approval to proceed to Stage 2.

The Engineer shall perform the above Services by considering the essential project parameters including the following:

#### **Hopkins Road Drainage Improvement**

- Perform detailed review of the available reports for this area and conduct field reconnaissance.
- Recommend necessary survey work to evaluate existing conditions. The recommendation will include the location of public and private utilities, structures, right-of-way (ROW) boundaries and critical elevations for adjacent structures and obtain easement information.



- Establish existing topography, inlet and flowline elevations and utility locations.
- Perform visual inspection to determine silt or debris accumulation, line sizes and line defects.
- Establish drainage area boundaries based on a review of existing maps and drawings, previous drainage studies, and field surveys.
- Perform hydraulic analysis based on runoff coefficients, intensity and area. Review current runoff coefficients relative to previous drainage master plans. Review the entire drainage system rather than only one component.
- Use WINSTORM software to perform hydraulic analyses of existing systems and future systems for the design discharge. Identify deficiencies of the system including culvert sizing and culvert and channel obstruction. Use HEC-2 or HEC-RAS software to establish flood plain elevations, bridge capacities, water surface elevations and velocities and provide complete model, data, and all related modeling information to City staff.
- Review alternatives including adding capacity by parallel culverts; inlets; or removal of obstructions.
- Evaluate alternatives to the current channel conditions to reduce flooding potential.
- Prepare cost estimates and benefits of the various alternatives considered. These estimates will also include the required bridge structures.
- Prepare a critical elevation line along the existing channel alignment to determine target maximum water surface elevations for the alternatives analysis.
- Identify environmentally sensitive areas. Identify wetlands based on field surveys and review of soil surveys and National Wetland Inventory maps, and recommend requirements for appropriate action plans and permits to meet state and federal requirements.
- Develop drainage area map for the existing and proposed drainage areas affecting the area.
- Participate in a preliminary public meeting to coordinate with the community and to obtain community support and historical flooding information.
- Coordinate with the railroad on drainage and crossing issues. Any required railroad crossing will need to meet the AREA-E80 loading.
- Identify any applicable Federal Emergency Management Administration (FEMA)

issues associated with the channel.

- Prepare a preliminary engineering report that documents the analyses, approach, cost analysis, benefit analysis and document the work with text, tables, exhibits, computer models and applicable supporting documents.
- Recommend one alternative based on the findings of the preliminary design.
- Recommend any additional required surveying to be performed in Stage 2.
- All designs of structures to be as per required regulations. Identify any special requirements.
- Consider downstream impacts of proposed improvements.
- Define, discuss, and recommend any water quality improvement issues.

### **Wooldridge Timber Bridge Replacement**

- Identify any plans to enlarge any of the ditches upstream of the bridge structure to be designed.
- Review all existing material associated with TxDOT Bridge Inspection report and the drainage ditches for the project and develop recommendations to be further studied.
- Perform an on-site visual inspection of the area to determine current erosion and other existing conditions.
- Establish existing topography, inlet and flowline elevations and utility locations.
- Perform preliminary design concepts for the new bridge structure design alternates including type of bridge, performance, cost, etc. and consider design elements for future bridge widening.
- Perform drainage calculations of ditch and contributing area to determine peak storm water flow rate associated with the design storm event for each drainage area. A 25 year-frequency, 24 hour storm will be utilized unless directed differently by city staff.
- Align future piers/abutments with the channel flow to reduce hydraulic impacts.
- Identify any applicable FEMA issues associated with the area.
- Advise of downstream impacts of proposed improvements.

- A preliminary sketch of the site will be prepared for clarification and will be used for cost estimating.
- A preliminary construction cost estimate will be made for each alternative solution.
- A detailed economic analysis of each alternative design will be performed for the selected life span period. Analysis will include initial capital investment, estimated service life and estimated annual maintenance cost. Net present value of cost of project for 50 years (or other selected period) will be determined.
- Advantages and disadvantages of each alternative will be discussed.
- One alternative design will be recommended based on the finding of the preliminary design. The report will be submitted to the Director of Engineering Services for approval.
- Identify applicable permit requirements.
- Define, discuss, and recommend any water quality improvement issues.
- Recommend any additional surveying to be performed in Stage 2.

## EXHIBIT B

### PROJECT NAME

#### Standards, Codes and Safety Requirements

The Consultant's work will be performed in accordance with the most current applicable standards, codes and safety requirements. Specifically, the Consultant will adhere to all safety requirements for confined space entry inspecting manholes and similar confined spaces and all traffic control regulations.

#### Insurance Requirements

The Consultant will not begin work under the contract until it has obtained all required insurance and provided the City with the related certificates and endorsements. For the duration of the project, the Consultant will provide the insurance listed below and document required coverages with certificates of insurance:

1. Commercial liability including the following coverages:
  - a. Broad form property damage;
  - b. Premises-operations;
  - c. Explosion, collapse, and underground hazard;
  - d. Product/completed operations hazard; and
  - e. Independent contractors.

A letter accompanying the certificate of insurance and signed by an authorized representative of the insurer will state that the commercial liability insurance includes the 5 coverages. Minimum coverage amounts will be:

Bodily Injury and Consequent Death	\$ 500,000 Per Person
Bodily Injury and Consequent Death	\$1,000,000 Per Occurrence
Property Damage	\$1,000,000 Per Occurrence

2. Automobile liability coverage for all owned, non-owned, or rented vehicles. Minimum coverage amounts will be:

Bodily Injury and Consequent Death	\$ 500,000 Per Person
Bodily Injury and Consequent Death	\$1,000,000 Per Occurrence
Property Damage	\$ 500,000 Per Occurrence

3. Employer's liability insurance with a minimum coverage limit of \$100,000 per person.
4. Excess liability insurance coverage (for commercial, automobile, and employer's liability insurance with a minimum coverage limit of \$1,000,000.
5. Workers Compensation Insurance

The Consultant will provide workers compensation insurance for all its employees who will perform any project work. This coverage will be provided through a company authorized to do business in Texas or through self-insurance obtained in accordance with Texas law.

Coverage will be documented in a certificate of insurance or, if the Consultant provides self-insurance, then it will provide to the City a copy of its certificate of authority to self-insure its workers compensation coverage liability. The Consultant will also provide a letter stating that the certificate of authority remains in effect and is not the subject of any revocation proceeding pending before the Texas Workers Compensation Commission.

Except for workers compensation insurance, for each insurance coverage required under the contract, the Consultant will obtain an endorsement to the applicable insurance policy, signed by an authorized representative of the insurer, stating that in the event of cancellation or material change that reduces or restricts the insurance afforded, the insurer agrees to mail 30-days prior written notice of cancellation or material change to the City at:

City of Corpus Christi  
Department of Engineering Services  
Contract Administrator  
P. O. Box 9277  
Corpus Christi, TX 78469-9277

For workers compensation insurance, 10-days notice of cancellation or material change will be sufficient.

The Consultant will also provide an additional insured endorsement for each insurance policy except workers compensation insurance. Each will name the City as additional insured.

### **Use of Subcontractors**

The Consultant may use subcontractors to complete work under this contract. No subcontractor may provide services unless the City consents. Consent will not be withheld unreasonably.

The Consultant will be responsible for completing all contract work even if a subcontractor has assumed responsibility to complete certain work. Also, the Consultant will be responsible for the acts and omissions of any subcontractors.

Furthermore, the Consultant agrees that any subcontractor for this project will include the same mandatory insurance requirements in favor of the City as are specified in the City's contract with the Consultant. This is particularly emphasized for workers compensation insurance coverage. Subcontractor certificates of insurance and endorsements will be collected by the Consultant and available for City review upon request.



**CITY OF CORPUS CHRISTI  
DISCLOSURE OF INTERESTS**

City of Corpus Christi Ordinance 17112, as amended, requires all persons or firms seeking to do business with the City to provide the following information. Every question must be answered. If the question is not applicable, answer with "NA"

**FIRM NAME:** \_\_\_\_\_

**STREET:** \_\_\_\_\_ **CITY:** \_\_\_\_\_ **ZIP:** \_\_\_\_\_

**FIRM is:** 1. Corporation \_\_\_\_\_ 2. Partnership \_\_\_\_\_ 3. Sole Owner \_\_\_\_\_ 4. Association \_\_\_\_\_  
5. Other \_\_\_\_\_

**DISCLOSURE QUESTIONS**

If additional space is necessary, please use the reverse side of this page or attach separate sheet.

1. **State the names of each "employee" of the City of Corpus Christi having an "ownership interest" constituting 3% or more of the ownership in the above named "firm".**

Name	Job Title and City Department (if known)
_____	_____
_____	_____

2. **State the names of each "official" of the City of Corpus Christi having an "ownership interest" constituting 3% or more of the ownership in the above named "firm".**

Name	Title
_____	_____
_____	_____

3. **State the names of each "board member" of the City of Corpus Christi having an "ownership interest" constituting 3% or more of the ownership in the above named "firm".**

Name	Board, Commission or Committee
_____	_____
_____	_____

4. **State the names of each employee or officer of a "consultant" for the City of Corpus Christi who worked on any matter related to the subject of this contract and has an "ownership interest" constituting 3% or more of the ownership in the above named "firm".**

Name	Consultant
_____	_____
_____	_____

**CERTIFICATE**

I certify that all information provided is true and correct as of the date of this statement, that I have not knowingly withheld disclosure of any information requested; and that supplemental statements will be promptly submitted to the City of Corpus Christi, Texas as changes occur.

Certifying Person: \_\_\_\_\_ Title: \_\_\_\_\_  
(Type or Print)

Signature of Certifying Person: \_\_\_\_\_ Date: \_\_\_\_\_

## **DEFINITIONS**

- a. "Board Member". A member of any board, commission or committee appointed by the City Council of the City of Corpus Christi, Texas.
- b. "Employee". Any person employed by the City of Corpus Christi, Texas, either on a full or part time basis, but not as an independent contractor.
- c. "Firm". Any entity operated for economic gain, whether professional, industrial or commercial and whether established to produce or deal with a product or service, including but not limited to, entities operated in the form of sole proprietorship, as self-employed person, partnership, corporation, joint stock company, joint venture, receivership or trust and entities which, for purposes of taxation, are treated as non-profit organizations.
- d. "Official". The Mayor, members of the City Council, City Manager, Deputy City Manager, Assistant City Managers, Department and Division Heads and Municipal Court Judges of the City of Corpus Christi, Texas.
- e. "Ownership Interest". Legal or equitable interest, whether actually or constructively held, in a firm, including when such interest is held through an agent, trust, estate or holding entity. "Constructively held" refers to holding or control established through voting trusts, proxies or special terms of venture or partnership agreements.
- f. "Consultant". Any person or firm, such as engineers and architects, hired by the City of Corpus Christi for the purpose of professional consultation and recommendation.



**COMPLETE PROJECT NAME**

**Project No. XXXX**

**Invoice No. 12345**

**Invoice Date:**

	<b>Contract</b>	<b>Amd No. 1</b>	<b>Amd No. 2</b>	<b>Total Contract</b>	<b>Amount Invoiced</b>	<b>Previous Invoice</b>	<b>Total Invoice</b>	<b>Percent Complete</b>
<b>Basic Services:</b>								
Preliminary Phase	\$1,000	\$0	\$0	\$1,000	\$0	\$1,000	\$1,000	100%
Design Phase	2,000	1,000	0	3,000	1,000	500	1,500	50%
Bid Phase	500	0	250	750	0	0	0	0%
Construction Phase	2,500	0	1,000	3,500	0	0	0	0%
Subtotal Basic Services	\$6,000	\$1,000	\$1,250	\$8,250	\$750	\$1,500	\$2,500	30%
<b>Additional Services:</b>								
Permitting	\$2,000	\$0	\$0	\$2,000	\$500	\$0	\$500	25%
Warranty Phase	0	1,120	0	1,120	0	0	0	0%
Inspection	0	0	1,627	1,627	0	0	0	0%
Platting Survey	TBD	TBD	TBD	TBD	TBD	TBD	TBD	0%
O & M Manuals	TBD	TBD	TBD	TBD	TBD	TBD	TBD	0%
SCADA	TBD	TBD	TBD	TBD	TBD	TBD	TBD	0%
Subtotal Additional Services	\$2,000	\$1,120	\$1,627	\$4,747	\$500	\$0	\$500	11%
<b>Summary of Fees</b>								
Basic Services Fees	\$6,000	\$1,000	\$1,250	\$8,250	\$750	\$1,500	\$2,500	30%
Additional Services Fees	2,000	1,120	1,627	4,747	500	0	500	11%
<b>Total of Fees</b>	<b>\$8,000</b>	<b>\$2,120</b>	<b>\$2,877</b>	<b>\$12,997</b>	<b>\$1,250</b>	<b>\$1,500</b>	<b>\$3,000</b>	<b>23%</b>

**CONTRACT FOR ENGINEERING (LARGE A/E) SERVICES**

**EXHIBIT "D"**

Page 1 OF 1

Last Revision: Dec 2004

SAMPLE FOR PROJECT  
 MANHOUR BREAKDOWN FOR SERVICES BY A/E CONSULTANT

SHEET DESCRIPTION	Sr. PM		QC		Sr. Eng		Proj. Engr.		Designer		Technical		Administrative		Task	Total
	Hours	Total	Hours	Total	Hours	Total	Hours	Total	Hours	Total	Hours	Total	Hours	Total		
<b>I GENERAL</b>																
1 Cover Sheet/Location/Sheet Index																
2 General Abbreviations																
3 Legends and Symbols																
4 Process Flow Diagram/Hydraulic Profile																
Subtotal																
<b>II CIVIL</b>																
5 Site Piping - Demolition																
6 Existing Grit Basic Demolition																
7 Construction Sequence																
8 Temporary Basin Line																
9 Site Paving and Grading																
10 Site Piping Plan and Profiles																
11 Site Piping Profiles																
12 Miscellaneous Piping Charges																
13 Details																
Subtotal																
<b>III ARCHITECTURAL</b>																
14 Elevations and Schedules																
15 Electrical Building Elevations																
16 Floor Plan and Roof Plan																
17 Building Sections																
18 Schedules																
19 Miscellaneous Details																
20 Standard Details																
Subtotal																
<b>IV STRUCTURAL</b>																
21 Screen building Modifications																
22 Foundation Plan																
23 Sectional Plan																
24 Roof Deck Plan																
25 Building Sections																
26 Building Sections																
27 Wall Sections																
28 Pumps																
29 Grit Dewatering Plan and Sections																
30 Details, Isometrics and Schedules																
31 Structure - Plan, Sections and Details																
32 Schedule and Details																
33 Details																
34 Details																
Subtotal																

SAMPLE FOR PROJECT  
MANHOUR BREAKDOWN FOR SERVICES BY A/E CONSULTANT

SHEET DESCRIPTION	Sr. PM		QC		Sr. Eng		Proj. Engr.		Designer		Technical		Administrative		Task	Total
	Hours	Total	Hours	Total	Hours	Total	Hours	Total	Hours	Total	Hours	Total	Hours	Total		
<b>V MECHANICAL</b>																
35 Plumbing Plan																
36 HVAC/Odor Control Plans																
37 Electrical Building Plan																
38 Plumbing Isometric																
39 Details																
Subtotal																
<b>VI ELECTRICAL</b>																
40 Abbreviations																
41 Symbols																
42 Site Plan																
43 On Line Diagrams and Schedules																
44 Power and Lighting Plan																
45 Power and Lighting Plan																
46 Local Control Panels and MCC Elevation																
47 Control Diagrams																
48 Lighting Fixture Schedule																
49 Details																
Subtotal																
<b>VII INSTRUMENTATION AND CONTROL</b>																
50 Legend and Symbols																
51 P & ID																
52 P & ID																
53 P & ID																
54 P & ID																
55 P & ID																
56 Elevations and Schedules																
57 P & ID																
Subtotal																
<b>SUBTOTAL:</b>																

SUBTOTALS	Principal		Project Manager		Project Engineer		Engineer		CAD		Surveying		Clerical		Task	Total
	Hours	Total	Hours	Total	Hours	Total	Hours	Total	Hours	Total	Hours	Total	Hours	Total		
Contract Documents and Specifications																
<b>SUBTOTAL:</b>																

<b>PROJECT TOTALS:</b>																
------------------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

**CONTRACT**  
**(FRONT-END)**  
**DOCUMENTS**

# (1) CONTRACT DOCUMENTS ON DISK AND HARD COPY

Special Provisions  
General Provisions  
Supplemental Special Provisions  
Notice  
Notice To Bidders  
Agreement  
Proposal  
Performance Bond  
Payment Bond  
Title Page  
O. N. Stevens On-Site Permit  
P.1 - P.2 - P.3 - P.4 - P.5 - P.6

# (2) CONTRACT DOCUMENTS EDIT COMMENTS (Marked-Up Set)

Revised September 18, 2000

**July 10, 2000**  
CONTRACT DOCUMENTS INFORMATION

Documents included:

SPECIAL PROVISIONS  
SUPPLEMENTAL SPECIAL PROVISIONS  
NOTICE  
NOTICE TO BIDDERS  
AGREEMENT  
PROPOSAL  
PERFORMANCE BOND  
PAYMENT BOND  
GENERAL PROVISIONS  
BID PROPOSAL SHEETS: P.1 THRU P.6  
O.N. STEVENS ON-SITE VISITOR PERMIT  
TITLE PAGE

1. Under Wordperfect 6.1.
2. Most documents have been created as "primary merge" documents (those with extension .PM); just enter the information called for in each of the *input* commands.
3. Keep the **same size** font throughout the Special Provisions.
4. In the SPECIAL PROVISIONS, If a particular section does not apply to the specific project, leave section number, title, and text in place, but type in "**NOT USED**".  
~~Strike-out text.~~ (see sample attached)

Samples are also included for Item A-4, Method of Award.

5. NOTICE TO CONTRACTORS B - Only page 1 of the 6 pages is on disk; however, all the 6 pages are included. Pages 2 thru 6 would need to be xeroxed and attached.
6. NOTICE TO BIDDERS: Keep, if at all possible, on one page. (adjust top/bottom margins if necessary).
7. Where reference is made to **cdbg paragraph**: if yes, insert following paragraph and continue; if not, by-pass and continue.

This project is funded in part through the Community Development Act of 1974, \_\_\_ year program. Approximately \$\_\_\_\_\_, or \_\_\_\_\_% of the total estimated project cost, will be funded through this source.

Actual wondering if a CDBG project will come from the City Project Engineer who will identify year program(s) and \$\$\$\$\$\$/%%%%% of project cost. NOTICE TO BIDDERS MUST HAVE CDBG PARAGRAPH INCLUDED IF A CDBG PROJECT!!

Keep in mind that based on the particular project, modifications will need to be made when preparing each document, i.e., page breaks, page numbering, etc.

When completing SPECIAL PROVISIONS, review and make sure we **do not** have a title without text at end of page. If so, adjust to move title to next page with appropriate text.

Should you have any questions, please call me, Rosa Ramirez, at 880-3506.





S P E C I A L P R O V I S I O N S  
S P E C I F I C A T I O N S  
A N D  
F O R M S O F C O N T R A C T S A N D B O N D S  
F O R

KEYBOARD(Project Name (caps/bold))

KEYBOARD(if A/E Consultant, type in name/address/etc.,  
(centered), if not, by-pass)

FOR

DEPARTMENT OF ENGINEERING SERVICES  
CITY OF CORPUS CHRISTI, TEXAS  
Phone: 361/880-3500  
Fax: 361/880-3501

PROJECT NO: KEYBOARD(City  
Project #)

DRAWING NO: KEYBOARD(24x36  
Plan Drawing(s) No.)

(Revised 7/5/00)

KEYBOARD(Name of Project (ALL CAPS))

Table of Contents

NOTICE TO BIDDERS (Revised 7/5/00)

NOTICE TO CONTRACTORS - A (Revised Sept. 2000)  
Insurance Requirements

NOTICE TO CONTRACTORS - B (Revised 7/5/00)

Worker's Compensation Coverage For Building or Construction  
Projects For Government Entities

**PART A - SPECIAL PROVISIONS**

- A-1 Time and Place of Receiving Proposals/Pre-Bid Meeting
- A-2 Definitions and Abbreviations
- A-3 Description of Project
- A-4 Method of Award
- A-5 Items to be Submitted with Proposal
- A-6 Time of Completion/Liquidated Damages
- A-7 Workers Compensation Insurance Coverage
- A-8 Faxed Proposals
- A-9 Acknowledgment of Addenda
- A-10 Wage Rates (Revised 7/5/00)
- A-11 Cooperation with Public Agencies (Revised 7/5/00)
- A-12 Maintenance of Services
- A-13 Area Access and Traffic Control
- A-14 Construction Equipment Spillage and Tracking
- A-15 Excavation and Removals
- A-16 Disposal/Salvage of Materials
- A-17 Field Office
- A-18 Schedule and Sequence of Construction
- A-19 Construction Staking
- A-20 Testing and Certification
- A-21 Project Signs
- A-22 Minority/Minority Business Enterprise Participation Policy (Revised 10/98)
- A-23 Inspection Required (Revised 7/5/00)
- A-24 Surety Bonds
- ~~A-25 Sales Tax Exemption NO LONGER APPLICABLE (6/11/98)~~
- A-26 Supplemental Insurance Requirements
- A-27 Responsibility for Damage Claims
- A-28 Considerations for Contract Award and Execution
- A-29 Contractor's Field Administration Staff
- A-30 Amended "Consideration of Contract" Requirements
- A-31 Amended Policy on Extra Work and Change Orders
- A-32 Amended "Execution of Contract" Requirements
- A-33 Conditions of Work
- A-34 Precedence of Contract Documents
- A-35 City Water Facilities Special Requirements
- A-36 Other Submittals (Revised 9/18/00)

- A-37 Amended "Arrangement and Charge for Water Furnished by the City"
- A-38 Worker's Compensation Coverage for Building or Construction Projects for Government Entities
- A-39 Certificate of Occupancy and Final Acceptance
- A-40 Amendment to Section B-8-6: Partial Estimates
- A-41 Ozone Advisory
- A-42 OSHA Rules & Regulations
- A-43 Amended Indemnification & Hold Harmless (9/98)
- A-44 Change Orders (4/26/99)
- A-45 As-Built Dimensions and Drawings (7/5/00)
- A-46 Disposal of Highly Chlorinated Water (7/5/00)
- A-47 Pre-Construction Exploratory Excavations (7/5/00)
- A-48 Overhead Electrical Wires (7/5/00)
- A-49 Amend "Maintenance Guaranty" (8/24/00)

- SUPPLEMENTAL SPECIAL PROVISIONS

PART B - GENERAL PROVISIONS

PART C - FEDERAL WAGE RATES AND REQUIREMENTS

PART S - STANDARD SPECIFICATIONS

LIST OF DRAWINGS

NOTICE

AGREEMENT

PROPOSAL/DISCLOSURE STATEMENT

PERFORMANCE BOND

PAYMENT BOND

NOTICE TO BIDDERS

Sealed proposals, addressed to the City of Corpus Christi, Texas for:

KEYBOARD(project name (all caps)) consists of KEYBOARD(project description) in accordance with the plans, specifications and contract documents;

will be received at the office of the City Secretary until 2:00 p.m. on Wednesday, KEYBOARD(BID DATE), and then publicly opened and read. Any bid received after closing time will be returned unopened.

A KEYBOARD(Mandatory? if yes, say MANDATORY, if not by-pass)pre-bid meeting is scheduled for KEYBOARD(day of week/date/time/location). The pre-bid meeting will be conducted by the City, and will include KEYBOARD(what? a tour? ) KEYBOARD(If NO pre-bid mtg., only include next sentence---REMEMBER TO DELETE ALL TEXT PRECEDING)There will be NO pre-bid meeting for this project.

KEYBOARD(cdbg proj? If yes, leave paragraph, if not, delete.)This project is funded in part through the Community Development Act of KEYBOARD(City Proj Engineer will provide), year program. Approximately \$KEYBOARD(City Proj Engineer will provide), or KEYBOARD(City Proj Engineer will provide)% of the total estimated project cost will be funded through this source. A bid bond in the amount of 5% of the highest amount bid must accompany each proposal. Failure to provide the bid bond will constitute a non-responsive proposal which will not be considered. Failure to provide required performance and payment bonds for contracts over \$25,000.00 will result in forfeiture of the 5% bid bond to the City as liquidated damages. Bidder's plan deposit is subject to mandatory forfeiture to the City if bidding documents are not returned to the City within two weeks of receipt of bids.

Plans, proposal forms, specifications and contract documents may be procured from the City Engineer upon a deposit of Fifty and no/100 Dollars (\$50.00) as a guarantee of their return in good condition within two weeks of bid date. Documents can be obtained by mail upon receipt of an additional (\$10.00) which is a non-refundable postage/handling charge.

The bidder is hereby notified that the owner has ascertained the wage rates which prevail in the locality in which this work is to be done and that such wage scale is set out in the contract documents obtainable at the office of the City Engineer and the Contractor shall pay not less than the wage rates so shown for each craft or type of "laborer," "workman," or "mechanic" employed on this project.

The City reserves the right to reject any or all bids, to waive irregularities and to accept the bid which, in the City's opinion, seems most advantageous to the City and in the best interest of the public.

CITY OF CORPUS CHRISTI, TEXAS

/s/'Angel R. Escobar, P.E.  
Director of Engrg. Services

/s/ Armando Chapa  
City Secretary

# NOTICE TO CONTRACTORS - A INSURANCE REQUIREMENTS

Revised September, 2000

A Certificate of Insurance indicating proof of coverage in the following amounts is required:

TYPE OF INSURANCE	MINIMUM INSURANCE COVERAGE
30-Day Notice of Cancellation required on all certificates	Bodily Injury and Property Damage
Commercial General Liability including: 1. Commercial Form 2. Premises - Operations 3. Explosion and Collapse Hazard 4. Underground Hazard 5. Products/ Completed Operations Hazard 6. Contractual Insurance 7. Broad Form Property Damage 8. Independent Contractors 9. Personal Injury	\$2,000,000 COMBINED SINGLE LIMIT
AUTOMOBILE LIABILITY--OWNED NON-OWNED OR RENTED	\$1,000,000 COMBINED SINGLE LIMIT
WORKERS' COMPENSATION	WHICH COMPLIES WITH THE TEXAS WORKERS' COMPENSATION ACT AND PARAGRAPH II OF THIS EXHIBIT
EMPLOYERS' LIABILITY	\$100,000
EXCESS LIABILITY	\$1,000,000 COMBINED SINGLE LIMIT
PROFESSIONAL POLLUTION LIABILITY/ ENVIRONMENTAL IMPAIRMENT COVERAGE Not limited to sudden & accidental discharge; to include long-term environmental impact for the disposal of contaminants	\$2,000,000 COMBINED SINGLE LIMIT <input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED
BUILDERS' RISK	See Section B-6-11 and Supplemental Insurance Requirements <input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED
INSTALLATION FLOATER	See Section B-6-11 and Supplemental Insurance Requirements <input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED

€The **City of Corpus Christi** must be named as an **additional insured** on all coverages except worker's compensation liability coverage.

€The **name of the project** must be listed under "description of operations" on each certificate of insurance.

€For each insurance coverage, the Contractor shall obtain an endorsement to the applicable insurance policy, signed by the insurer, providing the City with thirty (30) days prior written notice of cancellation of or material change on any coverage. The Contractor shall provide to the City the other endorsements to insurance policies or coverages which are specified in section B-6-11 or Special Provisions section of the contract.

A completed "**Disclosure of Interest**" must be submitted with your proposal.

*Should you have any questions regarding insurance requirements, please contact the Contract Administrator at 880-3500.*

## NOTICE TO CONTRACTORS - B

### WORKER'S COMPENSATION COVERAGE FOR BUILDING OR CONSTRUCTION PROJECTS FOR GOVERNMENT ENTITIES

Texas law requires that most contractors, subcontractors, and others providing work or services for a City building or construction project must be covered by worker's compensation insurance, authorized self-insurance, or an approved worker's compensation coverage agreement.

Even if Texas law does not require a contractor, subcontractor or others performing project services (including deliveries to the job site) to provide 1 of the 3 forms of worker's compensation coverage, the City will require such coverage for all individuals providing work or services on this Project at any time, including during the maintenance guaranty period. Motor carriers which are required to register with the Texas Department of Transportation under Texas Civil Statutes Article 6675c, and which provide accidental insurance coverage under Texas Civil Statutes Article 6675c, Section 4(j) need not provide 1 of the 3 forms of worker's compensation coverage.

The Contractor agrees to comply with all applicable provisions of Texas Administrative Code Title 28, Section 110.110, a copy of which is attached and deemed incorporated into the project contract. Please note that under section 110.110:

1. certain language must be included in the Contractor's Contract with the City and the Contractor's contracts with subcontractors and others providing services for the Project;
2. the Contractor is required to submit to the City certificates of coverage for its employees and for all subcontractors and others providing services on the Project. The Contractor is required to obtain and submit updated certificates showing extension of coverage during the Project; and
3. the Contractor is required to post the required notice at the job site.

By signing this Contract, the Contractor certifies that it will timely comply with these Notice to Contractors "B" requirements.

## Title 28. INSURANCE

### Part II. TEXAS WORKERS' COMPENSATION COMMISSION

#### Chapter 110. REQUIRED NOTICES OF COVERAGE

##### Subchapter B. EMPLOYER NOTICES

###### § 110.110 Reporting Requirements for Building or Construction Projects for Governmental Entities

---

(a) The following words and terms, when used in this rule, shall have the following meanings, unless the context clearly indicates otherwise. Terms not defined in this rule shall have the meaning defined in the Texas Labor Code, if so defined.

(1) Certificate of coverage (certificate)—A copy of a certificate of insurance, a certificate of authority to self-insure issued by the commission, or a workers' compensation coverage agreement (TWCC-81, TWCC-82, TWCC-83, or TWCC-84), showing statutory workers' compensation insurance coverage for the person's or entity's employees (including those subject to a coverage agreement) providing services on a project, for the duration of the project.

(2) Building or construction—Has the meaning defined in the Texas Labor Code, § 406.096(e)(1).

(3) Contractor—A person bidding for or awarded a building or construction project by a governmental entity.

(4) Coverage—Workers' compensation insurance meeting the statutory requirements of the Texas Labor Code, § 401.011(44).

(5) Coverage agreement—A written agreement on form TWCC-81, form TWCC-82, form TWCC-83, or form TWCC-84, filed with the Texas Workers' Compensation Commission which establishes a relationship between the parties for purposes of the Texas Workers' Compensation Act, pursuant to the Texas Labor Code, Chapter 406, Subchapters F and G, as one of employer/employee and establishes who will be responsible for providing workers' compensation coverage for persons providing services on the project.

(6) Duration of the project—Includes the time from the beginning of work on the project until the work on the project has been completed and accepted by the governmental entity.

(7) Persons providing services on the project ("subcontractor" in § 406.096 of the Act)—With the exception of persons excluded under subsections (h) and (i) of this section, includes all persons or entities performing all or part of the services the contractor has undertaken to perform on the project, regardless of whether that person contracted directly with the contractor and regardless of whether that person has employees. This includes but is not limited to independent contractors, subcontractors, leasing companies, motor carriers, owner-operators, employees of any such entity, or employees of any entity furnishing persons to perform services on the project. "Services" includes but is not limited



to providing, hauling, or delivering equipment or materials, or providing labor, transportation, or other service related to a project. "Services" does not include activities unrelated to the project, such as food/beverage vendors, office supply deliveries, and delivery of portable toilets.

(8) Project—Includes the provision of all services related to a building or construction contract for a governmental entity.

(b) Providing or causing to be provided a certificate of coverage pursuant to this rule is a representation by the insured that all employees of the insured who are providing services on the project are covered by workers' compensation coverage, that the coverage is based on proper reporting of classification codes and payroll amounts, and that all coverage agreements have been filed with the appropriate insurance carrier or, in the case of a self-insured, with the commission's Division of Self-Insurance Regulation. Providing false or misleading certificates of coverage, or failing to provide or maintain required coverage, or failing to report any change that materially affects the provision of coverage may subject the contractor or other person providing services on the project to administrative penalties, criminal penalties, civil penalties, or other civil actions.

(c) A governmental entity that enters into a building or construction contract on a project shall:

(1) include in the bid specifications, all the provisions of paragraph (7) of this subsection, using the language required by paragraph (7) of this subsection;

(2) as part of the contract, using the language required by paragraph (7) of this subsection, require the contractor to perform as required in subsection (d) of this section;

(3) obtain from the contractor a certificate of coverage for each person providing services on the project, prior to that person beginning work on the project;

(4) obtain from the contractor a new certificate of coverage showing extension of coverage:

(A) before the end of the current coverage period, if the contractor's current certificate of coverage shows that the coverage period ends during the duration of the project; and

(B) no later than seven days after the expiration of the coverage for each other person providing services on the project whose current certificate shows that the coverage period ends during the duration of the project;

(5) retain certificates of coverage on file for the duration of the project and for three years thereafter;

(6) provide a copy of the certificates of coverage to the commission upon request and to any person entitled to them by law; and

(7) use the language contained in the following Figure 1 for bid specifications and contracts, without any additional words or changes, except those required to accommodate the specific document in which they are contained or to impose stricter standards of documentation:

T28S110.110(c)(7)

tbl

2) A contractor shall:

(1) provide coverage for its employees providing services on a project, for the duration of the project based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements;

(2) provide a certificate of coverage showing workers' compensation coverage to the governmental entity prior to beginning work on the project;

(3) provide the governmental entity, prior to the end of the coverage period, a new certificate of coverage showing extension of coverage, if the coverage period shown on the contractor's current certificate of coverage ends during the duration of the project;

(4) obtain from each person providing services on a project, and provide to the governmental entity:

(A) a certificate of coverage, prior to that person beginning work on the project, so the governmental entity will have on file certificates of coverage showing coverage for all persons providing services on the project; and

(B) no later than seven days after receipt by the contractor, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

(5) retain all required certificates of coverage on file for the duration of the project and for one year thereafter;

(6) notify the governmental entity in writing by certified mail or personal delivery, within ten days after the contractor knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project;

(7) post a notice on each project site informing all persons providing services on the project that they are required to be covered, and stating how a person may verify current coverage and report failure to provide coverage. This notice does not satisfy other posting requirements imposed by the Act or other commission rules. This notice must be printed with a title in at least 30 point bold type and text in at least 19 point normal type, and shall be in both English and Spanish and any other language common to the worker population. The text for the notices shall be the following text provided by the commission on the sample notice, without any additional words or changes:

#### REQUIRED WORKERS' COMPENSATION COVERAGE

"The law requires that each person working on this site or providing services related to this construction project must be covered by workers' compensation insurance. This includes persons providing, hauling, or delivering equipment or materials, or providing labor or transportation or other service related to the project, regardless of the identity of their employer or status as an employee."

"Call the Texas Workers' Compensation Commission at 512-440-3789 to receive information on the legal requirement for coverage, to verify whether your employer has provided the required coverage, or to report an employer's failure to provide coverage."

(8) contractually require each person with whom it contracts to provide services on a project to:

(A) provide coverage based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements for all of its employees providing services on the project, for the duration of the project;

(B) provide a certificate of coverage to the contractor prior to that person beginning work on the project;

(C) include in all contracts to provide services on the project the language in subsection (e)(3) of this section;

(D) provide the contractor, prior to the end of the coverage period, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

(E) obtain from each other person with whom it contracts, and provide to the contractor:

(i) a certificate of coverage, prior to the other person beginning work on the project; and

(ii) prior to the end of the coverage period, a new certificate of coverage showing extension of the coverage period, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

(F) retain all required certificates of coverage on file for the duration of the project and for one year thereafter;

(G) notify the governmental entity in writing by certified mail or personal delivery, within ten days after the person knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project; and

(H) contractually require each other person with whom it contracts, to perform as required by subparagraphs (A)-(H) of this paragraph, with the certificate of coverage to be provided to the person for whom they are providing services.

(e) A person providing services on a project, other than a contractor, shall:

(1) provide coverage for its employees providing services on a project, for the duration of the project based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements;

(2) provide a certificate of coverage as required by its contract to provide services on the project, prior to beginning work on the project;

(3) have the following language in its contract to provide services on the project: "By signing this contract or providing or causing to be provided a certificate of coverage, the person signing this contract is representing to the governmental entity that all employees of the person signing this contract who will provide services on the project will be covered by workers' compensation coverage

for the duration of the project, that the coverage will be based on proper reporting of classification codes and payroll amounts, and that all coverage agreements will be filed with the appropriate insurance carrier or, in the case of a self-insured, with the commission's Division of Self-Insurance Regulation. Providing false or misleading information may subject the contractor to administrative penalties, criminal penalties, civil penalties, or other civil actions."

(4) provide the person for whom it is providing services on the project, prior to the end of the coverage period shown on its current certificate of coverage, a new certificate showing extension of coverage, if the coverage period shown on the certificate of coverage ends during the duration of the project;

(5) obtain from each person providing services on a project under contract to it, and provide as required by its contract:

(A) a certificate of coverage, prior to the other person beginning work on the project; and

(B) prior to the end of the coverage period, a new certificate of coverage showing extension of the coverage period, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

(6) retain all required certificates of coverage on file for the duration of the project and for one year thereafter;

(7) notify the governmental entity in writing by certified mail or personal delivery, of any change that materially affects the provision of coverage of any person providing services on the project and send the notice within ten days after the person knew or should have known of the change; and

(8) contractually require each other person with whom it contracts to:

(A) provide coverage based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements for all of its employees providing services on the project, for the duration of the project;

(B) provide a certificate of coverage to it prior to that other person beginning work on the project;

(C) include in all contracts to provide services on the project the language in paragraph (3) of this subsection;

(D) provide, prior to the end of the coverage period, a new certificate of coverage showing extension of the coverage period, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

(E) obtain from each other person under contract to it to provide services on the project, and provide as required by its contract:

(i) a certificate of coverage, prior to the other person beginning work on the project; and

(ii) prior to the end of the coverage period, a new certificate of coverage showing extension of the coverage period, if the coverage period shown on the current certificate of coverage ends during the

duration of the contract:

(F) retain all required certificates of coverage on file for the duration of the project and for one year thereafter;

(G) notify the governmental entity in writing by certified mail or personal delivery, within ten days after the person knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project; and

(H) contractually require each person with whom it contracts, to perform as required by this subparagraph and subparagraphs (A)-(G) of this paragraph, with the certificate of coverage to be provided to the person for whom they are providing services.

(f) If any provision of this rule or its application to any person or circumstance is held invalid, the invalidity does not affect other provisions or applications of this rule that can be given effect without the invalid provision or application, and to this end the provisions of this rule are declared to be severable.

(g) This rule is applicable for building or construction contracts advertised for bid by a governmental entity on or after September 1, 1994. This rule is also applicable for those building or construction contracts entered into on or after September 1, 1994, which are not required by law to be advertised for bid.

(h) The coverage requirement in this rule does not apply to motor carriers who are required pursuant to Texas Civil Statutes, Article 6675c, to register with the Texas Department of Transportation and who provide accidental insurance coverage pursuant to Texas Civil Statutes, Article 6675c, § 4(j).

(i) The coverage requirement in this rule does not apply to sole proprietors, partners, and corporate officers who meet the requirements of the Act, § 406.097(c), and who are explicitly excluded from coverage in accordance with the Act, § 406.097(a) (as added by House Bill 1089, 74th Legislature, 1995, § 1.20). This subsection applies only to sole proprietors, partners, and corporate executive officers who are excluded from coverage in an insurance policy or certificate of authority to self-insure that is delivered, issued for delivery, or renewed on or after January 1, 1996.

**Source:** The provisions of this § 110.110 adopted to be effective September 1, 1994, 19 TexReg 5715; amended to be effective November 6, 1995, 20 TexReg 8609.

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[Return to Section Index](#)

KEYBOARD(Name of Project (ALL CAPS))

SECTION A - SPECIAL PROVISIONS

A-1 Time and Place of Receiving Proposals/Pre-Bid Meeting

Sealed proposals will be received in conformity with the official advertisement inviting bids for the project. Proposals will be received in the office of the City Secretary, located on the first floor of City Hall, 1201 Leopard Street, until **2:00 p.m., Wednesday, KEYBOARD(Date of Bid)**. Proposals mailed should be addressed in the following manner:

City of Corpus Christi  
City Secretary's Office  
1201 Leopard Street  
Corpus Christi, Texas 78401  
ATTN: BID PROPOSAL - (IDENTIFY PROJECT NAME)

A pre-bid meeting will be held on KEYBOARD(Day of Week & Date of Meeting), beginning at KEYBOARD(Time of Mtg.am? pm?). The pre-bid meeting will convene at KEYBOARD(Location of Mtg.), and will include KEYBOARD(What Will Mtg. Cover)

No additional or separate visitations will be conducted by the City.

A-2 Definitions and Abbreviations

Section B-1 of the General Provisions will govern.

A-3 Description of Project

This project consists of KEYBOARD(Project Description).

KEYBOARD(assessment project? if yes, leave paragraph, if not, delete)This is an assessment project. The City will carry all notes and liens and conduct the necessary legal proceedings. The Contractor should anticipate a possible delay of two (2) to three (3) months following receipt of bids to allow the City time to complete the assessment hearing process. The contract will be awarded after the required hearing on assessments is held by the City. The public hearing will be held within two (2) months after receipt of bids. The City may cancel the award, or any part thereof, if the proceedings of the public hearing are not successful. If the award is canceled, such cancellation shall not constitute the basis for a claim by the Contractor for damages or anticipated profit.

A-4 Method of Award

The bids will be evaluated based on the **Total Base Bid, or KEYBOARD(A List of Additive Alternates in Order of Priority)**.

The City reserves the right to reject any or all bids, to waive irregularities and to accept the bid which, in the City's opinion, is most advantageous to the City and in the best interest of the public.

A-5 Items to be Submitted with Proposal

The following items are required to be submitted with the proposal:

1. 5% Bid Bond (Must reference Project Name as identified in the Proposal)

(A Cashier's Check, certified check, money order or bank draft from any State or National Bank will also be acceptable.)

2. Disclosure of Interests Statement

A-6 Time of Completion/Liquidated Damages

The working time for completion of the Project will be KEYBOARD(Time of Completion WD? CD?). The Contractor shall commence work within ten (10) calendar days after receipt of written notice from the Director of Engineering Services or designee ("City Engineer") to proceed.

For each calendar day that any work remains incomplete after the time specified in the Contract for completion of the work or after such time period as extended pursuant to other provisions of this Contract, KEYBOARD(Liquidated Damages Amt.) per calendar day will be assessed against the Contractor as liquidated damages. Said liquidated damages are not imposed as a penalty but as an estimate of the damages that the City will sustain from delay in completion of the work, which damages by their nature are not capable of precise proof. The Director of Engineering Services (City Engineer) may withhold and deduct from monies otherwise due the Contractor the amount of liquidated damages due the City.

A-7 Workers Compensation Insurance Coverage

If the Contractor's workers' compensation insurance coverage for its employees working on the Project is terminated or cancelled for any reason, and replacement workers' compensation insurance coverage meeting the requirements of this Contract is not in effect on the effective date of cancellation of the workers' compensation insurance coverage to be replaced, then any Contractor employee not covered by the required workers' compensation insurance coverage must not perform any work on the Project.

Furthermore, for each calendar day including and after the effective date of termination or cancellation of the Contractor's workers' compensation insurance coverage for its employees working on the Project until the date replacement workers' compensation insurance coverage, meeting the requirements of this Contract, is in effect for those Contractor employees, liquidated damages will be assessed against and paid by the Contractor at the highest daily rate elsewhere specified in this Contract. Such liquidated damages will accumulate without notice from the City Engineer to the Contractor and will be assessed and paid even if the permitted time to complete the Project has not expired.

In accordance with other requirements of this Contract, the Contractor shall not permit subcontractors or others to work on the Project unless all such individuals working on the Project are covered by workers' compensation insurance and unless the required documentation of such coverage has been provided to the Contractor and the City Engineer.

A-8 Faxed Proposals

Proposals faxed directly to the City will be considered non-responsive. Proposals must contain original signatures and guaranty and be submitted in accordance with Section B-2 of the General Provisions.

**A-9 Acknowledgment of Addenda**

The Contractor shall acknowledge receipt of all addenda received in the appropriate space provided in the proposal. Failure to do so will be interpreted as non-receipt. Since addenda can have significant impact on the proposal, failure to acknowledge receipt, and a subsequent interpretation of non-receipt, could have an adverse effect when determining the lowest responsible bidder.

**A-10 Wage Rates** (Revised 7/5/00)

Labor preference and wage rates for **KEYBOARD (Bldg. or Heavy Construction)**. KEYBOARD (For multiple wage rates, need statement that the higher rate will govern. If multiple wage rates, include the following statement; if not, delete)) In case of conflict, Contractor shall use higher wage rate.

**Minimum Prevailing Wage Scales**

The Corpus Christi City Council has determined the general prevailing minimum hourly wage rates for Nueces County, Texas as set out in **Part C**. The Contractor and any subcontractor must not pay less than the specified wage rates to all laborers, workmen, and mechanics employed by them in the execution of the Contract. The Contractor or subcontractor shall forfeit sixty dollars (\$60.00) per calendar day, or portion thereof, for each laborer, workman, or mechanic employed, if such person is paid less than the specified rates for the classification of work performed. The Contractor and each subcontractor must keep an accurate record showing the names and classifications of all laborers, workmen, and mechanics employed by them in connection with the Project and showing the actual wages paid to each worker.

The Contractor will make bi-weekly certified payroll submittals to the City Engineer. The Contractor will also obtain copies of such certified payrolls from all subcontractors and others working on the Project. These documents will also be submitted to the City Engineer bi-weekly. (See section for Minority/Minority Business Enterprise Participation Policy for additional requirements concerning the proper form and content of the payroll submittals.)

One and one-half (12) times the specified hourly wage must be paid for all hours worked in excess of 40 hours in any one week and for all hours worked on Sundays or holidays. (See Section B-1-1, Definition of Terms, and Section B-7-6, Working Hours.)

**A-11 Cooperation with Public Agencies** (Revised 7/5/00)

The Contractor shall cooperate with all public and private agencies with facilities operating within the limits of the Project. The Contractor shall provide a forty-eight (48) hour notice to any applicable agency when work is anticipated to proceed in the vicinity of any facility by using the Texas One-Call System 1-800-245-4545, the Lone Star Notification Company at 1-800-669-8344, and the Southwestern Bell Locate Group at 1-800-828-5127. For the Contractor's convenience, the following telephone numbers are listed.

City Engineer	880-3500
Project Engineer	880-3500
A/E Project Engineer	KEYBOARD (enter full name)
	KEYBOARD (enter address, City/State/Zip)
	KEYBOARD (enter ph/fax #s)
Traffic Engineer	880-3540
Police Department	882-1911



Water Division	857-1880	(880-3140 after hours)
Wastewater Services Division	857-1818	(880-3140 after hours)
Gas Division	885-6900	(885-6900 after hours)
Storm Water	857-1881	(880-3140 after hours)
Parks & Recreation	880-3461	
Solid Waste Services	857-1970	
Central Power & Light Co.	299-4833	(693-9444 after hours)
Southwestern Bell Telephone Co.	881-2511	(1-800-824-4424, after hours)
City Street Div. for Traffic		
Signal/Fiber Optic Locate	857-1946	857-1960
Cablevision	857-5000	(857-5060 after hours)
ACSI (Fiber Optic)	887-9200	(Pager 800-724-3624)
KMC (Fiber Optic)	813-1124	(Pager 888-204-1679)
ChoiceCom (Fiber Optic)	881-5767	(Pager 850-2981)
CAPROCK (Fiber Optic)	512/935-0958	(Mobile)
Brooks Fiber Optic (MAN)	972-753-4355	

#### A-12 Maintenance of Services

The Contractor shall take all precautions in protecting existing utilities, both above and below ground. The Drawings show as much information as can be reasonably obtained from existing as-built drawings, base maps, utility records, etc. and from as much field work as normally deemed necessary for the construction of this type of project with regard to the location and nature of underground utilities, etc. However, the accuracy and completeness of such information is not guaranteed. It is the Contractor's sole and complete responsibility to locate such underground features sufficiently in advance of his operations to preclude damaging the existing facilities. If the Contractor encounters utility services along the line of this work, it is his responsibility to maintain the services in continuous operation at his own expense.

In the event of damage to underground utilities, whether shown in the drawings, the Contractor shall make the necessary repairs to place the utilities back in service to construct the work as intended at no increase in the Contract price. All such repairs must conform to the requirements of the company or agency that owns the utilities.

Where existing sewers are encountered and are interfered with (i.e. broken, cut, etc.), flow must be maintained. Sewage or other liquid must be handled by the Contractor either by connection into other sewers or by temporary pumping to a satisfactory outlet, all with the approval of the City Engineer. Sewage or other liquid must not be pumped, bailed or flumed over the streets or ground surface and Contractor must pay for all fines and remediation that may result if sewage or other liquid contacts the streets or ground surface. It is also the Contractor's responsibility to make all necessary repairs, relocations and adjustments to the satisfaction of the City Engineer at no increase in the Contract price. Materials for repairs, adjustments or relocations of sewer service lines must be provided by the Contractor.

#### A-13 Area Access and Traffic Control

Sufficient traffic control measures must be used to assure a safe condition and to provide a minimum of inconvenience to motorists. All weather access must be provided to all residents and businesses at all times during construction. The Contractor must provide temporary driveways and/or roads of approved material during wet weather. The Contractor must maintain a stockpile on the Project site to meet the demands of inclement weather.

The Contractor will be required to schedule his operations so as to cause minimum

adverse impact on the accessibility of adjoining properties. This may include, but is not limited to, working driveways in half widths, construction of temporary ramps, etc.

The Contractor shall comply with the City of Corpus Christi's Uniform Barricading Standards and Practices as adopted by the City. Copies of this document are available through the City's Traffic Engineering Department. The Contractor shall secure the necessary permit from the City's Traffic Engineering Department.

All costs for traffic control are considered subsidiary; therefore, no direct payment will be made to Contractor.

#### **A-14 Construction Equipment Spillage and Tracking**

The Contractor shall keep the adjoining streets free of tracked and/or spilled materials going to or from the construction area. Hand labor and/or mechanical equipment must be used where necessary to keep these roadways clear of job-related materials. Such work must be completed without any increase in the Contract price.

Streets and curb line must be cleaned at the end of the work day or more frequently, if necessary, to prevent material from washing into the storm sewer system. No visible material that could be washed into storm sewer is allowed to remain on the Project site or adjoining streets.

#### **A-15 Excavation and Removals**

The excavated areas behind curbs and adjacent to sidewalks and driveways must be filled with "clean" dirt. "Clean" dirt is defined as dirt that is capable of providing a good growth of grass when applied with seed/sod and fertilizer. The dirt must be free of debris, caliche, asphalt, concrete and any other material that detracts from its appearance or hampers the growth of grass.

All existing concrete and asphalt within the limits of the Project must be removed unless otherwise noted.

All necessary removals including but not limited to pipe, driveways, sidewalks, etc., are to be considered subsidiary to the bid item for "Street Excavation"; therefore, no direct payment will be made to Contractor.

#### **A-16 Disposal/Salvage of Materials**

Excess excavated material, broken asphalt, concrete, broken culverts and other unwanted material becomes the property of the Contractor and must be removed from the site by the Contractor. The cost of all hauling is considered subsidiary; therefore, no direct payment will be made to Contractor.

#### **A-17 Field Office**

The Contractor must furnish the City Engineer or his representative with a field office at the construction site. The field office must contain at least 120 square feet of useable space. The field office must be air-conditioned and heated and must be furnished with an inclined table that measures at least 30" x 60" and two (2) chairs. The Contractor shall move the field office on the site as required by the City Engineer or his representative. The field office must be furnished with a telephone (with 24-hour per day answering service) and FAX machine paid for by the Contractor. There is no separate pay item for the field office.

#### **A-18 Schedule and Sequence of Construction**

The Contractor shall submit to the City Engineer a work plan based only on working days. This plan must detail the schedule of work and must be submitted to the City Engineer at least three (3) working days prior to the pre-construction meeting.

The plan must indicate the schedule of the following work items:

1. Initial Schedule: Submit to the City Engineer three (3) days prior to the Pre-Construction Meeting an initial Construction Progress Schedule for review.
2. Items to Include: Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Identify the first work day of each week.
3. Submittal Dates: Indicate submittal dates required for all submittals.
4. Re-Submission: Revise and resubmit as required by the City Engineer.
5. Periodic Update: Submit Updated Construction Progress Schedule to show actual progress of each stage by percentage against initial Schedule.

#### **A-19 Construction Staking**

The drawings depict lines, slopes, grades, sections, measurements, bench marks, baselines, etc. that are normally required to construct a project of this nature.

The major controls and bench marks required for setting up a project, if not shown on the drawings, will be provided by the City Surveyor.

The City Engineer will furnish the Contractor with all lines, slopes and measurements for control of the work.

If, during construction, it is necessary to disturb or destroy a control point or bench mark, the Contractor shall provide the City Surveyor 48 hours notice so that alternate control points can be established by the City Surveyor as he deems necessary, at no cost to the Contractor. Control points or bench marks damaged as a result of the Contractor's negligence will be restored by the City Surveyor at the expense of the Contractor.

If, for whatever reason, it is necessary to deviate from proposed line and grade to properly execute the work, the Contractor shall obtain approval of the City Engineer prior to deviation. If, in the opinion of the City Engineer, the required deviation would necessitate a revision to the drawings, the Contractor shall provide supporting measurements as required for the City Engineer to revise the drawings. The Contractor shall tie in or reference all valves and manholes, both existing and proposed, for the purpose of adjusting valves and manholes at the completion of the paving process. Also, the City Engineer may require that the Contractor furnish a maximum of two (2) personnel for the purpose of assisting the measuring of the completed work.

#### **A-20 Testing and Certification**

All tests required under this item must be done by a recognized testing laboratory selected by the City Engineer. The cost of the laboratory testing will be borne by the City. In the event that any test fails, that test must be done over after corrective measures have been taken, and the cost of retesting will be borne by the Contractor and deducted from the payment to the Contractor.

The Contractor must provide all applicable certifications to the City Engineer.

## A-21 Project Signs

The Contractor must furnish and install KEYBOARD (Number of Signs?) Project signs as indicated on the following drawings. (Attachment III) The signs must be installed before construction begins and will be maintained throughout the Project period by the Contractor. The location of the signs will be determined in the field by the City Engineer.

## A-22 Minority/Minority Business Enterprise Participation Policy (Revised 10/98)

### 1. Policy

It is the policy of the City of Corpus Christi that maximum opportunity is afforded minorities, women and Minority Business Enterprises to participate in the performance of contracts awarded by the City of Corpus Christi in support of Equal Employment Opportunity goals and objectives of the Affirmative Action Policy Statement of the City dated October, 1989, and any amendments thereto. In accordance with such policy, the City has established goals, as stated herein, both for minority and female participation by trade and for Minority Business Enterprise.

### 2. Definitions

- a. Prime Contractor: Any person, firm, partnership, corporation, association or joint venture as herein provided which has been awarded a City contract.
- b. Subcontractor: Any named person, firm, partnership, corporation, association, or joint venture as herein identified as providing work, labor, services, supplies, equipment, materials or any combination of the foregoing under contract with a prime contractor on a City contract.
- c. Minority Business Enterprise: A business enterprise that is owned and controlled by one or more minority person(s). Minority persons include Blacks, Mexican-Americans and other persons of Hispanic origin, American Indians, Alaskan Natives, and Asians or Pacific Islanders. For the purposes of this section, women are also considered as minorities. Minority person(s) must collectively own, operate and/or actively manage, and share in payments from such an enterprise in the manner hereinafter set forth:
  1. Owned
    - (a) For a sole proprietorship to be deemed a minority business enterprise, it must be owned by a minority person.
    - (b) For an enterprise doing business as a partnership, at least 51.0% of the assets or interest in the partnership property must be owned by one or more minority person(s).
    - (c) For an enterprise doing business as a corporation, at least 51.0% of the assets or interest in the corporate shares must be owned by one or more minority person(s).
  2. Controlled

The primary power, direct or indirect, to manage a business enterprise rests with a minority person(s).
  3. Share in Payments

Minority partners, proprietor or stockholders, of the enterprise, as the case may be, must be entitled to receive 51.0% or more of the total profits, bonuses, dividends, interest payments, commissions, consulting fees, rents, procurement, and subcontract payments, and any other monetary distribution paid by the business enterprise.

- d. Minority: See definition under Minority Business Enterprise.
- e. Female Owned Business Enterprise: A sole proprietorship that is owned and controlled by a woman, a partnership at least 51.0% of whose assets or partnership interests are owned by one or more women, or a corporation at least 51.0% of whose assets or interests in the corporate shares are owned by one or more women.
- f. Joint Venture: A joint venture means an association of two or more persons, partnerships, corporations, or any combination thereof, founded to carry on a single business activity which is limited in scope and direction. The degree to which a joint venture may satisfy the stated MBE goal cannot exceed the proportionate interest of the MBE as a member of the joint venture in the work to be performed by the joint venture. For example, a joint venture which is to perform 50.0% of the contract work itself and in which a minority joint venture partner has a 50.0% interest, shall be deemed equivalent to having minority participation in 25.0% of the work. Minority members of the joint venture must have either financial, managerial, or technical skills in the work to be performed by the joint venture.

3. Goals

- a. The goals for participation by minorities and Minority Business Enterprises expressed in percentage terms for the Contractor's aggregate work force on all construction work for the Contract award are as follows:

Minority Participation (Percent)	Minority Business Enterprise Participation (Percent)
<u>KEYBOARD(%) %</u>	<u>KEYBOARD(%) %</u>

- b. These goals are applicable to all the construction work (regardless of federal participation) performed in the Contract, including approved change orders. The hours of minority employment must be substantially uniform throughout the length of the Contract and in each trade. The transfer of minority employees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's percentage is prohibited.

4. Compliance

- a. Upon completion of the Project, a final breakdown of MBE participation, substantiated by copies of paid invoices, shall be submitted by the Contractor to the City Engineer.
- b. The Contractor shall make bi-weekly payroll submittals to the City Engineer. The Contractor is to indicate the percent of minority and female participation, by trade, which has been utilized on the Project. Along with the request for final payment on the Project, the Contractor will indicate, in writing, the overall participation in these areas which

have been achieved. The City Engineer may withhold monthly or final payments to the Contractor for failure to submit bi-weekly payrolls in a timely fashion or to submit overall participation information as required.

**A-23 Inspection Required** (Revised 7/5/00)

The Contractor shall assure the appropriate building inspections by the Building Inspection Division at the various intervals of work for which a permit is required and to assure a final inspection after the building is completed and ready for occupancy. Contractor must obtain the Certificate of Occupancy, when applicable. Section B-6-2 of the General Provisions is hereby amended in that the Contractor must pay all fees and charges levied by the City's Building Inspection Department, and all other City fees, including water/wastewater meter fees and tap fees as required by City.

**A-24 Surety Bonds**

Paragraph two (2) of Section B-3-4 of the General Provisions is changed to read as follows:

"No surety will be accepted by the City from any Surety Company who is now in default or delinquent on any bonds or who has an interest in any litigation against the City. All bonds must be issued by an approved Surety Company authorized to do business in the State of Texas. If performance and payment bonds are in an amount in excess of ten percent (10%) of the Surety Company's capital and surplus, the Surety Company shall provide certification satisfactory to the City Attorney that the Surety Company has reinsured the portion of the bond amount that exceeds ten percent (10%) of the Surety Company's capital and surplus with reinsurer(s) authorized to do business in the State of Texas. The amount of the bond reinsured by any reinsurer may not exceed ten percent (10%) of the reinsurer's capital and surplus. For purposes of this section, the amount of allowed capital and surplus will be verified through the State Board of Insurance as of the date of the last annual statutory financial statement of the Surety Company or reinsurer authorized and admitted to do business in the State of Texas. The Surety shall designate an agent who is a resident of Nueces County, Texas. Each bond must be executed by the Contractor and the Surety. For contracts in excess of \$100,000 the bond must be executed by a Surety company that is certified by the United States Secretary of the Treasury or must obtain reinsurance for any liability in excess of \$100,000 from a reinsurer that is certified by the United States Secretary of the Treasury and that meets all the above requirements. The insurer or reinsurer must be listed in the Federal Register as holding certificates of authority on the date the bond was issued."

**A-25 Sales Tax Exemption** (NOT USED)

~~Section B-6-22, Tax Exemption Provision, is deleted in its entirety and the following substituted in lieu thereof:~~

~~Contracts for improvements to real property awarded by the City of Corpus Christi do not qualify for exemptions of Sales, Excise, and Use Taxes unless the Contractor elects to operate under a separated contract as defined by Section 3.291 of Chapter 3, Tax Administration of Title 34, Public Finance of the Texas Administrative Code, or such other rules or regulations as may be promulgated by the Comptroller of Public Accounts of Texas.~~

~~If the Contractor elects to operate under a separated contract, he shall:~~

- ~~1. Obtain the necessary sales tax permits from the State Comptroller.~~
- ~~2. Identify in the appropriate space on the "Statement of Materials and Other Charges" in the proposal form the cost of materials physically incorporated into the Project.~~
- ~~3. Provide resale certificates to suppliers.~~
- ~~4. Provide the City with copies of material invoices to substantiate the proposal value of materials.~~

~~If the Contractor does not elect to operate under a separated contract, he must pay for all Sales, Excise, and Use Taxes applicable to this Project.~~

~~Subcontractors are eligible for sales tax exemptions if the subcontractor also complies with the above requirements. The Contractor must issue a resale certificate to the subcontractor and the subcontractor, in turn, issues a resale certificate to his supplier.~~

#### A-26 Supplemental Insurance Requirements

For each insurance coverage provided in accordance with Section B-6-11 of the Contract, the Contractor shall obtain an endorsement to the applicable insurance policy, signed by the insurer, stating:

In the event of cancellation or material change that reduces or restricts the insurance afforded by this coverage part, each insurer covenants to mail prior written notice of cancellation or material change to:

1. Name: City of Corpus Christi  
Engineering Services Department  
Attn: Contract Administrator
2. Address: P.O. Box 9277  
Corpus Christi, Texas 78469-9277
3. Number of days advance notice: 30

The Contractor shall provide to the City Engineer the signed endorsements, or copies thereof certified by the insurer, within thirty (30) calendar days after the date the City Engineer requests that the Contractor sign the Contract documents.

Within thirty (30) calendar days after the date the City Engineer requests that the Contractor sign the Contract documents, the Contractor shall provide the City Engineer with a certificate of insurance certifying that the Contractor provides worker's compensation insurance coverage for all employees of the Contractor employed on the Project described in the Contract.

For each insurance coverage provided in accordance with Section B-6-11 of the Contract, the Contractor shall obtain an endorsement to the applicable insurance policy, signed by the insurer, stating that the City is an additional insured under the insurance policy. The City need not be named as additional insured on Worker's Compensation coverage.

For contractual liability insurance coverage obtained in accordance with Section B-6-11 (a) of the Contract, the Contractor shall obtain an endorsement to this coverage stating:

Contractor agrees to indemnify, save harmless and defend the City, its agents, servants, and employees, and each of them against and hold it and them harmless from any and all lawsuits, claims, demands, liabilities, losses and expenses, including court costs and attorneys' fees, for or on account of any injury to any person, or any death at any time resulting from such injury, or any damage to any property, which may arise or which may be alleged to have arisen out of or in connection with the work covered by this Contract. The foregoing indemnity shall apply except if such injury, death or damage is caused directly by the negligence or other fault of the City, its agents, servants, or employees or any person indemnified hereunder.

#### A-27 Responsibility for Damage Claims

Paragraph (a) General Liability of Section B-6-11 of the General Provisions is amended to include:

Contractor must provide builder's risk insurance coverage for the term of the Contract up to and including the date the City finally accepts the Project or work. Builder's risk coverage must be an "All Risk" form. Contractor must pay all costs necessary to procure such builder's risk insurance coverage, including any deductible. The City must be named additional insured on any policies providing such insurance coverage.

#### A-28 Considerations for Contract Award and Execution

To allow the City Engineer to determine that the bidder is able to perform its obligations under the proposed contract, then prior to award, the City Engineer may require a bidder to provide documentation concerning:

1. Whether any liens have been filed against bidder for either failure to pay for services or materials supplied against any of its projects begun within the preceding two (2) years. The bidder shall specify the name and address of the party holding the lien, the amount of the lien, the basis for the lien claim, and the date of the release of the lien. If any such lien has not been released, the bidder shall state why the claim has not been paid; and
2. Whether there are any outstanding unpaid claims against bidder for services or materials supplied which relate to any of its projects begun within the preceding two (2) years. The bidder shall specify the name and address of the claimant, the amount of the claim, the basis for the claim, and an explanation why the claim has not been paid.

A bidder may also be required to supply construction references and a financial statement, prepared no later than ninety (90) days prior to the City Engineer's request, signed and dated by the bidder's owner, president or other authorized party, specifying all current assets and liabilities.

#### A-29 Contractor's Field Administration Staff

The Contractor shall employ for this Project, as its field administration staff, superintendents and foremen who are careful and competent and acceptable to the City Engineer.

The criteria upon which the City Engineer makes this determination may include the following:

1. The superintendent must have at least **five (5) years** experience in the day-to-day field management and oversight of projects of a similar size and complexity



to this Project. This experience must include, but is not limited to, scheduling of manpower and materials, structural steel erection, masonry, safety, coordination of subcontractors, and familiarity with the architectural submittal process, federal and state wage rate requirements, and contract close-out procedures.

2. The foreman must have at least five (5) years experience in oversight and management of the work of various subcontractors and crafts. If the scope of the Project is such that a foreman is not required, the Contractor's superintendent shall assume the responsibilities of a foreman.

Documentation concerning these matters will be reviewed by the City Engineer. The Contractor's field administration staff, and any subsequent substitutions or replacements thereto, must be approved by the City Engineer in writing prior to such superintendent or foreman assuming responsibilities on the Project.

Such written approval of field administration staff is a prerequisite to the City Engineer's obligation to execute a contract for this Project. If such approval is not obtained, the award may be rescinded. Further, such written approval is also necessary prior to a change in field administration staff during the term of this Contract. If the Contractor fails to obtain prior written approval of the City Engineer concerning any substitutions or replacements in its field administration staff for this Project during the term of the Contract, such a failure constitutes a basis to annul the Contract pursuant to section B-7-13.

#### **A-30 Amended "Consideration of Contract" Requirements**

Under "General Provisions and Requirements for Municipal Construction Contracts" Section B-3-1 Consideration of Contract add the following text:

Within five (5) working days following the public opening and reading of the proposals, the three (3) apparent lowest bidders (based on the Base Bid only) must submit to the City Engineer the following information:

1. A list of the major components of the work;
2. A list of the products to be incorporated into the Project;
3. A schedule of values which specifies estimates of the cost for each major component of the work;
4. A schedule of anticipated monthly payments for the Project duration.
5. The names and addresses of MBE firms that will participate in the Contract, along with a description of the work and dollar amount for each firm; and substantiation, either through appropriate certifications by federal agencies or signed affidavits from the MBE firms, that such MBE firms meet the guidelines contained herein. Similar substantiation will be required if the Contractor is an MBE. If the responses do not clearly show that MBE participation will meet the requirements above, the bidder must clearly demonstrate, to the satisfaction of the City Engineer, that a good faith effort has, in fact, been made to meet said requirements but that meeting such requirements is not reasonably possible.
6. A list of subcontractors that will be working on the Project. This list may contain more than one subcontractor for major components of the work if the Contractor has not completed his evaluation of which subcontractor will perform the work.

The City Engineer retains the right to approve all subcontractors that will perform work on the Project. The Contractor shall obtain written approval by the City Engineer of all of its subcontractors prior to beginning work on the Project. If the City Engineer does not approve all proposed subcontractors, it may rescind the Contract award.

In the event that a subcontractor previously listed and approved is sought to be substituted for or replaced during the term of the Contract, then the City Engineer retains the right to approve any substitute or replacement subcontractor prior to its participation in the Project. Such approval will not be given if the replacement of the subcontractor will result in an increase in the Contract price. Failure of the Contractor to comply with this provision constitutes a basis upon which to annul the Contract pursuant to Section B-7-13;

7. A preliminary progress schedule indicating relationships between the major components of the work. The final progress schedule must be submitted to the City Engineer at the pre-construction conference;
8. Documentation required pursuant to the Special Provisions A-28 and A-29 concerning Considerations for Contract Award and Execution and the Contractor's Field Administration Staff.
9. Documentation as required by Special Provision A-35-K, if applicable.
10. Within five (5) days following bid opening, submit in letter form, information identifying type of entity and state, i.e., Texas (or other state) Corporation or Partnership, and name(s) and Title(s) of individual(s) authorized to execute contracts on behalf of said entity.

#### A-31 Amended Policy on Extra Work and Change Orders

Under "General Provisions and Requirements for Municipal Construction Contracts" B-8-5 Policy on Extra Work and Change Orders the present text is deleted and replaced with the following:

Contractor acknowledges that the City has no obligation to pay for any extra work for which a change order has not been signed by the Director of Engineering Services or his designee. The Contractor also acknowledges that the City Engineer may authorize change orders which do not exceed \$25,000.00. The Contractor acknowledges that any change orders in an amount in excess of \$25,000.00 must also be approved by the City Council.

#### A-32 Amended "Execution of Contract" Requirements

Under "General Provisions and Requirements for Municipal Construction Contracts" B-3-5 Execution of Contract add the following:

The award of the Contract may be rescinded at any time prior to the date the City Engineer delivers a contract to the Contractor which bears the signatures of the City Manager, City Secretary, and City Attorney, or their authorized designees. Contractor has no cause of action of any kind, including for breach of contract, against the City, nor is the City obligated to perform under the Contract, until the date the City Engineer delivers the signed Contracts to the Contractor.

#### A-33 Conditions of Work

Each bidder must familiarize himself fully with the conditions relating to the

completion of the Project. Failure to do so will not excuse a bidder of his obligation to carry out the provisions of this Contract. Contractor is reminded to attend the Pre-Bid Meeting referred to in Special Provision A-1.

**A-34 Precedence of Contract Documents**

In case of conflict in the Contract documents, first precedence will be given to addenda issued during the bidding phase of the Project, second precedence will be given to the Special Provisions, third precedence will be given to the construction plans, fourth precedence will be given to the Standard Specifications and the General Provisions will be given last precedence. In the event of a conflict between any of the Standard Specifications with any other referenced specifications, such as the Texas Department of Public Transportation Standard Specifications for Highways, Streets and Bridges, ASTM specifications, etc., the precedence will be given to addenda, Special Provisions and Supplemental Special Provisions (if applicable), construction plans, referenced specifications, Standard Specifications, and General Provisions, in that order.

**A-35 City Water Facilities: Special Requirements**

**A. Visitor/Contractor Orientation**

Prior to performing work at any City water facility, the Contractor, his subcontractors, and each of their employees must have on their person a valid card certifying their prior attendance at a Visitor/Contractor Safety Orientation Program conducted by the City Water Department Personnel. A Visitor/Contractor Safety Orientation Program will be offered by authorized City Water Department personnel for those persons who do not have such a card, and who desire to perform any work within any City water facility. For additional information refer to **Attachment 1.**

**B. Operation of City-Owned Equipment**

The Contractor shall not start, operate, or stop any pump, motor, valve, equipment, switch, breaker, control, or any other item related to City water facility at any time. All such items must be operated by an operator or other authorized maintenance employee of the City Water Department.

**C. Protection of Water Quality**

The City must deliver water of drinking quality to its customers at all times. The Contractor shall protect the quality of the water in the job site and shall coordinate its work with the City Water Department to protect the quality of the water.

**D. Conformity with ANSI/NSF Standard 61**

All materials and equipment used in the repair, reassembly, transportation, reinstallation, and inspection of pumps, or any other items, which could come into contact with potable water, must conform to American National Standards Institute/National Sanitation Foundation (ANSI/NSF) Standard 61 as described in the Standard Specifications.

**Such materials include all solvents, cleaners, lubricants, gaskets, thread compounds, coatings, or hydraulic equipment. These items must not be used unless they conform with**

**ANSI/NSF Standard 61 and unless such items are inspected on the site by authorized City personnel immediately prior to use.**

The Contractor shall provide the Engineer with copies of written proof of ANSI/NSF Standard 61 approval for all materials which could come into contact with potable water.

**E. Handling and Disposal of Trash**

All trash generated by the Contractor or his employees, agents, or subcontractors, must be contained at all times at the water facility site. Blowing trash will not be allowed. The Contractor shall keep work areas clean at all times and remove all trash daily.

**CONTRACTOR'S ON-SITE PREPARATION**

F. Contractor's personnel must wear colored uniform overalls other than orange, blue, or white. Each employee uniform must provide company name and individual employee identification.

G. Contractor shall provide telephones for Contractor personnel. **Plant telephones are not available for Contractor use.**

H. Working hours will be 7:00 A.M. to 5:00 P.M., Monday thru Friday.

I. Contractor must not use any City facility restrooms. Contractor must provide own sanitary facilities.

J. All Contractor vehicles must be parked at designated site, as designated by City Water Department staff. All Contractor vehicles must be clearly labeled with company name. No private employee vehicles are allowed at O. N. Stevens Water Treatment Plant. All personnel must be in company vehicles. During working hours, contractor employees must not leave the designated construction area nor wander through any buildings other than for required work or as directed by City Water Department personnel during emergency evacuation.

**K. Contractor Qualifications - SCADA (SUPERVISORY CONTROL AND DATA ACQUISITION)**

Any work to the computer-based monitoring and control system must be performed only by qualified technical and supervisory personnel, as determined by meeting the qualifications 1 thru 9 below. This work includes, but is not limited to, modifications, additions, changes, selections, furnishing, installing, connecting, programming, customizing, debugging, calibrating, or placing in operation all hardware and/or software specified or required by these specifications.

The Contractor or his subcontractor proposing to perform the SCADA work must be able to demonstrate the following:

1. He is regularly engaged in the computer-based monitoring and control system business, preferably as applied to the municipal water and wastewater industry.
2. He has performed work on systems of comparable size, type, and complexity as required in this Contract on at least three prior projects.

3. He has been actively engaged in the type of work specified herein for at least 5 years.
4. He employs a Registered Professional Engineer, a Control Systems Engineer, or an Electrical Engineer to supervise or perform the work required by this specifications.
5. He employs personnel on this Project who have successfully completed a manufacturer's training course in configuring and implementing the specific computers, RTUS's, and software proposed for the Contract.
6. He maintains a permanent, fully staffed and equipped service facility within 400 miles of the Project site to maintain, repair, calibrate, and program the systems specified herein.
7. He shall furnish equipment which is the product of one manufacturer to the maximum practical extent. Where this is not practical, all equipment of a given type will be the product of one manufacturer.
8. Prior performance at the O. N. Stevens Water Treatment Plant will be used in evaluating which Contractor or subcontractor programs the new work for this Project.
9. The Contractor shall produce all filled-out programming blocks required to show the programming as needed and required, to add these two systems to the existing City SCADA system. Attached is an example of the required programming blocks which the City requires to be filled in and given to the City Engineer with all changes made during the programming phase. The attached sheet is an example and is not intended to show all of the required sheets. The Contractor will provide all programming blocks used.

L. Trenching Requirements

All trenching for this project at the O. N. Stevens Water Treatment Plant shall be performed using a backhoe or hand-digging due to the number of existing underground obstructions. No trenching machines shall be allowed on the project.

A-36 Other Submittals

1. Shop Drawing Submittal: The Contractor shall follow the procedure outlined below when processing Shop Drawing submittals:
  - a. Quantity: Contractor shall submit number required by the City to the City Engineer or his designated representative.
  - b. Reproduces: In addition to the required copies, the Contractor shall also submit one (1) reproducible transparency for all shop drawings.
  - c. Submittal Transmittal Forms: Contractor shall use the Submittal Transmittal Form attached at the end of this Section; and sequentially number each transmittal form. Resubmittals must have the original submittal number with an alphabetic suffix. Contractor must identify the Contractor, the Subcontractor or supplier; pertinent Drawing sheet and detail number(s), and specification Section number, as appropriate, on each submittal form.
  - d. Contractor's Stamp: Contractor must apply Contractor's stamp, appropriately signed or initialed, which certifies that review, verification of Products required, field dimensions, adjacent

construction work, and coordination of information, is all in accordance with the requirements of the Project and Contract documents.

- e. Scheduling: Contractor must schedule the submittals to expedite the Project, and deliver to the City Engineer for approval, and coordinate the submission of related items.
  - f. Marking: Contractor must mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information unique to this Project.
  - g. Variations: Contractor must identify any proposed variations from the Contract documents and any Product or system limitations which may be detrimental to successful performance of the completed work.
  - h. Space Requirements: Contractor must provide adequate space for Contractor and Engineer review stamps on all submittal forms.
  - i. Resubmittals: Contractor must revise and resubmit submittals as required by City Engineer and clearly identify all changes made since previous submittal.
  - j. Distribution: Contractor must distribute copies of reviewed submittals to subcontractors and suppliers and instruct subcontractors and suppliers to promptly report, thru Contractor, any inability to comply with provisions.
2. Samples: The Contractor must submit samples of finishes from the full range of manufacturers' standard colors, textures, and patterns for City Engineer's selection.
3. Test and Repair Report

When specified in the Technical Specifications Section, Contractor must submit three (3) copies of all shop test data, and repair report, and all on-site test data within the specified time to the City Engineer for approval. Otherwise, the related equipment will not be approved for use on the project.

**A-37 Amended "Arrangement and Charge for Water Furnished by the City"**

Under "General Provisions and Requirements for Municipal Construction Contracts", B-6-15 Arrangement and Charge for Water Furnished by the City, add the following:

"The Contractor must comply with the City of Corpus Christi's Water Conservation and Drought Contingency Plan as amended (the "Plan"). This includes implementing water conservation measures established for changing conditions. The City Engineer will provide a copy of the Plan to Contractor at the pre-construction meeting. The Contractor will keep a copy of the Plan on the Project site throughout construction."

**A-38 Worker's Compensation Coverage for Building or Construction Projects for Government Entities**

The requirements of "Notice to Contractors `B'" are incorporated by reference in this Special Provision.

**A-39 Certificate of Occupancy and Final Acceptance**

The issuance of a certificate of occupancy for improvements does not constitute final acceptance of the improvements under General Provision B-8-9.

**A-40 Amendment to Section B-8-6: Partial Estimates**

General Provisions and Requirements for Municipal Construction Contracts Section B-8-6: Partial Estimates is amended to provide that approximate estimates from which partial payments will be calculated will not include the net invoice value of acceptable, non-perishable materials delivered to the Project worksite unless the Contractor provides the City Engineer with documents, satisfactory to the City Engineer, that show that the material supplier has been paid for the materials delivered to the Project worksite.

**A-41 Ozone Advisory**

Priming and hot-mix paving operations must not be conducted on days for which an ozone advisory has been issued, except for repairs. The City Engineer will notify Contractor about ozone alert. If a delay such as this is experienced, the day **will not** be counted as a work day and the Contractor will be compensated at the unit price indicated in the proposal.

**A-42 OSHA Rules & Regulations**

It is the responsibility of the Contractor(s) to adhere to all applicable OSHA rules and regulations while performing any and all City-related projects and or jobs.

**A-43 Amended Indemnification & Hold Harmless**

Under "General Provisions and Requirements for Municipal Construction Contracts" **B-6-21 Indemnification & Hold Harmless**, text is deleted in its entirety and the following is substituted in lieu thereof:

The Contractor shall hold the City, its officials, employees, attorneys, and agents harmless and shall indemnify the City, its officials, employees, attorneys, and agents from any and all damages, injury or liability whatsoever from an act or omission of the contractor, or any subcontractor, supplier, materialman, or their officials, employees, agents, or consultants, or any work done under the contract or in connection therewith by the contractor, or any subcontractor, supplier, materialman, or their officials, employees, agents, or consultants.

The contractor shall hold the City, its officials, employees, attorneys, and agents harmless and shall indemnify the City, its officials, employees, attorneys, and agents from any and all damages, injury, or liability whatsoever from a negligent act or omission of the city, its officials, employees, attorneys, and agents that directly or indirectly causes injury to an employee of the contractor, or any subcontractor, supplier or materialman.

**A-44 Change Orders**

Should a change order(s) be required by the engineer, Contractor shall furnish the engineer a complete breakdown as to all prices charged for work of the change order (unit prices, hourly rates, sub-contractor's costs and breakdowns, cost of materials and equipment, wage rates, etc.). This breakdown information shall be submitted by contractor as a basis for the price of the change order.

**A-45 As-Built Dimensions and Drawings (7/5/00)**

- (a) Contractor shall make appropriate daily measurements of facilities constructed and keep accurate records of location (horizontal and vertical) of all facilities.
- (b) Upon completion of each facility, the Contractor shall furnish Owner with one set of direct prints, marked with red pencil, to show as-built dimensions and locations of all work constructed. As a minimum, the final drawings shall include the following:
  - (1) Horizontal and vertical dimensions due to substitutions/field changes.
  - (2) Changes in equipment and dimensions due to substitutions.
  - (3) "Nameplate" data on all installed equipment.
  - (4) Deletions, additions, and changes to scope of work.
  - (5) Any other changes made.

**A-46 Disposal of Highly Chlorinated water** (7/5/00)

The Contractor shall be responsible for the disposal of water used for testing, disinfection and line flushing in an approved manner. Contaminants in the water, particularly high levels of chlorine, will be used for disinfection, and may exceed the permissible limits for discharge into wetlands or environmentally sensitive areas. These are regulated by numerous agencies such as TNRCC, EPA, etc. It will be the Contractor's responsibility to comply with the requirements of all regulatory agencies in the disposal of all water used in the project. The methods of disposal shall be submitted to the City for approval. There shall be no separate pay for disposal of highly chlorinated water. Contractor shall not use the City's sanitary sewer system for disposal of contaminated water.

**A-47 Pre-Construction Exploratory Excavations** (7/5/00)

Prior to any construction whatever on the project, Contractor shall excavate and expose all existing pipelines of the project that cross within 20-feet of proposed pipelines of the project and Contractor shall survey the exact vertical and horizontal location of each crossing and potentially conflicting pipeline.

For existing pipelines which parallel and are within ten feet (10') of proposed pipelines of the project, Contractor shall excavate and expose said exiting pipelines at a maximum of 300-feet O.C. and Contractor shall survey the accurate horizontal and vertical locations of said parallel pipelines at 300-feet maximum O.C.

Contractor shall then prepare a report and submit it to the City for approval indicating the Owner of pipelines excavated and surveyed, as well as the approximate station thereof, distance to the pavement centerline and elevations of the top of existing pipelines.

**Contractor shall perform no construction work on the project until all exploratory excavations have been made in their entirety, the results thereof reported to the Engineer and until Contractor receives Engineer's approval of report.**

Exploratory excavations shall be paid for on a lump sum basis. Any pavement repair associated with exploratory excavations shall be paid for according to the established unit price of pavement patching. Contractor shall provide all his own survey work effort (no separate pay) for exploratory excavations.



**A-48 Overhead Electrical Wires** (7/5/00)

Contractor shall comply with all OSHA safety requirements with regard to proximity of construction equipment beneath overhead electrical wires. There are many overhead wires crossing the construction route and along the construction route. Contractor shall use all due diligence, precautions, etc., to ensure that adequate safety is provided for all of his employees and operators of equipment and with regard to ensuring that no damage to existing overhead electrical wires or facilities occurs.

Contractor shall coordinate his work with CP&L and inform CP&L of his construction schedule with regard to said overhead lines.

Some overhead lines are shown in the construction plans, while others are not. It shall be the Contractor's sole responsibility to provide for adequate safety with regard to overhead lines whether shown in the plans or not.

**A-49 Amended "Maintenance Guaranty"** (8/24/00)

Under "General Provisions and Requirements for Municipal Construction Contracts", B-8-11 Maintenance Guaranty, add the following:

"The Contractor's guarantee is a separate, additional remedy available to benefit the City of Corpus Christi. Neither the guarantee nor expiration of the guarantee period will operate to reduce, release, or relinquish any rights or remedies available to the City of Corpus Christi for any claims or causes of action against the Contractor or any other individual or entity."

SUBMITTAL TRANSMITTAL FORM

PROJECT: \_\_\_\_\_

OWNER: \_\_\_\_\_

ENGINEER: \_\_\_\_\_

CONTRACTOR: \_\_\_\_\_

SUBMITTAL DATE: \_\_\_\_\_

SUBMITTAL NUMBER: \_\_\_\_\_

APPLICABLE SPECIFICATION  
OR DRAWING

SUBMITTAL

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ATTACHMENT I

O. N. STEVENS WATER PLANT VISITOR/CONTRACTOR ON-SITE PERMIT

## O.N. STEVENS WATER TREATMENT PLANT VISITOR/CONTRACTOR ON-SITE PERMIT

As a visitor and/or contractor you will be required to adhere to our operational safety policies at all times while at the Plant. We require that you carefully read and familiarize yourself with the following information. **A visitor is defined as any person or student on a plant tour, consultant engineers, salespersons, other department city employees, fire fighters conducting training or testing activities, or any other person not employed by the City permanently assigned to the plant. A contractor is defined as any person employed by a construction firm under contractual agreement with the city to perform construction, maintenance, or service work.** Emergency response personnel responding to an emergency in the plant are exempt from reading this permit.

### FACILITY SECURITY

- > **All visitors and/or contractors, upon arrival, must register with the security guard at the main plant entrance.** Prior to leaving the Plant, you must be signed out as well. This must be done each time you enter or leave the Plant. The purpose of this is maintain an accurate roster of all persons in the plant at all times. This list will be turned over to the city police and risk management during an emergency.
  - > All **visitors** shall wear a numbered visitor's badge issued by the guard upon entry to the plant. All **contractors** shall wear a numbered contractor's badge issued by the guard upon entry to the plant. Badges shall be worn where they can be readily seen. All badges shall be returned to the guard when leaving the plant.
  - > **Visitors and contractors shall park their vehicles in the areas designated by the guard.** Contractors shall shuttle their employees from this designated parking area to their work site. Late arrivals shall walk to their work site. Only vehicles properly marked with company name shall be allowed in the work site location. Company vehicles shall have prior approval from the Water Production Superintendent before being allowed in the work area. City officials (elected and top management) and law enforcement officers are exempted from marking their vehicles.
- Non-plant vehicles shall not drive thru the canopy area adjacent to the Chemical Building.** This area has several blind spots and is an area with heavy pedestrian and chemical delivery traffic. Contractors shall drive along the back side of the plant to access any work area located west of the Chemical Building. The area map shows the route that shall be taken.
- > Please obey all posted traffic and informational signs. Unless otherwise posted, the **speed limit within the plant is 10 mph.**

- > Visitors and/or contractors will be escorted at all times while at the Plant unless authorized in writing by the Water Production Superintendent. If authorized to proceed unaccompanied, you will strictly limit yourself to only those areas specified in the written authorization.
- > **Contractors and visitors shall not operate any valve, pump, motor, or equipment.**

### USE OF PLANT FACILITIES

- > The plant has a limited quantity of **telephones intended for plant use only**. Use of plant telephones is prohibited unless permission is given by the Water Production Superintendent on a case by case basis. Contractors are required by the contract specifications to provide their own telephones.
- > The **photocopying machine located at the plant is intended for plant use only**. Use of the photocopier is prohibited unless permission is given by the Water Production Superintendent on a case by case basis.
- > The restroom facilities located in the plant are intended for plant employee and visitor use only. **Contractors are required by contract specifications to furnish their employees with portable restroom facilities located near their field offices or work areas**. Contractors working inside the buildings may use the plant restroom facilities.
- > Contractors coming inside to meet with plant operations or maintenance personnel shall insure not to track mud inside the building.

### SMOKING

- > **City ordinance prohibits smoking in public building**, city owned buildings, and in city vehicles. Smoking is prohibited in all buildings within the plant and in all water treatment areas.
- > There are two areas designated as smoking areas for office visitors: Outside the rear door of the Chemical Building and outside the East door of the Filter Building. Smoking is permitted inside contractors' vehicles. Cigarette butts shall be properly disposed of in proper receptacles. Cigarette butts shall not be disposed of on the plant grounds.
- > The Contractor may request a special area near his work site, but not inside his work area, to be designated as a smoking area for the duration of the his project. The Water Production Superintendent will allow smoking in this area as long as the cigarette butts are properly disposed of.

## **FOOD AND BEVERAGES**

- > The possession and/or consumption of food and/or beverages is prohibited outside of the designated "lunch room" in the Chemical Building, Laboratory Building, and Filter Building. These areas are limited in size and are reserved for plant employees and their guests only.
- > There are no food vending facilities within the plant. Contractors must either bring in their lunches or travel outside the plant for lunch. **Contractors may lunch in their field offices, private vehicles, company vehicles** or in a special area designated by the Water Production Superintendent.
- > Trash shall be properly disposed of. Contractors shall be responsible for insuring that their employees are properly disposing of their trash. Contractors shall be responsible for disposing of their field office trash on a daily basis.
- > **Possession of illegal drugs or alcohol are grounds for immediate expulsion** from the Plant. Persons expelled from the Plant due to possession of drugs may be refused reentry into the Plant.

## **SAFETY EQUIPMENT**

- > **All visitors and contractors shall wear hard hats** when visiting or working at the plant. Hard hats are optional in the offices, lab, control room, and the crew ready room. Hard hats will be issued by the guard only to visitors of the plant manager. The plant does not provide hard hats to contractors or visitors of contractors. Contractors shall furnish hard hats to their employees and their visitors.
- > Contractors shall issue hard hats, safety goggles, hearing protection and other safety equipment as required to work in the facility. Construction crews are required to wear safety shoes. Visitors and consultants that are going to be primarily in the office area are not required to wear safety shoes.
- > **The contractor's construction crew shall wear uniforms with the company's name.** The contractor has the color option other than blue, white, or orange which are reserved for the plant employees. The uniforms may be long sleeve shirts and jeans or overalls. Contractors that are required to wear orange or green safety vests by their company may do so as long as the vests have company identification on them.

## **CONFINED SPACE ENTRY PERMIT**

- > No one shall enter a confined space without first obtaining a "**Confined Space Entry Permit**" from either the Maintenance Superintendent or the Safety Coordinator. Persons entering the confined space shall be properly equipped, backed-up, and supported by the required number of personnel.

- > A confined space is defined as any space subject to but not limited to the following conditions:
  - >An area not normally occupied by personnel.
  - >An area with limited access.
  - >An area with limited air circulation.
- > Contractors shall refer to the Federal Register, 29 CFR Parts 1910.146 for the complete rules and regulations.

## **EMERGENCIES**

- > The Plant has a specific and detailed Emergency Contingency Plan covering fires, explosions, release(s) of hazardous materials to the air or to the ground, injured or ill personnel requiring immediate medical assistance, intrusion of unauthorized persons, any other event(s) not listed which present an imminent hazard to personnel, equipment, facilities, or the environment.
- > Should you observe any of the above conditions, immediately notify the nearest Plant personnel and follow their instructions regarding safety actions to take.
- > During an emergency, **the Water Production Superintendent is the "On Scene Incident Commander"** until the first uniformed public safety officer, either Police or Fire, arrives.
- > In case of an emergency, the assembly location for those working near the chemical building shall be the Ready Room located in the Chemical Building. The office space and the Ready Room of the Chemical Building are air conditioned with a positive pressurization system. For those persons working in areas that are not able to get to the Ready Room because of the wind direction, shall assemble in the their field office, the Guard House, or any other safe location up wind of the "hot zone". If assembly in a location other than the Ready Room or the Guard House, call the **guard at 861-1221** and give him a head count and a list of names of those persons sheltering at that location. Stay off the telephone as much as possible so that you may be contacted.
- > All accidents or injuries must be reported immediately to the Plant Supervisor.
- > In the event the Emergency Contingency Plan is implemented, follow all instructions given to you by O.N. Stevens Water Plant employees since all Plant employees are trained in emergency response. Do not initiate any action on your own.

## **FIREARMS**

- > **Firearms are not allowed to be carried into the plant** premises either in vehicles or on a person's body. Active duty law enforcement officers are exempt. Concealed weapon permits will not be honored at the plant.

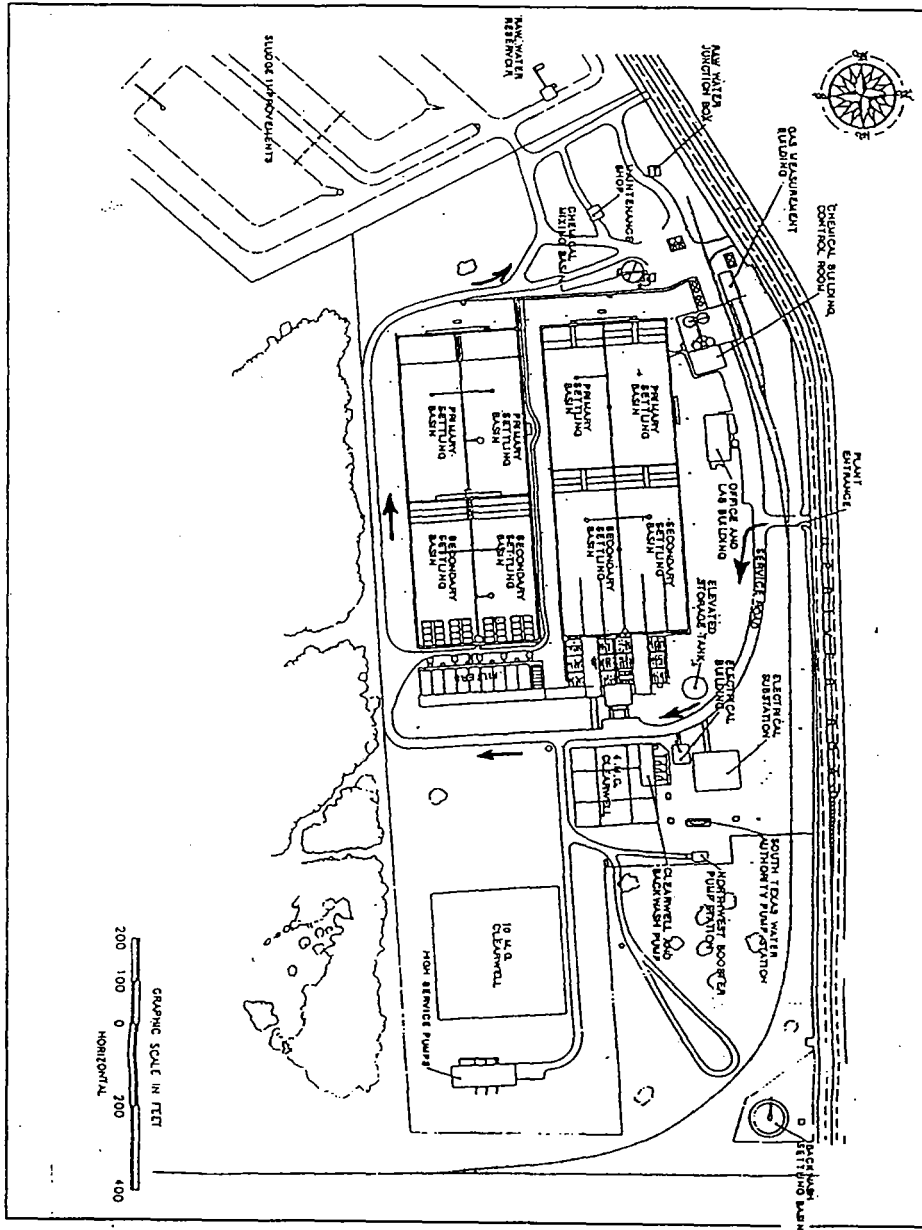
## **EMERGENCY COORDINATORS**

- > Primary Coordinator - Mucio Garza, P.E., Water Production Superintendent, ph 861-1212, pager 880-9706.
- > First Alternate - On duty shift supervisor, Plant Supervisor III, ph 861-1215.
- > Second Alternate - Frank Rodriguez, Maintenance Superintendent, ph 861-1214.
- > Confined Space Entry Permits - Maintenance Superintendent or his designee, ph 861-1214, or Safety Coordinator, ph 861-1223.

**NOTE:** Contractors who will be engaged in construction activities at this facility for extended periods of time will be required to receive additional training.

Visitor/Contractor to retain pages 1 thru 6 for their information.





1 Location Map

**O.N. STEVENS WATER TREATMENT PLANT  
VISITOR/CONTRACTOR AGREEMENT**

(Must be returned to O.N. Stevens Plant Signed and Dated before entry will be permitted.)

I, \_\_\_\_\_, have read and understand these  
Name (Please PRINT in all caps)

requirements and agree to abide by them as a condition to my being allowed access to the O.N. Stevens Water Plant. I understand that failing to comply with any of these requirements may result in my being asked to leave the Plant.

SIGNED: \_\_\_\_\_

DATE: \_\_\_\_\_

EMPLOYED BY: \_\_\_\_\_  
(No abbreviations, please PRINT in all caps)

ADDRESS: \_\_\_\_\_

CITY: \_\_\_\_\_

STATE: \_\_\_\_\_

ZIP CODE: \_\_\_\_\_

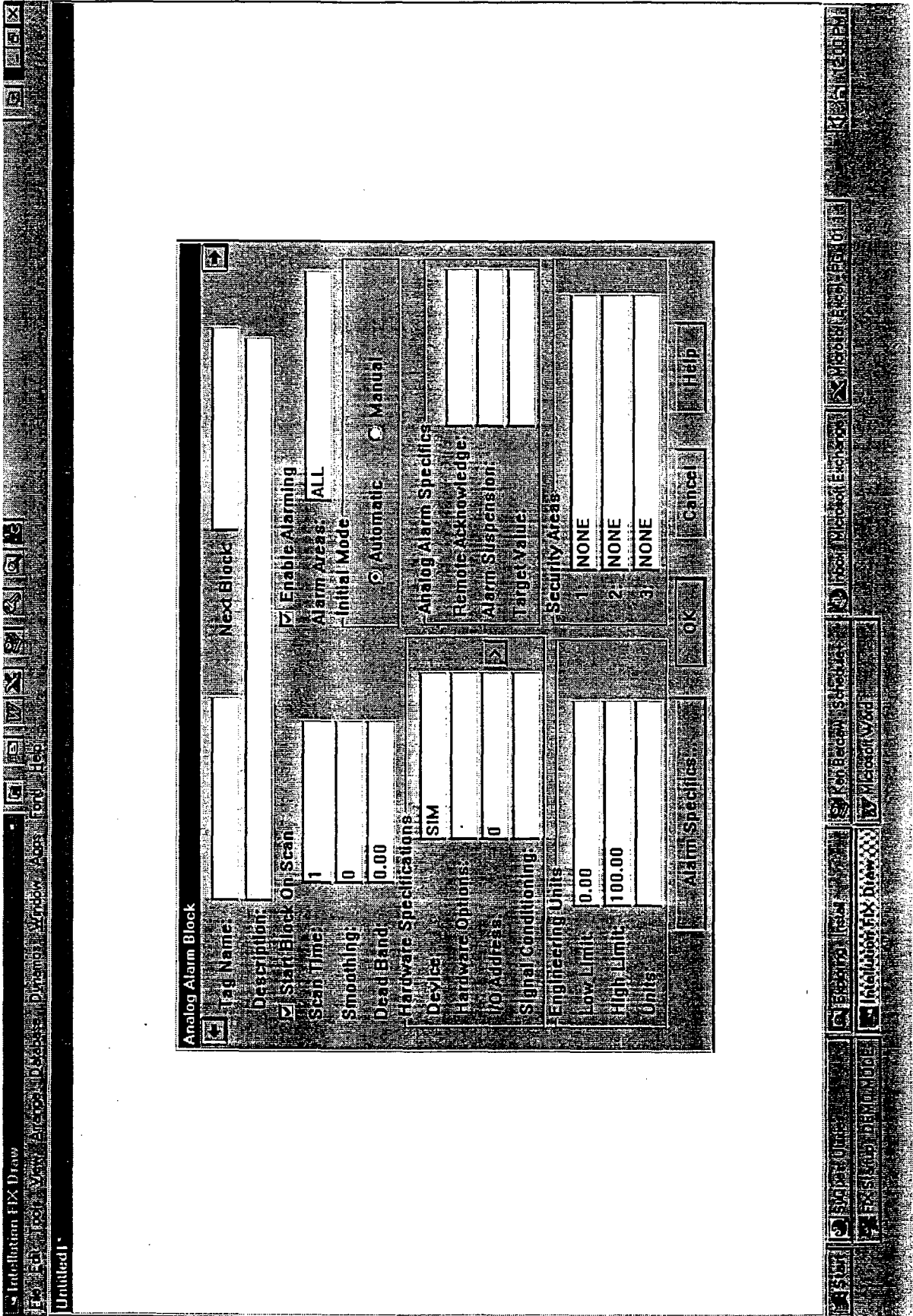
WITNESSED BY: \_\_\_\_\_

EMPLOYED BY: \_\_\_\_\_

**ATTACHMENT II**

**EXAMPLE - PROGRAMMING BLOCKS**

# EXAMPLE



**Supplemental  
SPECIAL PROVISIONS**

1. **PRIVITY OF CONTRACT**

This contract is expected to be funded in part with funds from the Texas Water Development Board. Neither the State of Texas nor any of its departments, agencies or employees is, or will be, a party to this contract or any lower tier contract. This contract is subject to regulations contained in 31 TAC Chapter 363 in effect on the date this contract is executed.

2. **DEFINITION**

THE TERM "TWDB" means the Executive Administrator of the Texas Water Development Board, or other person who may be at the time acting in the capacity or authorized to perform the functions of such Administrator, or the authorized representative thereof.

3. **WITHHOLDING PAYMENTS**

The Owner may withhold from any payment otherwise due the Contractor so much as may be necessary to protect the Owner and, if so elects, may also withhold any amounts due from the Contractor to any subcontractors or material dealers, for work performed or material furnished by them. The foregoing provisions shall be construed solely for the benefit of the Owner and will not require the Owner to determine or adjust any claims or disputes between the Contractor and his subcontractors or material dealers, or to withhold any moneys for their protection unless the Owner elects to do so. The failure or refusal of the Owner to withhold any moneys from the Contractor shall in no way impair the obligations of any surety or sureties under any bond or bonds furnished under this Contract.

Withholding of any amount due the Owner, under general and/or special conditions regarding "Liquidated Damages", shall be deducted from partial and final payment due the Contractor.

The retainage and its interest earnings, if any, shall not be paid to the Contractor until the TWDB has authorized a reduction in, or release of, retainage on the contract work.

4. **PAYMENTS SUBJECT TO SUBMISSION OF CERTIFICATES**

Each payment to the Contractor by the Owner shall be made subject to submission by the Contractor of all written certifications required of him and his subcontractors by general or special conditions elsewhere in this contract.

5. **REVIEW BY OWNER AND TWDB**

- (a) The Owner, authorized representatives and agents of the Owner, and the TWDB shall, at all times, have access to and be permitted to observe and review all work, materials, equipment, payrolls, personnel records, employment conditions, material invoices, and other relevant data and records pertaining to this Contract, provided, however that all instructions and approval with respect to the work will be given to the Contractor only by the Owner through authorized representatives or agents.
- (b) Any such inspection or review by the TWDB shall not subject the State of Texas to any action for damages.

6. **FLOOD HAZARD INSURANCE**

These provisions apply to any contract which will construct structures that are insurable under the National Flood Insurance Program of the Federal Emergency Management Agency. The Contractor shall apply for flood insurance on all insurable structures that will be built under this contract. A copy of the completed application must be provided to the Owner before commencing construction of the project. The Contractor shall obtain the flood hazard insurance as soon as possible and submit a copy of the policy to the Owner.

7. **OPERATION AND MAINTENANCE MANUALS AND TRAINING**

- (a) The Contractor shall obtain installation, operation, and maintenance manuals from manufacturers and suppliers for equipment furnished under the contract. The Contractor shall submit three (3) copies of each complete manual to the Engineer within 90 days after approval of shop drawings, product data, and samples, and not later than the date of shipment of each item of equipment to the project site or storage location.
- (b) Each manual is to be bound in a folder and labeled to identify the contents and project to which it applies. The manual shall contain the following applicable items:
  - (1) A listing of the manufacturer's identification, including order number, model, serial number, and location of parts and service centers.
  - (2) A list of recommended stock of parts, including part number and quantity.
  - (3) Complete replacement parts list.
  - (4) Performance data and rating tables.
  - (5) Specific instructions for installation, operation, adjustment, and maintenance.
  - (6) Exploded view drawings for major equipment items.
  - (7) Lubrication requirements.
  - (8) Complete equipment wiring diagrams and control schematics with terminal identification.
- (c) Operations and maintenance manuals specified herein are in addition to any operation, maintenance or installation instructions required by the Contractor to install, test, and start-up the equipment.
- (d) The Owner shall require the Engineer to promptly review each manual submitted, noting necessary corrections and revisions. If the Engineer rejects the manual, the Contractor shall correct and re-submit the manual until it is acceptable to Engineer as being in conformance with design concept of project and for compliance with information given in the Contract Documents. Owner may assess Contractor a charge for review of same items in excess of three (3) times. Such procedure shall not be considered cause for delay. Acceptance of manuals by Engineer does not relieve Contractor of any requirements or terms of the Contract.
- (e) The Contractor shall provide the services of trained, qualified technicians to check final equipment installation, to assist as

required in placing same in operation, and to instruct operating personnel in the proper manner of performing routine operation and maintenance of the equipment.

8. **AS-BUILT DIMENSION AND DRAWINGS**

- (a) Contractor shall make appropriate daily measurements of facilities constructed and keep accurate records of location (horizontal and vertical) of all facilities.
- (b) Upon completion of each facility, the Contractor shall furnish Owner with one set of direct prints, marked with red pencil, to show as-built dimensions and locations of all work constructed. As a minimum, the final drawings shall include the following:
  - (1) Horizontal and vertical dimensions due to substitutions.
  - (2) Changes in equipment and dimensions due to substitutions.
  - (3) "Nameplate" data on all installed equipment.
  - (4) Deletions, additions, and changes to scope of work.
  - (5) Any other changes made.

9. **ARCHEOLOGICAL DISCOVERIES**

No activity which may affect a State Archeological Landmark is authorized until the Owner has complied with the provisions of the Antiquities Code of Texas. The Owner has previously coordinated with the appropriate agencies and impacts to known cultural or archeological deposits have been avoided or mitigated. However, the Contractor may encounter unanticipated cultural or archeological deposits during construction.

If archeological sites or historic structures are discovered after construction operations are begun, the Contractor shall immediately cease operations in that particular area and notify the Owner, the TWDB, and the Texas Historical Commission (512/463-6096). The Contractor shall take reasonable steps to protect and preserve the discoveries until they have been inspected by the Owner's representative and the TWDB. The Owner will promptly coordinate with the Texas Historical Commission and any other appropriate agencies to obtain any necessary approvals or permits to enable the work to continue. The Contractor shall not resume work in the area of the discovery until authorized to do so by the Owner.

10. **ENDANGERED SPECIES**

No activity is authorized that is likely to jeopardize the continued existence of a threatened or endangered species as listed or proposed for listing under the Federal Endangered Species Act (ESA), and/or the State of Texas Parks and Wildlife Code on Endangered Species, or to destroy or adversely modify the habitat of such species.

If a threatened or endangered species is encountered during construction, the Contractor shall immediately cease work in the area of the encounter and notify the Owner, who will immediately implement actions in accordance with the ESA and applicable State statutes. These actions shall include reporting the encounter to the TWDB, the U.S. Fish and Wildlife Service, and the Texas Parks and Wildlife Department, obtaining any necessary approvals or permits to enable the work to continue, or implement other

mitigative actions. The Contractor shall not resume construction in the area of the encounter until authorized to do so by the Owner.

11. LAWS TO BE OBSERVED

In the execution of the Contract, the Contractor must comply with all applicable Local, State and Federal laws, including but not limited to laws concerned with labor, safety minimum ages, and the environment. The Contractor shall make himself familiar with and at all times shall observe and comply with all Federal, State, and Local laws, ordinances and regulations which in any manner affect the conduct of the work, and shall indemnify and save harmless the Owner, the TWDB, and their representatives against any claim arising from violation of any such law, ordinance or regulation by himself or by his subcontractor or his employees.

12. EMPLOYMENT OF LOCAL LABOR

This condition applies only to construction contracts which receive funding from the TWDB's Economically Distressed Areas Program.

The Contractor shall, to the maximum feasible extent, employ local labor for construction of the project. The Contractor and every subcontractor undertaking to do work on the project which is, or reasonably may be done as on-site work, shall employ, in carrying out such contract work, qualified persons who regularly reside within the political subdivision boundary of the Owner and the economically distressed area where the project is located, except:

- (a) To the extent that qualified persons regularly residing within the political subdivision boundary of the Owner and economically distressed area are not available.
- (b) For the reasonable needs of any such Contractor or subcontractor, to employ supervisory or specially experienced individuals necessary to assure an efficient execution of the contract.
- (c) For the obligation of any such Contractor or subcontractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that in no event shall the number of non-resident persons employed under this subparagraph exceed twenty percent (20%) of the total number of employees employed by such Contractor and his/her subcontractors on such project.

Every such Contractor and subcontractor shall furnish the Owner and the Local Texas Employment Commission Office with a list of all positions for which it may, from time to time, require laborers, mechanics, and other employees, the estimated numbers of employees required in each classification, and the estimated dates on which such employees will be required.

The contractor shall give full consideration to all qualified job applicants referred by the local employment service, but is not required to employ any job applicants referred whom the Contractor does not consider qualified to perform the classification of work required.

The payrolls maintained by the Contractor shall contain the following information: The employee's full name, address, and social security number, and a notation indicating whether the employee does, or does not, normally reside within the political subdivision boundary of the Owner or the economically distressed area. Copies of the payroll records shall be provided to the Owner.



The Contractor shall include the provisions of this condition in every subcontract for work which is, or reasonably may be, done as on-site work.

13. **HAZARDOUS MATERIALS**

Materials utilized in the project shall be free of any hazardous materials, except as may be specifically provided for in the specifications.

If the Contractor encounters existing materials on sites owned or controlled by the Owner or in material sources that are suspected by visual observation or smell to contain hazardous materials, the Contractor shall immediately notify the Engineer and the Owner. The Owner will be responsible for the testing for and removal or disposition of hazardous materials on sites owned or controlled by the Owner. The Owner may suspend the work, wholly or in part during the testing, removal or disposition of hazardous materials on sites owned or controlled by the Owner.

SECTION B

GENERAL PROVISIONS AND REQUIREMENTS  
FOR MUNICIPAL CONSTRUCTION CONTRACTS

Table of Contents

	<u>PAGE</u>
<u>B-1 Definitions and Abbreviations</u>	
B-1-1 Definition of Terms . . . . .	1
B-1-2 Abbreviations . . . . .	3
<u>B-2 Proposal Requirements and Conditions</u>	
B-2-1 Proposal Forms . . . . .	4
B-2-2 Quantities in Proposal Forms . . . . .	4
B-2-3 Examination of Plans, Specifications, and Site of the Work . . . . .	4
B-2-4 Forms, Plans and Specifications . . . . .	4
B-2-5 Addenda . . . . .	4
B-2-6 Pre-Bid Conference . . . . .	5
B-2-7 Preparation of Proposal . . . . .	5
B-2-8 Proposal Guaranty . . . . .	5
B-2-9 Filing of Proposal . . . . .	5
B-2-10 Withdrawing Proposals . . . . .	5
B-2-11 Cancellation of Bid Opening . . . . .	6
B-2-12 Opening Proposals . . . . .	6
B-2-13 Irregular Proposals . . . . .	6
B-2-14 Rejection of Proposals . . . . .	6
B-2-15 Disqualification of Bidders . . . . .	6
B-2-16 Disclosure of Interests . . . . .	6
<u>B-3 Award and Execution of Contract</u>	
B-3-1 Consideration of Contract . . . . .	7
B-3-2 Award of Contract . . . . .	7
B-3-3 Equal Opportunity Employer Provisions . . . . .	7
B-3-4 Surety Bonds . . . . .	8
B-3-5 Execution of Contract . . . . .	8
B-3-6 Failure to Execute Contract . . . . .	8
<u>B-4 Scope of Work</u>	
B-4-1 Intent of Plans and Specifications . . . . .	9
B-4-2 Subsidiary Work . . . . .	9
B-4-3 Increased or Decreased Quantities of Work . . . . .	9
B-4-4 Alteration of Plans and Specifications . . . . .	10
B-4-5 Value Engineering Incentive Procedures . . . . .	10
B-4-6 Extra Work . . . . .	11
<u>B-5 Control of the Work and Materials</u>	
B-5-1 Authority of the City Engineer . . . . .	11
B-5-2 Authority of Duty of Engineers or Inspectors . . . . .	11
B-5-3 Conformity with Plans . . . . .	11
B-5-4 Existing Structures . . . . .	11
B-5-5 Coordination of Plans, Specifications, Proposal & Special Provision . . . . .	12
B-5-6 Cooperation of Contractor . . . . .	12
B-5-7 Construction Staking . . . . .	12
B-5-8 Source of Supply of Materials . . . . .	13
B-5-9 Samples and Tests of Materials . . . . .	13
B-5-10 "Or Equal" Clause . . . . .	13
B-5-11 Storage of Materials . . . . .	13
B-5-12 Removal of Defective and Unauthorized Work . . . . .	13
B-5-13 Final Inspection . . . . .	14
B-5-14 Warranty Inspection . . . . .	14

<b><u>B-6 Legal Relations and Public Responsibility</u></b>		
B-6-1	Laws to be Observed . . . . .	14
B-6-2	Permits and Licenses . . . . .	14
B-6-3	Patented Devices, Materials and Processes . . . . .	15
B-6-4	Sanitary Provisions . . . . .	15
B-6-5	Public Conveniences and Safety . . . . .	15
B-6-6	Privileges of contractor in Streets, Alleys and Right-of-Way . . . . .	16
B-6-7	Railway Crossings . . . . .	16
B-6-8	Traffic Control Devices . . . . .	16
B-6-9	Use of Explosives . . . . .	16
B-6-10	Protection and Restoration of Property . . . . .	16
B-6-11	Responsibility for Damage Claims . . . . .	17
B-6-12	Contractor's Claim for Damages . . . . .	19
B-6-13	Public Utilities and Other Property to be Changed . . . . .	19
B-6-14	Temporary Sewer and Drain Connections . . . . .	19
B-6-15	Arrangement and Charge for Water Furnished by the City . . . . .	19
B-6-16	Use of fire Hydrants . . . . .	19
B-6-17	Use of a Section or Portion of the Work . . . . .	19
B-6-18	Separate Contracts . . . . .	20
B-6-19	Contractor's Responsibility for the Work . . . . .	20
B-6-20	No Waiver of Legal Right . . . . .	20
B-6-21	Indemnification and Hold Harmless . . . . .	20
B-6-22	Tax Exemption Provisions . . . . .	20
 <b><u>B-7 Prosecution and Progress</u></b>		
B-7-1	Subletting the Work . . . . .	21
B-7-2	Assignment of Contract . . . . .	21
B-7-3	Prosecution of the Work . . . . .	21
B-7-4	Limitation of Operations . . . . .	22
B-7-5	Character of Workmen and Equipment . . . . .	22
B-7-6	Working Hours . . . . .	22
B-7-7	Time of Commencement and Completion . . . . .	22
B-7-8	Extension of Time of Completion . . . . .	22
B-7-9	Computation of Contract Time for Completion . . . . .	23
B-7-10	Failure to complete on Time . . . . .	23
B-7-11	Suspension by court Order . . . . .	23
B-7-12	Temporary Suspension . . . . .	23
B-7-13	Suspension of Work and Annulment of Contract . . . . .	24
B-7-14	Termination of Contract . . . . .	25
 <b><u>B-8 Measurement and Payment</u></b>		
B-8-1	Measurement of Quantities . . . . .	25
B-8-2	Unit Price . . . . .	25
B-8-3	Scope of Payment . . . . .	25
B-8-4	Payment for Extra Work . . . . .	26
B-8-5	Policy of Extra Work and Change Orders . . . . .	26
B-8-6	Partial Estimates . . . . .	27
B-8-7	Withholding Payment . . . . .	27
B-8-8	Final Cleanup . . . . .	27
B-8-9	Final Acceptance . . . . .	28
B-8-10	Final Payment . . . . .	28
B-8-11	Maintenance Guaranty . . . . .	28

This bond is given to meet the requirements of Article 5160, Vernon's Civil Statutes of Texas, and other applicable statutes of the state of Texas. The terms "Claimant", "Labor" and "Material", as used herein are in accordance with and as defined in said Article.

The undersigned agent is hereby designated by the Surety herein as the Agent Resident in Nueces County to whom any requisite notices may be delivered and on whom service of process may be had in matters arising out of such suretyship, as provided by Art. 7.19-1, Vernon's Texas Insurance Code.

**IN WITNESS WHEREOF**, This instrument is executed in 4 copies, each one of which shall be deemed an original, this the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

**PRINCIPAL**

\_\_\_\_\_

By: \_\_\_\_\_

**ATTEST**

\_\_\_\_\_

Secretary

**SURETY**

\_\_\_\_\_

\_\_\_\_\_

By: \_\_\_\_\_

Attorney-in-fact

The Resident Agent of the Surety in Nueces County, Texas, for delivery of notice and service of process is:

NAME: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

(P. O. Box) (Street Address)

(City) (State) (Zip)

(Note: Date of Payment Bond must not be prior to date of contract)

(Revised August 2000)

SECTION B

GENERAL PROVISIONS AND REQUIREMENTS  
FOR MUNICIPAL CONSTRUCTION CONTRACTS  
CITY OF CORPUS CHRISTI, TEXAS

B-1 DEFINITIONS AND ABBREVIATIONS:

B-1-1 Definition of Terms:

Wherever the words, forms or phrases defined herein or pronouns used in their place occur in these specifications, in the contract, in the bonds, in the advertisement or any other documents or instrument herein contemplated, or to which these specifications apply or may apply, the intent and meaning shall be interpreted as follows:

Advertisement: All of the legal publications pertaining to the work contemplated or under contract.

Bidder: Any person, persons, partnership, company, firm, association, corporation, or joint venture acting directly or through a duly authorized representative submitting a proposal for work contemplated.

City: The City of Corpus Christi, Texas, a municipal corporation, acting by and through (a) its governing body or (b) its City Manager, each of whom is required by Charter to perform specific duties. Responsibility for final enforcement of contracts involving the City of Corpus Christi is, by Charter, vested in the City Manager.

City Attorney: The City Attorney of the City of Corpus Christi, Texas, or duly authorized assistants or agents.

City Council: The Council of the City of Corpus Christi, Texas.

City Engineer: The Head of the Department of Engineering Services of the City of Corpus Christi, Texas.

City Manager: The Manager of the City of Corpus Christi, Texas.

City Secretary: The City Secretary of the City of Corpus Christi, Texas, or duly authorized assistants or agents.

Contract: The written agreement covering the performance of the work. The contract includes the advertisement; proposal; specifications, including special provisions; plans or working drawings; any supplemental changes or agreements pertaining to the work or materials therefor, and bonds.

Contract Time: The number of calendar days or working days allowed for completion of the contract, including any authorized time extensions.

(a) Calendar Day: A calendar day is defined as any day shown on the calendar beginning and ending at midnight.

(b) Working Day: a working day is defined as a calendar day, not including Sundays or legal holidays, in which the weather or other conditions affecting the site, not under the control of the Contractor, will in the judgement of the Engineer permit the performance of some substantial unit of work for a substantially continuous period of time of not less than six (6) hours between 7 a.m. and 6 p.m., or during such other hours of the day as the Contractor does in fact work with the permission of the Engineer as elsewhere provided.

Each calendar day, not including Sundays or legal holidays, in which the Contractor carries on work on some unit of the contract for a period of more than six (6) hours shall be charged as one (1) working day, regardless of the number of hours worked in excess of the (6) hour minimum. Saturday will not be charged

as a working day unless work of any type requiring the presence of the Engineer is in fact carried on for any period of time during the day.

On Sundays and legal holidays on which, by previous written permission of the Engineer as elsewhere provided, the Contractor works as much as four hours on some unit of the contract, two working days shall be charged. If, under such permission, work is commenced but proceeds less than four hours, one working day shall be charged. In the determination of the hours above, no deduction shall be made for lunch time taken.

Contractor: The person, persons, partnership, company, firm, association, corporation, or joint venture entering into contract for the execution of the work, acting directly or through a duly authorized representative.

Engineer: Assistants, agents, engineers, inspectors, or superintendents duly authorized by the City Engineer and acting within the scope of the particular duties entrusted to them.

General Provisions: This Section B of the specifications.

Holidays: The terms regular holidays and legal holidays, for the purposes of charging working days, control of working days and hours, and wages of employees, shall include the following:

January 1 (New Year's Day)	July 4 (Independence Day)	Thanksgiving Days
Memorial Day	Labor Day	Christmas Day

Maintenance Guaranty: The approved form of security furnished by the Contractor and his surety as a guarantee that he will maintain the work constructed by him in good condition for the period of time required. This shall be in accordance with the provisions of the specifications and may be made a part of the Performance Bond.

Payment Bond: The approved form of security furnished by the contractor and his surety for the use and benefit of the City as a guarantee for the protection of all claimants supplying labor and/or material in the prosecution of the work provided for in this contract.

Performance Bond: The approved form of security furnished by the contractor and his surety for the use and benefit of the City as a guarantee of good faith on the part of the Contractor to execute the work in strict accordance with the plans, specifications, and terms of the contract, and that the Contractor will maintain the work constructed by him in good condition for the period of one year or such other period of time as may be specially provided.

Plan or Plans: All the drawings pertaining to the contract and made a part thereof, including such supplemental drawings or addenda as the City Engineer may issue in order to clarify other drawings or for the purpose of showing changes in the work hereinafter authorized, or for showing details not shown thereon.

Proposal: The written statement or statements duly filed with the City Secretary of the person, persons, partnership, company, firm, association, corporation, or joint venture proposing to do the work contemplated, including the approved form on which the formal bids for the work are to be prepared.

Proposal Guaranty: The bid security designated in the advertisement and proposal to be furnished by each bidder as a guarantee of good faith to enter into a contract with the City and execute the required bonds for the work contemplated after the work is awarded him.

Special Provisions: The special clauses setting forth conditions or requirements peculiar to the specific project involved, supplementing the standard specifications, and taking precedence over any conditions or requirements of the standard specifications with which they are in conflict.

**Specifications:** The directions, provisions, and requirements contained herein, together with the special provisions supplemental hereto, pertaining to the method and manner of performing the work or to the qualities or quantities of the material to be furnished under the contract.

**Sureties:** The corporate bodies which are bound by such bonds as are required with and for the Contractor.

**The Work:** All work, including the furnishing of labor, materials, tools, equipment, and incidentals, to be performed by the Contractor under the terms of the contract.

**B-1-2 Abbreviations:**

Wherever the abbreviations defined herein occur on the plans, in the specifications, contract, bonds, advertisement, proposal, or in any other document or instrument herein contemplated or to which the specifications apply or may apply, the intent and meaning shall be as follows:

A.A.S.H.T.O.	American Association of State Highway and Transportation Officials	H.S.	Horseshoe
Ac.	Acre	In. or "	Inches
A.C.	Asbestos Cement	Lb. or #	Pound
A.C.I.	American Concrete Institute	L.F.	Linear Foot
A.N.S.I.	American National Standards Institute	Lin.	Linear
Asph.	Asphalt	L.S.	Lump Sum
A.S.T.M.	American Society for Testing Materials	Max.	Maximum
Ave.	Avenue	M.H.	Manhole
A.W.P.A.	American Wood Preservers Association	Min.	Minimum
A.W.S.	American Welding Society	Mono.	Monolithic
A.W.W.A.	American Water Works Association	M.U.T.C.D.	Manual of Uniform Traffic Control Devices
Blvd.	Boulevard	N.	North
C.F.	Cubic Foot	No.	Number
C.I.	Cast Iron	%	Percent
C.L.	Center Line	P.L.	Property Line
C.M.P.	Corrugated Metal Pipe	Prop.	Proposed or Property
C.O.	Cleanout	P.V.C.	Poly Vinyl Chloride
Conc.	Concrete	R.	Radius
Cond.	Conduit	R.C.P.	Reinforced Concrete Pipe
Corr.	Corrugated	Reinf.	Reinforced
C.P. & L.	Central Power & Light Company	Rem.	Remove
Cu.	Cubic	Rep.	Replace
Culv.	Culvert	R.R.	Railroad
C.Y.	Cubic Yard	R/W or ROW	Right-of-Way
D.I.	Ductile Iron	S.	South
Dia.	Diameter	San.	Sanitary
Dr. or Dwy	Drive or Driveway	S.F.	Square Foot
E.	East	Sq.	Square
Ea.	Each	St.	Street or Storm
Elev.	Elevation	Std.	Standard
Exist.	Existing	S.Y.	Square yard
F.	Fahrenheit	T.C.	Top of Curb
F.L.	Flow Line	Tel.	Telephone
Ft. or '	Feet	V.F.	Vertical Foot
Gal.	Gallon	W.	West
G.L.	Gutter Line	W.U.T.	Western Union Telegraph
G.P.M.	Gallons per Minute	Yd.	Yard
H.N.G.	Houston Natural Gas Co.		
<b>Metrics:</b>			
cm	Centimeter	m	Meter
gm	Gram	mgm	Milligram
kgm	Kilogram	mm	Millimeter
km	Kilometer		

Other abbreviations that may appear shall have the meaning customarily intended in such usage, circumstances, and context.

**B-2 PROPOSAL REQUIREMENTS AND CONDITIONS:**

**B-2-1 Proposal Form:**

The City will furnish bidders with proposal forms which state the general location and description of the contemplated work, and which will contain an itemized list of items of work to be done or materials to be furnished, and upon which bid prices are asked. The proposal form will provide for the amount of proposal guaranty, the contract time, and the acknowledgement of addenda received.

**B-2-2 Quantities in Proposal Form:**

The quantities of the work and materials set forth in the proposal form or on the plans approximately represent the work to be performed and materials to be furnished and are for the purpose of comparing the bids on a uniform basis. Payment will be made by the City to the Contractor only for the actual quantities of work performed or materials furnished in accordance with the plans and specifications, and it is understood that the quantities may be increased or decreased as hereinafter provided without in any way invalidating the bid price.

**B-2-3 Examination of Plans, Specifications, and Site of the Work:**

Bidders are advised that the plans and specifications and other documents on file with the City Engineer shall constitute all of the information which the City will furnish. Bidders are required, prior to submitting any proposal, to read the specifications, proposal, contract, and bond forms carefully; to visit the site of the work; to examine carefully local conditions, soil and water conditions to be encountered, improvements to be protected, disposal sites for surplus materials not designated to be salvaged materials, methods of providing ingress or egress to private properties, and methods of handling traffic; to inform themselves, by their independent research, tests, and investigation, of the difficulties to be encountered and judge for themselves of the accessibility of the work and all attending circumstances affecting the cost of doing the work or time required for its completion; and obtain all information required to make an intelligent proposal. No information given by the City or any official thereof, other than that shown on the plans and contained in the specifications, proposal, and other documents, shall be binding upon the City. Bidders shall rely exclusively upon their own estimates, investigations, tests, and other data which are necessary for full and complete information upon which the proposal may be based. It is mutually agreed that submission of a proposal is evidence that the bidder has made the examinations, investigations, and tests required herein.

**B-2-4 Forms, Plans and Specifications:**

Unless otherwise specified in the Notice to Bidders and Special Provisions, forms of proposal, contract and bonds and plans and specifications may be obtained at the offices of the City Engineer in the City Hall upon making a Plans Deposit as designated, which sum so deposited will be refunded provided the prospective bidder returns all documents, except proposal form if bidding, to the offices of the City Engineer within two (2) weeks from and after the time and date of receiving proposals. If the prospective bidder does not comply with this requirement, the sum of the Plans Deposit shall become the property of the City of Corpus Christi, Texas.

**B-2-5 Addenda:**

Addenda to the plans and specifications, which are formal written notices of additions, deletions, modifications, or explanations of contract documents from the City to prospective bidders in advance of the bid date, may be issued by the City Engineer. Such addenda will be mailed immediately to the address designated by prospective bidders taking out plans, specifications, and proposal forms.



**B-2-6 Pre-Bid Conference:**

Any prospective bidder may request a pre-bid conference to discuss the plans, specifications, and proposal. If such a conference is requested, it will be held approximately one week prior to the bid opening. Each prospective bidder who has furnished the Plans Deposit required by the Notice to Bidders will be notified of the date, time, and location of the pre-bid conference. Any clarification to the contract documents deemed necessary as a result of the pre-bid conference will be made by written addenda.

**B-2-7 Preparation of Proposal:**

The bidder shall submit his proposal on the forms furnished by the City. All blank spaces in the forms shall be correctly filled in, and the bidder shall state the prices, written in ink, for which he proposes to do the work contemplated or furnish the material required; the unit prices shall be written both in words and numerals. Such prices shall be written distinctly legible. In case of discrepancy between the unit price written in words and the unit price written in figures, the unit price written in words shall govern. The unit price shall govern over the amount. If the proposal is submitted by an individual, his name must be signed by him or his duly authorized agent. If the proposal is submitted by a firm, association, or partnership, the name and address of each member must be given and the proposal signed by a member of the firm, association, or partnership, or person duly authorized. If the proposal is submitted by a company or corporation, the company or corporate name and business address must be given and the proposal signed by an official or duly authorized agent. Proposals submitted by a joint venture shall list all participants and their addresses. Powers of attorney, authorizing agents or others to sign proposals, must be properly certified and must be in writing and submitted with the proposal.

**B-2-8 Proposal Guaranty:**

No proposal will be considered unless accompanied by an individual bid security (bond) for the project in the amount of five percent (5%) of the highest amount bid. Such bid security shall be issued by a firm licensed for issuance in the State of Texas. A cashier's check, certified check, money order, or bank draft from any state or national bank will also be acceptable. The security shall be deemed a good faith offer on the part of the bidder to accept a contract, if awarded. In the event the successful bidder declines to accept such award or cannot provide the required bonds and insurance certificates within ten (10) calendar days of the award of the contract, then the amount of the bid security will become the property of the City, not as penalty but as liquidated damages.

The bid securities of the unsuccessful bidders may be released within forty-eight (48) hours of the time bids are received. The bid security of the successful bidder will be released upon execution of the contract documents and submission of the required bonds and certificates.

**B-2-9 Filing of Proposal:**

No proposal will be considered unless it is filed with the City Secretary's office in the City Hall, Corpus Christi, Texas, within the time limit for receiving proposals as stated in the advertisement. Each proposal shall be in a sealed envelope, plainly marked with the word "PROPOSAL" and the name and description of the project as designated in the "ADVERTISEMENT".

**B-2-10 Withdrawing Proposals:**

Proposals filed with the City Secretary cannot be withdrawn or modified prior to the time set for opening proposals. Request for non-consideration of proposals must be made in writing addressed to the City Engineer and filed with the City Secretary prior to the time set opening proposals. After other proposals are opened and publicly read, the proposal for which withdrawal is properly requested may be returned unopened.

**B-2-11 Cancellation of Bid Opening:**

The City may, at any time, before any bids are actually opened, cancel the opening of the bids and return all bids unopened.

**B-2-12 Opening Proposals:**

The proposals filed with the City Secretary will be opened at the time stated in the advertisement and publicly read aloud and shall thereafter remain on file with the City. No contract will be entered into based upon such proposals until after forty-eight (48) hours shall have elapsed. Proposals not accompanied by the required proposal guaranty will not be read.

**B-2-13 Irregular Proposals:**

Proposals will be considered irregular if they show any omissions, failure to properly account for duly issued addenda, alterations of form, additions, conditions not called for, unauthorized alternate bids or irregularities or qualifications of any kind. However, the City reserves the right to waive any irregularities and to make the award in the best interest of the city.

**B-2-14 Rejection of Proposals:**

The City reserves the right to reject any or all proposals, and all proposals submitted are subject to this reservation. Proposals containing any irregularities or showing an unbalanced value of any items may be rejected. Proposals will be rejected for any of the following specific reasons:

- (a) Proposal received after the time limit for receiving proposals as stated in the advertisement.
- (b) Proposal submitted without the required bid security.
- (c) Proposal submitted and not sealed and/or identifiable to a particular project.

**B-2-15 Disqualification of Bidders:**

Bidders may be disqualified and their proposals not considered for any of the following specific reasons:

- (a) Reason for believing collusion exists among the bidders.
- (b) Reasonable grounds for believing that any bidder is interested in more than one proposal for the work contemplated.
- (c) The bidder being interested in any litigation against the City.
- (d) The bidder being in arrears on any existing contract, having defaulted on previous contracts, or being delinquent in the payment of City taxes.
- (e) Uncompleted work which, in the judgment of the City, will prevent or hinder the prompt completion of additional work if awarded.
- (f) Previous experience investigation reveals poor, incomplete, unacceptable, or inferior work performance and prosecution and lack of fiscal responsibility in paying for services, labor, or products rendered on such previous work.

**B-2-16 Disclosure of Interests:**

All entities desiring to do business with the City of Corpus Christi are required to provide a Disclosure of Interests. The required form is included as a part of the proposal. Prospective bidders may submit the form with their

proposal. The successful bidder shall be required to submit the form within seven (7) calendar days of the receipt of bids. The City also reserves the right to require similar statements from all material suppliers and subcontractors of the successful bidder.

**B-3 AWARD AND EXECUTION OF CONTRACT:**

**B-3-1 Consideration of Contract:**

After proposals are opened, the proposals will be tabulated for comparison on the basis of the bid prices and quantities shown in the proposal. Until final award of the contract, the City reserves the right to reject any or all proposals or proceed to do the work otherwise in the best interest of the City.

**B-3-2 Award of Contract:**

The City reserves the right to withhold the award of the contract for a reasonable period of time from date of opening proposals, and no award will be made until after investigations are made as to the responsibilities of the low bidder. In the City's considering of an award, the bidder may be requested to submit statements regarding previous experience in performing comparable or similar work, his business or technical organization and equipment to help the City evaluate the bidder's abilities. The basis for an award will be determined by the lowest responsible bidder (Article 2368a VATS) deemed most advantageous to the City and not necessarily the lowest bidder. In no case will a contract be awarded until at least forty-eight (48) hours shall have elapsed from the time of opening proposals.

**B-3-3 Equal Opportunity Employer Provisions:**

Every Contractor must agree that during the performance of his contract he will:

- (1) Treat all applicants and employees without discrimination as to race, color, religion, sex, or national origin.
- (2) Identify himself as an equal opportunity employer in all help wanted advertising or requests.

The Contractor is hereby advised that any complaints filed with the City alleging that a Contractor is not an equal opportunity employer during the six months preceding the date of receipt of bids will be referred to the Human Relations Commission through its Human Relations Administrator for the purpose of review and recommendations. The report of the Human Relations Commission will be transmitted to the City Engineer who will include a summary of such report with any future bid award recommendations for which the Contractor is a bidder and bring to the attention of the City Council any such report received prior to the issuance of a work order to any such Contractor. A copy of this report shall be sent to the Contractor. The Human Relations Administrator will follow up any such report and bring to the attention of the Commission any further action by the Contractor which would include that the findings of the Commission should be modified. Any such modified findings of the Commission will be delivered to the City Engineer with a copy to the Contractor and be included in any future bid award recommendations.

The City Council reserves the right to consider such reports in determining the best bid and to terminate, on the basis of such report, any portion of a contract for which a work order has not been issued. However, the Contractor is specifically advised that no equal opportunity employment complaint will be the basis for cancellation of any contract for which a work order has been issued.

**B-3-4 Surety Bonds:**

With the execution and delivery of the contract, the Contractor shall furnish and file with the City, in the amounts herein required, the following surety bonds:

(a) Performance Bond: A good and sufficient bond in an amount equal to one hundred percent (100%) of the approximate total amount of the contract, as evidenced by the proposal tabulation or otherwise, guaranteeing the full and faithful execution of the work and performance of the contract, and for the protection of the City and all other persons against damage by reason of negligence of the Contractor, or improper execution of the work, or the use of inferior materials. This bond shall provide for the repair and maintenance of all defects due to faulty materials, faulty combinations of materials, and/or faulty workmanship that appear within a period of one year from the date of completion and acceptance of the improvement by the City, or such lesser or greater period as may be designated in the Special Provisions. A Performance Bond will not be required if the contract amount does not exceed \$25,000.00.

(b) Payment Bond: A good and sufficient bond in an amount equal to one hundred percent (100%) of the approximate total amount of the contract, as evidenced by the proposal tabulation or otherwise, guaranteeing the full and proper protection of all claimants supplying labor and/or material in the prosecution of the work provided for in said contract and for the use of each such claimant. A Payment Bond will not be required if the contract amount does not exceed \$25,000.00.

(c) Other Bonds: Other bonds, if required in the Special Provisions.

No surety will be accepted by the City who is now in default or delinquent on any bonds or who is interested in any litigation against the City. All bonds shall be issued by an approved surety company authorized to do business in the State of Texas and acceptable to the City, and the surety shall designate an agent who is a resident of Nueces County, Texas. Each bond shall be executed by the Contractor and the surety.

Should any surety on the contract be determined unsatisfactory at any time by the City, notice will be given the Contractor to that effect, and the Contractor shall immediately provide a new surety satisfactory to the City. No payment will be made under the contract until the new surety, or sureties as required, has qualified and been accepted by the City. The contract shall not be operative nor will any payments be due or paid until approval of the bonds has been made by the City.

The City requires that the Power of Attorney submitted with any surety bond (Performance, Payment, etc.) be signed with an original signature and properly dated and sealed. In the event a facsimile Power of Attorney is used, the City must have on file a sworn statement from an officer of the surety company to the effect that the agent who signs the bond form for the surety is currently in good standing with the surety. It is also required that the facsimile be a true copy of the original Power of Attorney on file among the records of the surety in its home office, not be amended or abridge, still be in full force and effect, and that the City will be notified in the event of cancellation of the particular agent.

**B-3-5 Execution of Contract:**

The person or persons, partnership, company, firm, association, corporation, or joint venture to whom a contract is awarded shall, within ten (10) calendar days after such award and after the Contractor has been requested to execute the documents, sign the required contract, furnish the required insurance certificates, and execute the required bonds. No contract shall be binding on the City until it has been attested by the City Secretary, approved as to form by the City Attorney, executed for the City by the City Manager, and delivered to the Contractor.

**B-3-6 Failure to Execute Contract:**

The failure of the bidder to execute the required bonds, furnish the required insurance certificates, and sign the required contract within ten (10) calendar days after the contract is awarded and the Contractor has been requested to execute the documents shall be considered by the City as an abandonment of his proposal, and the City may annul the award. By reason of the uncertainty of the market prices of materials and labor and its being impracticable and difficult to determine accurately the amount of damages accruing the City by reason of the said bidder's failure to execute said bonds and contract within ten (10) calendar days, the proposal guaranty accompanying the proposal shall be the agreed amount of damages which the City will suffer by reason of such failure on part of the bidder and shall thereupon immediately be forfeited to the City. The filing of a proposal will be considered an acceptance of this provision.

**B-4 SCOPE OF WORK:**

**B-4-1 Intent of Plans and Specifications:**

The intent of the plans and specifications is to prescribe a complete work or improvement which the Contractor undertakes to do in full compliance with the plans, specifications, special provisions, proposal, and contract. The Contractor shall do all work as provided in the plans, specifications, special provisions, proposal and contract, and shall do such additional extra work as may be considered necessary to complete the work in a satisfactory and acceptable manner. The Contractor shall furnish all labor, tools, material, machinery, equipment and incidentals necessary for the prosecution of the work.

**B-4-2 Subsidiary Work:**

In the course of furnishing or constructing a complete work or improvement, certain work may be necessary which is subsidiary to the items which are established as pay items. Some such subsidiary work may be shown and specified in detail in the plans and specifications, other work may be less completely shown, and other such work which is entirely necessary for the satisfactory completion of the work as a whole may not be noted on the plans or in the specifications. It shall be the duty of the Contractor to carry out all such subsidiary work as if fully shown, and the cost of such work shall be made subsidiary to the established pay item.

**B-4-3 Increased or Decreased Quantities of Work:**

(a) The City reserves the right to alter the quantities of the work to be performed or to extend or shorten the improvements at any time when and as found necessary, and the Contractor shall perform the work as altered. No allowance will be made for any change in anticipated profits not shall such changes be considered as waiving or invalidating any conditions or provisions of the contract or bonds.

(b) A Major Item as used in this Section shall be construed to be any individual bit item included in the proposal that has a total cost equal to or greater than five percent (5%) of the total contract cost computed on the basis of the proposal quantities and the contract unit prices.

(c) When the quantity of work to be done or of materials to be furnished under any Major Item of the contract is more than one hundred twenty-five (125%) of the quantity of that unit stated in the proposal, then either party to the contract, upon demand, shall be entitled to revised consideration on that portion of the work above one hundred twenty-five percent (125%) of the quantity stated in the proposal.

(d) When the quantity of work done or materials to be furnished under any Major Item of the contract is less than seventy-five percent (75%) of the quantity of that item stated in the proposal, then either party to the contract, upon demand, shall be entitled to revised consideration on the work performed.

(e) Any revised consideration is to be determined by special agreement or as is hereinafter provided under "Payment for Extra Work".

**B-4-4 Alteration of Plans and Specifications:**

The City reserves the right to make such changes in the plans and specifications and in the character of the work as may be necessary or desirable to insure completion in the most satisfactory manner, provided such changes do not materially alter the original plans and specifications or change the general nature of the work as a whole. Such changes shall not be considered as waiving or invalidating any condition or provision of the contract and bonds.

**B-4-5 Value Engineering Incentive Procedures:**

After the award of the contract, the Contractor may develop and submit, to the City Engineer, Value Engineering Change Proposals (VECP's) identifying potential reductions in the contract cost by effective changes to the contract plans and specifications. Any VECP submittal shall include the following:

- (1) The present contract requirement and description of the proposal change including any modifications to the plans and specifications.
- (2) The comparative advantages and disadvantages of both the present requirement and the proposed change.
- (3) An analysis of how the proposed change will alter the function, characteristics and/or performance of a component.
- (4) A separate detailed cost estimate comparing the cost of the existing requirement and the cost of the proposed change including any costs which might be incurred in testing or evaluation of the proposed change.
- (5) A comparative projection of the operational and maintenance costs of the existing requirement and the proposed change.
- (6) A projection of the latest date which the VECP can be incorporated into the contract to achieve maximum cost savings. Any effect upon completion time or delivery schedule should also be noted.

The City Engineer shall notify the Contractor of the status of the VECP within thirty (30) days of its receipt. Acceptance or rejection of the VECP by the City Engineer shall be final. If the VECP is not accepted, written notification will be provided detailing the reasons for rejection. Any VECP may be accepted in whole or in part.

Execution by both parties of a change order to the contract covering the proposed changes shall constitute approval of the VECP and authorization to proceed with the changes. Until such time as the change order is executed, the Contractor shall perform in accordance with the provisions of the existing contract.

The Contractor's share of the savings resulting from approval of the VECP shall be fifty percent (50%) of the net cost savings calculated as follows:

Contractor's Share = .50 (existing contract requirement cost - proposed change costs - testing and evaluation costs incurred by the City or Contractor).

This savings will be reflected on the change order approving the VECP and authorizing the change. Deletion of contract work or construction items and changes initiated by the City will not be considered as VECP's. In those instances, the City will realize 100% of the contract reduction or cost savings.

**B-4-6 Extra Work:**

When additional work not shown in the plans and specifications or reasonably inferred as subsidiary work or as normal adaptation to existing conditions is required, the Contractor shall do such work when ordered in writing by the Engineer. Payment for such extra work will be made as hereinafter provided.

**B-5 CONTROL OF THE WORK AND MATERIALS:**

**B-5-1 Authority of the City Engineer:**

All work shall be performed under the supervision of the City Engineer in a workmanlike manner and to his satisfaction. He shall decide all questions which arise as to the quality and acceptability of materials furnished, work performed, manner of performance, rate of progress of the work, sequence of the construction, interpretation of the plans and specifications, acceptable fulfillment of the contract, compensation, mutual rights between Contractors under these specifications and suspension of the work. He shall determine the amount and quality of the work performed and materials furnished, and his decisions and estimates shall be final. His estimate in such event shall be a condition precedent to the right of the Contractor to receive money due him under the contract.

**B-5-2 Authority and Duty of Engineers or Inspectors:**

The City Engineer may appoint Engineers and/or Inspectors as assistants to inspect all work done and material furnished. Such inspection may extend to all or any part of the work and to the preparation, fabrication or manufacture of the materials to be used. The Engineer or Inspector will not be authorized to revoke, alter, expand, relax, or waive any requirements of the contract documents. The Engineer or Inspector will keep a record of the progress of the work and the manner in which it is being performed and inform the City Engineer of same. He is authorized to call to the attention of the Contractor any deficiency of the work or of materials to conform to the contract documents; however, failure to do so shall not constitute acceptance of said work. The Contractor shall furnish the Engineer with every reasonable facility for ascertaining whether or not the work performed was in accordance with the requirements and intent of the plans and specifications.

The Engineer or Inspector shall in no case act as foreman or supervisor or perform other duties for the Contractor nor interfere with the management of the work by the latter. Any advice which the Engineer or Inspector may give the Contractor shall in no way be construed as binding to the City or release the Contractor from fulfilling all the terms of the contract.

The Engineer or Inspector shall have the authority to reject materials or suspend the work until any questions at issue can be referred to and decided by the City Engineer. If the Contractor refuses to suspend operations on verbal order, the Engineer or Inspector shall issue a written order giving the reason for suspending the work. After delivering the order to the person in charge, the Engineer or Inspector shall immediately leave the job site. Work done during the absence of the Engineer or Inspector under these circumstances will not be accepted or paid for.

**B-5-3 Conformity with Plans:**

All work shall conform to the lines, grades, cross-sections, and dimensions shown on the plans. Any deviation from the plans which may be required by the exigencies of construction will be determined by the City Engineer and authorized by him in writing.

**B-5-4 Existing Structures:**

The plans show the location of all known surface and subsurface structures. However, the location of many gas mains, water mains, conduits, sewers, etc. is

unknown, and the City assumes no responsibility for failure to show any or all of these structures on the plans or to show them in their exact location. It is mutually agreed such failure will not be considered sufficient basis for claims for additional compensation for extra work in any manner whatsoever unless the obstruction encountered is such as to necessitate substantial changes in the lines or grades or requires the building of special work for which no provision is made in the plans and which is not essentially subsidiary to some item of work for which provision is made. It is assumed that, as elsewhere provided, the Contractor has thoroughly inspected the site, is informed as to the correct location of surface structures, has included the cost of such incidental work in the prices bid, and has considered and allowed for all foreseeable incidental work due to variable subsurface conditions, whether such conditions and such work are fully and properly described on the plans or not. Minor changes and variations of the work specified and shown on the plans shall be expected by the Contractor and allowed for as incidental to the satisfactory completion of a whole and functioning work or improvement.

**B-5-5 Coordination of Plans, Specifications, Proposal and Special Provisions:**

The plans, general provisions, proposal, special provisions, standard specifications and all supplemental documents are intended to describe a complete work and are essential parts of the contract. A requirement occurring in any of them is binding. In case of discrepancies, figured dimensions shall govern over scale dimensions; plans shall govern over specifications; special provisions shall govern over both general and standard specifications; and plans and quantities shown on the plans shall govern over those shown in the proposal. The Contractor shall not take advantage of any apparent error or omission in the plans and specifications, and the City Engineer shall be permitted to make such corrections or interpretations as may be deemed necessary for the fulfillment of the intent of the plans and specifications. In the event the Contractor discovers an apparent error or discrepancy, he shall immediately call this to the attention of the Engineer.

**B-5-6 Cooperation of Contractor:**

The Contractor will be supplied with three (3) copies of the plans and specifications. The Contractor shall have available on the work at all times one copy of said plans and specifications. The Contractor shall give to the work the consistent attention necessary to facilitate the progress thereof, and he shall cooperate with the City Engineer, his authorized representatives, and with other contractors in every way possible. The Contractor shall provide a competent superintendent on the work at all times who is fully authorized as his agent on the work. Such superintendent shall be capable of reading and understanding the plans and specifications and shall receive and fulfill instructions from the City Engineer or his authorized representatives. The Contractor shall provide all facilities to enable the Engineer or Inspector to inspect the workmanship and materials entering into the work. On marine work, the Contractor shall furnish motorboat transportation as required by the Engineer for the purpose of inspecting the work. The superintendent shall keep the City Engineer or his representative informed of the work he is planning to do and the work schedule.

**B-5-7 Construction Staking:**

The Engineer will furnish the Contractor with lines, grades, and measurements necessary for the proper prosecution and control of the work contracted for under these specifications. Such stakes or markings as the Engineer may establish either for his own use or the Contractor's guidance shall be preserved by the Contractor until authorized by the Engineer to remove same. Unnecessary destruction of stakes shall not be allowed by the Contractor. The Contractor shall be bound to examine the stakes set and check the lines and grades thus set against the plans and profiles, and shall be accountable particularly that gutters, structures, and pipes which drain in a certain direction on the plans do so drain when constructed.



**B-5-8 Source of Supply of Materials:**

The materials shall be the best procurable as required by the plans, specifications, and special provisions. The Contractor shall not start delivery of materials until the Engineer has approved the source of supply. Only material conforming to these specifications shall be used, only after written approval has been given by the Engineer, and only so long as the quality of said materials remains equal to the requirements of the specifications. The Contractor shall furnish approved materials from other sources if for any reason the product from any source at any time before commencement or during the prosecution of the work proves unacceptable. After approval, any material which has become mixed with or coated with dirt or any other foreign substances during its delivery and handling will not be permitted to be used in the work. New material is required unless otherwise specially provided in the plans and specifications.

**B-5-9 Samples and Tests of Materials:**

Where, in the opinion of the Engineer or as called for in the specifications, tests of material are necessary, such tests will be made at the expense of the City unless otherwise provided. The failure of the City to make any tests of materials shall in no way relieve the Contractor of his responsibility of furnishing materials conforming to the specifications. Tests, unless otherwise specified, will be made in accordance with the latest methods of the American Society for Testing Materials. The Contractor shall provide such facilities as the Engineer may require for collecting and forwarding samples and shall not use the materials represented by the samples until tests have been made. The Contractor shall furnish adequate samples without charge.

**B-5-10 "Or Equal" Clause:**

All bids shall be based on the specified products. Where two or more products are specified for an item of work, either one thereof is acceptable and the choice is left to the Contractor. Where only one product is specified, and where the term "or approved equal" or similar wording is used in connection with specified products, the Contractor may, if he so desires, offer for consideration a substitute product which he judges to be equal in every respect to the required product. When a specific process is specified as well as a guarantee of the results, the Contractor shall, if in his judgement the process may not produce the required result, offer for approval an alternative process which he would guarantee. All such offers shall be made in writing to the Engineer after award of contract.

The Contractor shall furnish to the Engineer with the first submittal sufficient drawings, specifications, samples, performance data, and other information necessary to assist the Engineer in determining whether the proposed substitution is acceptable. The burden of proof shall be upon the Contractor. No consideration will be given to incomplete submittals. Substitutions must be approved in writing before they may be used.

**B-5-11 Storage of Materials:**

Materials shall be stored so as to insure the preservation of their quality and fitness for the work. When directed by the Engineer, they shall be placed on wooden platforms or other hard, clean surfaces and not on the ground, and shall be placed under cover when directed. Stored materials shall be placed and located so as to facilitate prompt inspection. Particular attention is directed to the storage of structural steel and reinforcing steel, which shall not be stored on the ground.

**B-5-12 Removal of Defective and Unauthorized Work:**

All work which has been rejected or condemned shall be repaired, or if it cannot be repaired satisfactorily, it shall be removed and replaced at the Contractor's expense. Defective materials shall be immediately removed from the site of the work. Work done without line and grade having been given, work done

beyond the lines or not in conformity with the grades shown on the plans or as given, save as herein provided, work done without proper inspection, or any extra or unclassified work done without written authority and prior agreement in writing as to prices shall be done at the Contractor's risk and will be considered unauthorized and, at the option of the Engineer, may not be measured and paid for and may be ordered removed at the Contractor's expense. Upon failure of the Contractor to repair satisfactorily or to remove and replace rejected, unauthorized, or condemned work or materials immediately after receiving notice from the Engineer, the Engineer will, after giving written notice to the Contractor, have the authority to cause defective work to be remedied or removed and replaced or to cause unauthorized work to be removed, and to deduct the cost thereof from any monies due or to become due the Contractor.

**B-5-13 Final Inspection:**

The Engineer will make final inspection of all work included in the contract as soon as practicable after the work is completed and ready for acceptance. If the work is not acceptable to the Engineer at the time of such inspection, he will inform the Contractor as to the particular defects to be remedied before final acceptance will be made. Previous inspection by the Engineer or his representatives during the course of the work shall not be interpreted as approval or acceptance of work or materials which on final inspection are found to be defective or note in accordance with the contract and its duly authorized modifications.

**B-5-14 Warranty Inspection:**

Forty-five (45) to sixty (60) days prior to the expiration of the maintenance guaranty period as specified in the contract documents, a warranty inspection will be made. The Contractor may be notified when this examination will be made so that he or his representatives may be present.

Within the maintenance guaranty period, the Contractor when ordered by the Engineer, shall repair, replace or rebuild such portions which are found to be faulty because of materials or workmanship. The Contractor shall begin the remedial work within ten (10) calendar days of written order by the Engineer. In case the Contractor does not start remedial work within the above time limit, or in case of an emergency condition caused by faulty work, the City may take remedial action and charge the cost thereof against the Contractor and/or his surety.

**B-6 LEGAL RELATIONS AND PUBLIC RESPONSIBILITY:**

**B-6-1 Laws to be Observed:**

The Contractor shall at all times observe and comply with all Federal and State Laws and City ordinances and regulations which in any manner affect the conduct of the work and shall observe and comply with all orders, laws, ordinances and regulations which exist or which may be enacted later by bodies having jurisdiction or authority for such enactment. No pleas of misunderstanding or ignorance thereof will be considered. The Contractor and his surety shall indemnify and save harmless the City and all its officials, agents, and employees against any claims or liability arising from or based on the violation of any such law, ordinance, regulation or order, whether by himself or his employees.

**B-6-2 Permits and Licenses:**

The Contractor shall procure all legally required building, plumbing, electrical and other permits and licenses, pay all charges and fees (except City fees), give all notices necessary and incidental to the due and lawful prosecution of the work, and arrange for all building, plumbing, electrical or other inspections as appropriate.

**B-6-3 Patented Devices, Materials and Processes:**

If the Contractor is required or desires to use any design, device, material or process covered by letters, patent or copyright, he shall provide for such use by suitable legal agreement with the patentee or owner. It is mutually agreed and understood that, without exception, contract prices shall include all royalties or costs arising from patents, trademarks and copyrights in any way involved in the work. The Contractor and his sureties shall indemnify and save harmless the City from any and all claims for infringement by reason of the use of any such patented design, device, material or process or any trademark or copyright in connection with the work agreed to be performed under this contract and shall indemnify the City for any cost, expense, or damage which it may be obliged to pay by reason of such infringement at any time during the prosecution of the work or after completion of the work.

**B-6-4 Sanitary Provisions:**

The Contractor shall establish and enforce among his employees such regulations in regard to cleanliness and disposal of garbage and waste as will tend to prevent the inception and spread of infection or contagious diseases and to prevent effectively the creation of a nuisance about the work or any property either public or private, and such regulations as are required by the Engineer shall be put into immediate force and effect by the Contractor. The necessary sanitary conveniences for the use of laborers on the work, properly secluded from public observation, shall be constructed and maintained by the Contractor in such manner and at such points as will be approved by the Engineer, and their use shall be strictly enforced by the Contractor. All sanitary laws and regulations of the State of Texas and the City of Corpus Christi shall be strictly complied with.

**B-6-5 Public Convenience and Safety:**

Materials stored about the work shall be so placed and the work shall at all times be so conducted as to cause no greater obstruction to the traveling public than is considered necessary by the Engineer. The Contractor shall, upon direction of the Engineer, make provisions by bridges or otherwise at sidewalks and private driveways for the free passage of pedestrians and vehicles provided that, where bridging is impracticable or unnecessary in the opinion of the Engineer, the Contractor may make arrangements satisfactory to the Engineer for the diversion of traffic and shall, at his own expense, provide all material and perform all work necessary for the construction and maintenance of roadways and bridges. Sidewalks must not be obstructed except by special permission of the Engineer. The materials excavated and the construction materials or plant used in the construction of the work shall be placed so as not to endanger the work or prevent free access to all fire hydrants, water valves, gas valves, manholes for telephone, telegraph, signal or electric conduits, sanitary or storm sewers, and fire alarm or police call boxes in the vicinity.

The City reserves the right to remedy any neglect on the part of the Contractor as regards the public convenience and safety which may come to its attention after twenty-four hours notice in writing to the Contractor except in case of emergency when it shall have the right to remedy any neglect without notice, and in either case, the cost of such work done by the City shall be deducted from monies due or to become due the Contractor. The Contractor shall notify the Fire and Police Division Headquarters when any street is closed or obstructed. Where the Contractor is required to construct temporary bridges or make other arrangements for crossings over ditches or streams, his responsibility for accidents shall include the roadway approaches as well as the structures of such crossings. The Contractor shall mark all detours as directed by the Engineer so that the entire route of the detour is designated, such markings to be by neat and workmanlike signs large enough and so painted and so placed as to be clearly visible.

**B-6-6 Privileges of Contractor in Streets, Alleys and Right-of-Way:**

For the performance of the contract, the Contractor will be permitted to occupy such portions of streets or alleys, or other public places or other right-of-way, as provided for in the ordinances of the City, as shown on the plans or as permitted by the Engineer. A reasonable amount of tools, materials and equipment for construction purposes may be stored in such space but not more than is necessary to avoid delay in the construction. Excavation and waste materials shall be piled or stacked in such a way as not to interfere with spaces that may be designated to be left free and unobstructed. Other Contractors of the City may, for all purposes be required by their contracts, enter upon the work and premises used by the Contractor, and the Contractor shall give to other contractors of the City all reasonable facilities and assistance for the completion of adjoining work. Any additional grounds desired by the Contractor for his use shall be provided by him at his own cost and expense.

**B-6-7 Railway Crossings:**

Where the work encroaches upon any right-of-way of any railway, the City will secure the necessary easement for the work. Where railway tracks are to be crossed, the Contractor shall observe all the regulations and instructions of the railway company as to methods of doing the work or precautions for safety of property and the public. All negotiations with the railway company, except for right-of-way, shall be made by the Contractor. The railway company shall be notified by the Contractor not less than five (5) days previous to time of his intentions to begin the work. The Contractor will not be paid direct compensation for such railway crossing but shall receive only the compensation for such railway crossing as set out in the proposal.

**B-6-8 Traffic Control Devices:**

Where the Contractor's operations are carried on in or adjacent to any public right-of-way or public place and which, in the opinion of the City Engineer, interferes with normal vehicular and pedestrian traffic, the Contractor shall take appropriate measures to protect persons, property and the work. Such measures shall include but not be limited to barricades, lights, signs, fences, flagmen, and watchmen. Such measures shall be taken to exclude or route pedestrian and vehicular traffic around the work and area of operations. Barricades, lights, signs and flagmen shall be utilized in accordance with the Uniform Barricading Standards and Practices as adopted by the City.

The Contractor shall be responsible for all damages to persons, property and the work occasioned by his operations and said responsibility shall not cease until the project has been accepted by the City.

**B-6-9 Use of Explosives:**

Should the Contractor elect to use explosives in the prosecution of the work, the utmost care shall be exercised so as not to endanger life or property. The City shall not be held liable for damages done by the Contractor in the use of explosives. The Contractor shall notify the proper representatives of any public service corporation, any company or any individual not less than eight (8) hours in advance of the use of explosives which might damage or endanger their or his property along or adjacent to the work. Wherever explosives are stored or kept, they shall be stored in a safe and secure manner, and all storage places shall be plainly marked "DANGEROUS EXPLOSIVES" and shall be under the care of a competent watchmen at all times.

**B-6-10 Protection and Restoration of Property:**

Where the work passes over or through private property, the City will provide such right-of-way. The Contractor shall not enter upon private property for any purpose without having previously obtained permission from the owner. The Contractor shall be responsible for the preservation of and shall use every precaution to prevent damage to all trees, shrubbery, plants, lawns, fences,

culverts, bridges, pavements, driveways, sidewalks, etc., to all water, sewer and gas lines; to all conduits, to all overhead pole lines, or appurtenances thereof; and to all other public and private property along or adjacent to the work. The Contractor shall be responsible for all damage or injury to the property of any character resulting from any act, omission, neglect or misconduct in the execution of the work or in consequence of the non-execution thereof on the part of the Contractor, he shall restore or have restored at his own cost and expense such property to a condition similar to equal to that existing before such damage or injury was done by repairing, rebuilding or otherwise restoring as may be directed, or he shall make good such damage from injury in a manner acceptable to the owner or the Engineer. In case of failure on the part of the Contractor to restore such property or to make good such damage or injury, the Engineer may, after forty-eight (48) hours written notice under ordinary circumstances, and without notice when a nuisance or hazardous condition results, proceed to repair, rebuild or otherwise restore such property as may be determined necessary, and the cost thereof will be deducted from any monies due or to become due the contractor under his contract.

**B-6-11 Responsibility for Damage Claims:**

The Contractor shall not commence work under this contract until he has obtained all insurance required herein and such insurance has been approved by the City. The Contractor shall not allow any subcontractor(s) to commence work until all similar insurance required of the subcontractor(s) has been so obtained.

Within ten (10) calendar days after the date the City requests that the Contractor sign the contract documents, the Contractor shall furnish the City with certificates of insurance evidencing that the Contractor has obtained insurance coverage of the types more particularly described below in parts (a) through (e) of this section. (For self-insured workers' compensation coverage, other documents, specified hereafter, may be substituted for the certificate of insurance just described). The workers' compensation insurance policy need not list the City as an additional insured. Additionally, all certificates of insurance shall state the name of the project in the "Description of Operations" section of such certificate. These certificates and any subsequent insurance certificates in connection with this particular contract shall be delivered to the offices of the City Engineer. The Certificates of Insurance shall state that ten (10) days written notice will be given the City before any policy covered thereby is changed or canceled and shall show the following minimum coverage in an insurance company acceptable to the City. The City reserves the right to modify minimum limits based upon the nature and scope of the work. The Contractor agrees to comply with the Supplemental Insurance Requirements stated in the "Special Provisions" section of this contract.

(a) General Liability, including Commercial General Form; Premises - Operations; Explosion & Collapse Hazard; Underground Hazard; Products/Completed Operations Hazard; Contractual Insurance, with an endorsement on the face of the certificate that it includes the "Hold Harmless" in the last paragraph of this provision; Broad Form Property Damage; Independent Contractors; and Personal Injury:

MINIMUM INSURANCE COVERAGE

Bodily Injury and Consequent Death . . . . .	\$300,000 Per Person
Bodily Injury and Consequent Death . . . . .	\$500,000 Each Occurrence
Property Damage . . . . .	\$100,000 Each Occurrence

(b) Automobile Liability - Owned, Nonowner or Rented:

MINIMUM INSURANCE COVERAGE

Bodily Injury and Consequent Death . . . . .	\$100,000 Per Person
Bodily Injury and Consequent Death . . . . .	\$300,000 Each Occurrence
Property Damage . . . . .	\$100,000 Each Occurrence

(c) Workers' Compensation and Occupational Diseases:

The Contractor shall obtain worker's compensation insurance coverage through a licensed insurance company or through self-insurance obtained in accordance with Texas law. If such coverage is obtained through a licensed insurance company, then the contract for coverage shall be written on a policy and endorsements approved by the Texas State Board of Insurance.

If such coverage is provided through self-insurance, then within ten (10) calendar days after the date the City requests that the Contractor sign the contract documents, the Contractor shall provide the City with a copy of its certificate of authority to self-insure its workers' compensation coverage as well as a letter, signed by the Contractor, stating that the certificate of authority to self-insure remains in effect and is not the subject of any revocation proceeding then pending before the Texas Workers' Compensation Commission. Further, if at any time before final acceptance of the Work by the City, such certificate of authority to self-insure is revoked or is made the subject of any proceeding which could result in revocation of the certificate, then the Contractor shall immediately provide written notice of such facts to the City, by certified mail, return receipt requested directed to: City of Corpus Christi, Department of Engineering Services, P.O. Box 9277, Corpus Christi, Texas 78469 - Attention: Contract Administrator.

Whether workers' compensation insurance coverage is provided through a licensed insurance company or through self-insurance, the coverage provided must be in an amount sufficient to assure that all worker' compensation obligations incurred by the Contractor will be promptly met.

(d) Employer's Liability:

Minimum Insurance Coverage - \$100,000 Per Person

(e) Builder's Risk Insurance Coverage:

Contractor will be responsible for providing builder's risk insurance coverage for the term of the contract up to and including the date the City finally accepts the project or work. Builder's risk coverage shall be an "All Risk" form. The policy shall be a completed value form. The Contractor shall provide such builder's risk coverage as indicated in the Special Provisions, which is estimated to be the value at completion of the real or personal property to be constructed, repaired or otherwise improved under the contract.

Contractor shall be responsible for paying all costs necessary to procure such builder's risk insurance coverage, including any deductible. The City shall be named an additional insured on any policies providing such insurance coverage.

In the event of accidents of any kind, the Contractor shall furnish the City with copies of all reports such accidents at the same time that the reports are forwarded to any other interested parties. It shall be the Contractor's primary responsibility for immediately notifying the carriers of any or all insurance under this contract in the event of a known loss or claim presented to the Contractor by the City or a third party.

Contractor agrees to indemnify, save harmless and defend the City, its agents, servants, and employees, and each of them against and hold it and them harmless from any and all lawsuits, claims, demands, liabilities, losses and expenses, including court costs and attorneys' fees, for or on account of any injury to any person, or any death at any time resulting from such injury, or any damage to any property, which may arise or which may be alleged to have arisen out of or in connection with the work covered by this contract. The foregoing indemnity shall apply except if such injury, death or damage is caused directly by the negligence or other fault of the City, its agents, servants, or employees or any other person indemnified hereunder.

**B-6-12 Contractor's Claim for Damages:**

Should the Contractor claim compensation for any alleged damage by reason of the acts or omissions of the City, he shall, within three (3) days after sustaining such alleged damage, make a written statement to the City Engineer, setting out in detail the nature of the alleged damage; and on or before the twenty-fifth (25th) day of the month succeeding that in which any such damage is claimed to have been sustained, the Contractor shall file with the City Engineer an itemized statement of the details and amount of such alleged damage and, upon request, shall give the City Engineer access to all books of accounts, receipts, vouchers, bills of lading and other books or papers containing any evidence as to the amount or such alleged damage. Unless such statements shall be filed as hereinabove required, the Contractor's claim for compensation shall be waived and he shall not be entitled to payment on account of such damage.

**B-6-13 Public Utilities and Other Property to be Changed:**

In case it is necessary to change or move, the property shall not be moved or interfered with until ordered to do so by the Engineer, unless the plans or specifications show that such work is to be done by the Contractor. The right is reserved to the owner of public utilities to enter upon the limits of the contract for the purpose of making such changes or repairs of their property that may be necessary by performance of the contract. The City reserves the right of entering upon the limits of the contract for the purpose of repairing or relaying sewer, gas and water lines and appurtenances, repairing structures, etc., and making other repairs, changes or extensions to any City property.

**B-6-14 Temporary Sewer and Drain Connections:**

When existing sewers have to be taken up or removed, the Contractor shall, at his cost and expense, provide and maintain temporary outlets and connections for all private or public drains or sewers. The Contractor shall also take care of all sewage and drainage which will be received from these drains and sewers; and for this purpose, he shall provide and maintain, at his own expense, adequate pumping facilities and temporary outlets or diversions. The contractor, at his own expense, shall construct such troughs, pipes or other structures necessary and be prepared at all times to dispose of drainage and sewage received from these temporary connections until such time as the permanent connections are built and in service. The existing sewers and connections shall be kept in service and maintained under the contract except where specified or ordered to be abandoned by the Engineer. All water or sewage shall be disposed of in a satisfactory manner so that no nuisance is created and so that the work under construction will adequately be protected.

**B-6-15 Arrangement and Charge for Water Furnished by the City:**

Where the Contractor desires to use City water in connection with any construction work, he shall make complete and satisfactory arrangements with the City of Corpus Christi, Department of Public Utilities for so doing. However, this in no way obligates the City to provide water.

**B-6-16 Use of Fire Hydrants:**

No person shall open, turn off, interfere with, attach any pipe or hose to, or connect anything with any fire hydrant, stop valve or stop cock, or tap and water main belonging to the City unless duly authorized to do so by the City of Corpus Christi, Water Division Superintendent.

**B-6-17 Use of a Section or Portion of the Work:**

Wherever, in the opinion of the Engineer, any section or portion of the work or any structure is in suitable condition, it may be put into use upon the written order of the Engineer, and such usage shall not be held to be in any way an acceptance of said work or structure or any part thereof or as a waiver of any of the provisions of these specifications or the contract pending final

completion and acceptance of the work; all necessary repairs and removals of any section of the work so put into use, due to defective materials or workmanship or to operations of the Contractor, shall be performed by the Contractor at his own cost and expense.

**B-6-18 Separate Contracts:**

The City reserves the right to make essential installation of items not included in the contract prior to acceptance of the project from the Contractor. Within this right, the City may let other contracts or may do such work with its own materials and labor forces. The City, in reserving this right, warrants that it will cooperate with the Contractor's forces and goals. The Contractor shall not commit or permit any act which will interfere with the performance of work by any other contractor or company or by City employees. The Contractor shall cooperate to the end that the City may realize a complete functioning of the project on the date of Final Acceptance.

**B-6-19 Contractor's Responsibility for the Work:**

Until written acceptance by the Engineer, as provided for in these specifications, the work shall be under the charge and care of the Contractor, and he shall take every necessary precaution to prevent injury or damage to the work or any part thereof by action of the elements or from any other cause whatsoever, whether arising from the execution or non-execution of the work. The Contractor shall rebuild, repair, restore and make good, at his own cost and expense, all injuries or damages to any portion of the work occasioned by any of the hereinabove causes.

**B-6-20 No Waiver of Legal Right:**

Inspection by the Engineer, any order, measurement, quantity or certificate by the Engineer; any order by the City for payment of money; any payment for or acceptance of any work; or any extension of time; or any possession taken by the City shall not operate as a waiver of any provisions of the contract or any power therein reserved to the City of any rights or damages therein provided. Any waiver of any breach of contract shall not be held to be waiver of any other or subsequent breach. The City reserves the right to correct any error that may be discovered in any estimate that may have been paid and to adjust the same to meet the requirements of the contract and specifications. The City reserves the right to claim and recover by process of law sums as may be sufficient to correct any error or make good any deficiency in the work resulting from such error, dishonesty or collusion, upon the conclusive proof of collusion or dishonesty by the Contractor or his agents and the Engineer or his assistants, discovered in the work after the final payment has been made.

**B-6-21 Indemnification and Hold Harmless:**

The contractor shall hold the City, its officials, employees, attorneys, and agents harmless and shall indemnify the City, its officials, employees, attorneys, and agents from any and all damages, injury, or liability whatsoever from an act or omission of the Contractor, or any subcontractor, supplier, materialman, or their officials, employees, agents, or consultants, or any work done under the contract or in connection therewith by the Contractor, or any subcontractor, supplier, materialman, or their officials, employees, agents, or consultants, or the operations or activities of the Contractor or any subcontractor, supplier, materialman, or their officials, employees, agents, or consultants.

**B-6-22 Tax Exemption Provision:**

Contracts awarded by the City of Corpus Christi qualify for exemption pursuant to the provision of Article 20.04 (H) of the Texas Limited Sales, Excise and Use Tax Act.



The Contractor performing this contract may purchase, rent or lease all materials, supplies, equipment used or consumed in the performance of this contract by issuing to his supplier an exemption certificate in lieu of the tax, said exemption certificate complying with State Comptroller's Ruling #95-0.07. Any such exemption certificate issued by the contractor in lieu of the tax shall be subject to the provisions of the State Comptroller's Ruling #95-0.09 as amended to be effective October 2, 1968.

**B-7 PROSECUTION AND PROGRESS:**

**B-7-1 Subletting the Work:**

The Contractor shall perform with his own organization and with the assistance of workmen under his immediate superintendence, work of a value not less than fifty percent (50%) of the value of all work embraced in the contract exclusive of items not commonly found in contracts for similar work or which require highly-specialized knowledge, craftsmanship and/or equipment not ordinarily available in the organizations of Contractors performing work of the character embraced in the contract. No portion of the work covered by these specifications and contract, except contracts for purchase and delivery of materials, shall be sublet without written permission of the City. If the Contractor sublets any part of the work to be done under his contract, he will not, under any circumstances, be relieved of his responsibility and obligations. All transactions of the Engineer will be with the Contractor. Subcontractors will be considered only in the capacity of employees and/or workmen and shall be subject to the same requirements as to character, competency, wages and hours. The City will not recognize any subcontractor on the work. The Contractor shall, at all times when the work is in operation, be represented either in person or by a qualified superintendent or other designated representative.

**B-7-2 Assignment of Contract:**

The Contractor shall not assign, transfer, convey or otherwise dispose of the contract or his right, title or interest in or to the same, or any part thereof, without the previous consent of the City Council and concurred in by the sureties. If the Contractor does without such previous consent assign, transfer, convey or otherwise dispose of the contract or of his rights, title or interest therein, or any part thereof to any persons, partnership, company, firm or corporation, or by bankruptcy, voluntary or involuntary, or by assignment under the insolvency laws of any state, attempt to dispose of the contract or make default in or abandon said contract, then the contract may, at the option of the City, be revoked or annulled, unless the sureties shall successfully complete said contract; and any monies due or to become due under said contract shall be retained by the City as liquidated damages for the reason that it would be impracticable and extremely difficult to fix the actual damages.

**B-7-3 Prosecution of the Work:**

Prior to beginning construction operations, the Contractor shall submit to the Engineer a chart or brief of his work schedule outlining the manner and sequence of prosecution of the work that he intends to follow in order to complete the contract within the allotted time. Whenever, during the course of the work, this planned sequence and/or method must be revised, such revision shall be submitted in writing to the Engineer.

The Contractor shall begin the work to be performed under this contract within the time limit stated in the Agreement and shall conduct the work in such a manner and with sufficient equipment, materials and labor as is necessary to insure its completion within the time limit. The sequence of all construction operations shall be at all times as directed be or approver by the Engineer. Such direction or approval by the Engineer shall not relieve the Contractor from the full responsibility of the complete performance of the contract. Should the prosecution of the work be discontinued by the Contractor, he shall notify the Engineer at least twenty-four (24) hours in advance of resuming operations.

**B-7-4 Limitation of Operations:**

The work shall be so conducted as to create a minimum amount of inconvenience to the public. At any time when, in the judgment of the Engineer, the Contractor has obstructed or closes or is carrying on operations on a greater portion of the street or public way than is necessary for the proper execution of the work, the Engineer may require the Contractor to finish the sections on which work is in progress before operations are started on any additional section.

**B-7-5 Character of Workmen and Equipment:**

Local labor shall be used by the Contractor if available. The Contractor may bring in from outside the City his key employees and superintendent. All other employees, including equipment operators, may be imported only after the local supply is exhausted.

The Contractor shall employ such superintendents, foremen, and workmen as are careful and competent and the Engineer may demand the dismissal of any person or persons employed by the Contractor in, about or on the work who shall misconduct himself or be incompetent or negligent in the proper performance of his or their duties or neglect or refuse to comply with the directions of the Engineer, and such person or persons shall not be employed thereon again without the written consent of the Engineer. All workmen shall have sufficient skill and experience to perform properly the work assigned them. The Contractor shall furnish such equipment as is considered necessary for the prosecution of the work in an acceptable manner and at a satisfactory rate of progress. All equipment, tools and machinery used for handling materials and executing any part of the work shall be subject to the approval of the Engineer and shall be maintained in a satisfactory working condition. Equipment on any portion of the work shall be such that no injury to the work or adjacent property will result from its use.

**B-7-6 Working Hours:**

Work shall be done only during the regular and commonly accepted and prescribed working hours. No work on any unit of this contract shall be performed before 7 a.m., or after 6 p.m., or on Sunday, or on a regular holiday as listed in the definitions, unless special permission is given in writing by the Engineer. Excepted from the preceding shall be the setting of flashers, maintenance of barricades, wetting of concrete curing mats, and such measures as the Contractor must take to protect life and property, as are of an emergency nature and not merely extensions of the regular working day. Attention is directed to the definition for contract time.

**B-7-7 Time of Commencement and Completion:**

The Contractor shall commence the work within the time specified, and the rate of progress shall be such that the whole work will be performed and the premises cleaned up in accordance with the contract, plans and specifications within the time limit specified in the contract unless an extension of time be made in the manner hereinafter specified.

**B-7-8 Extension of Time of Completion:**

The Contractor shall be entitled to an extension of time as provided herein only when claim for such extension is submitted to the City in writing by the Contractor within seven (7) days from and after the time when any alleged cause of delay shall occur, and then only when such claim is approved by the City. In adjusting the contract time for the completion of the project, unforeseeable cause beyond the control and without the fault or negligence of the Contractor, including but not restricted to inability to obtain supplies and materials, acts of God, or the public enemy, acts of the owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, unusually severe weather conditions (weather which is beyond the normal weather recorded and expected for the season or seasons of the year in the records of the National Oceanic and Atmospheric Administration's Climatic Data Center), or delays of subcontractors

due to such causes; all provided that actual stoppage of work ensues and no fault of the Contractor is involved.

If the satisfactory execution and completion of the contract should require work and materials in a greater amount, or quantities, than those set forth in the contract, then the contract time shall automatically be increased the same proportion as the cost of the additional work bears to the cost of the original work contracted for. No allowance will be made for delays or suspension of the prosecution of the work due to the fault of the Contractor.

**B-7-9 Computation of Contract Time for Completion:**

For the purpose of computation, the contract time shall begin with the tenth (10th) calendar day after the date of the written authorization by the City Engineer to begin work, or such earlier date as work, other than the delivery of materials, is actually commenced.

The Engineer shall furnish the Contractor a monthly statement showing the days (calendar or working) charged during the month. If no protest as to the correctness of the statement is filed within seven (7) days by the Contractor, the statement will stand.

Contract time shall be charged as described under the definition thereof.

**B-7-10 Failure to Complete on Time:**

The time of completion is the essence of the contract. For each day (calendar or working) that any work shall remain uncompleted after the time specified in the time specified in the proposal and contract, or the increased time granted by the City, or as automatically increased by additional work or materials ordered after the contract is signed, a sum per day will be deducted from the monies due the Contractor, not as a penalty but as liquidated damages. This sum of liquidated damages per day will be as shown in the special provisions, proposal or elsewhere in the contract documents.

The sum of money thus deducted for such delay, or noncompletion is not to be considered as a penalty but shall be deemed, taken and treated as reasonable liquidated damages since it would be impracticable and extremely difficult to fix the actual damages, with such sums of money to be deducted from Contractor's monies at the time or times such damages begin to occur, thence to the completion of construction.

**B-7-11 Suspension by Court Order:**

The Contractor shall suspend such part or parts of the work ordered by the Court, and will not be entitled to additional compensation by virtue of such Court Order. Neither will he be liable to the City in the event and for the time the work is suspended by Court Order.

**B-7-12 Temporary Suspension:**

The Engineer shall have the authority to suspend the work wholly or in part for such period or periods as he may deem necessary due to unsuitable weather conditions as are considered unfavorable for the suitable prosecution of the work. If it should become necessary to stop work for an indefinite period, the Contractor shall store all materials in such manner that they will not obstruct or impede the public unnecessarily or become damaged in any way, and he shall take every precaution to prevent damage or deterioration of the work performed; he shall provide suitable drainage about the work and erect temporary structures where necessary. The Contractor shall not suspend work without written authority from the Engineer and shall proceed with work promptly when notified by the Engineer to resume operations.

**B-7-13 Suspension of Work and Annulment of Contract:**

The work or any portion of the work under contract shall be suspended immediately on written order of the City Engineer or the City Manager, a copy of such notice to be served on the contractor's sureties, or the contract may be annulled by the City for any good cause or causes, among others of which special reference is made to the following:

- (a) Failure of the Contractor to start the work within the specified number of calendar days from the date of written notice by the City to begin the work.
- (b) Substantial evidence that the progress of the work being made by the Contractor is insufficient to complete the work within the specified time.
- (c) Failure of the Contractor to provide sufficient and proper equipment for properly executing the work.
- (d) Substantial evidence that the Contractor has abandoned the work.
- (e) Substantial evidence that the Contractor has become insolvent or bankrupt, or otherwise financially unable to carry on the work.
- (f) Deliberate failure on the part of the Contractor to observe any requirements of these specifications or to comply with any orders given by the Engineer as provided for in these specifications.
- (g) Failure of the Contractor to promptly make good any defects in materials or workmanship, or any defects of any nature, the correction of which has been directed in writing by the Engineer.
- (h) Substantial evidence of collusion for the purpose of illegally procuring a contract or perpetrating fraud on the City in the construction of the work under contract.

When the work is suspended for any of the causes itemized above or for any other cause or causes, the Contractor shall discontinue the work or such part thereof as the City shall designate, whereupon the sureties may, at their option, assume the contract or that portion thereof which the City has ordered the Contractor to discontinue, and may perform the same, or may, with the written consent of the City, sublet the work or that portion of the work so taken over, provided however that the sureties shall exercise their option, if at all, within two (2) weeks after the written notice to discontinue the work has been served upon the Contractor and upon the sureties or their authorized agents. The sureties in such event shall assume the Contractor's place in all respects, and shall be paid by the City for all work performed by them in accordance with the terms of the contract. All monies remaining due the Contractor at the time of his default shall thereupon become due and payable to the sureties as the work progresses, subject to all the terms of the contract. In case the sureties do not, within the hereinabove specified time, exercise their right and option to assume the contract or that portion thereof which the City has ordered the Contractor to discontinue, then the City shall have the power to complete by contract or otherwise as it may deem necessary; and the Contractor hereto agrees that the City shall have the right to take possession of and use any of the materials, plant, tools, equipment, supplies and property of every kind provided by the Contractor for the purpose of his work and to procure other tools, equipment and materials for the completion of the same, and to charge to the account of the Contractor the expenses of said contract or labor, materials, tools, equipment and expenses incidental thereto. The expense so charged shall be deducted by the City out of such monies as may be due or may at any time thereafter become due the Contractor under and by virtue of the contract or any part thereof. The City shall not be required to obtain the lowest bid for the work of completing the contract, but the expenses to be deducted shall be the actual cost of such work. In case such expense is less than the sum which would

have been payable under the contract if the same had been completed by the Contractor, then in such case, the City may pay to the Contractor the difference in cost provided that the Contractor shall not be entitled to any claim for damages or for loss of anticipated profits; in case such expense shall exceed the amount which would have been payable under the contract if the same had been completed by the Contractor, then the Contractor and his sureties shall pay the amount of such excess to the City on notice from the City of the excess due. When any particular part of the work is being carried on by the City by contract or otherwise under the provisions of this section, the Contractor shall continue the remainder of the work in conformity with the terms of the contract, and in such manner as not to hinder or interfere with the performance of workmen employed as above provided by the City.

**B-7-14 Termination of Contract:**

The contract will be considered fulfilled, saved as provided in any maintenance stipulations, bond or by law, when all the work has been completed, the final inspection made by the Engineer, and final acceptance and final payment made by the City.

**B-8 MEASUREMENT AND PAYMENT:**

**B-8-1 Measurement of Quantities:**

The determination of quantities of work acceptably completed under the terms of the contract, or as directed by the Engineer in writing, will be made by the Engineer, based on measurements made by the Engineer. These measurements will be taken according to the U.S. Standard Measurements, used in common practice, and will be the actual length, area, solid contents, numbers and weight. It is pointed out that inclusion in the standard construction specifications of paragraphs describing methods of measurement and payment is not intended to imply that separate payments shall be made under each such standard specification. The units for which payment shall be made are those stated in the proposal.

**B-8-2 Unit Price:**

Where in the proposal form a "Unit Price" is set forth, the "Unit Price" shall include the furnishing by the Contractor of all labor, tools, materials, machinery, appliances, plant and equipment appurtenant to and necessary for construction in every detail and the completion in a first class, workmanlike manner of all the work to be done under these specifications. The "Unit Price" shall also include all permanent protection of overhead, surface and underground structures, cleaning up, finish, overhead expense, bond, insurance, patent fees, royalties, risk due to the elements, delay, profit, injuries, damages, claims and all other items not specifically mentioned that may be required to construct fully each item of the work complete in place.

**B-8-3 Scope of Payment:**

The Contractor shall receive and accept the compensation, as herein provided, in full payment for furnishing all labor, tools, materials, equipment and incidentals; for performing all work contemplated and embraced under the contract; for all loss or damage arising out of the nature of the work or from the action of the elements; for any unforeseen defects or obstructions which may arise or be encountered during the prosecution of the work and before its final acceptance by the Engineer; for all risks of whatever description connected with the prosecution of the work; for all expense incurred by or in consequence of suspension or discontinuance of such prosecution of the work as herein specified; for any infringement of patents, trademarks or copyrights; and for completing the work in an acceptable manner according to the plans and specifications. The payment of any current or partial estimate prior to final acceptance of the work by the City shall in no way constitute an acknowledgement of the acceptance of the work nor in any way prejudice or affect the obligation of the Contractor to repair, correct, renew, or replace, at his expense, any defects or imperfections

in the construction or in the strength or quality of the materials used in or about the construction of the work under contract and its appurtenances, nor any damage due or attributed to such defects, imperfections or damage shall have been discovered on or before the final inspection and acceptance of the work.

The Engineer shall be the sole judge of such defects, imperfections or damage; and the Contractor shall be liable to the City for failure to correct the same as provided herein.

**B-8-4 Payment for Extra Work:**

Extra work authorized and approved by the City Engineer and performed by the Contractor will be paid for in the manner hereinafter described, and the compensation thus provided shall be accepted by the Contractor as payment in full for all labor, material, tools, equipment and incidentals and all superintendents' time and timekeepers' services, all insurance, bond and all other overhead expenses incurred in the prosecution of the extra work. Payment for extra work will be calculated on one of the following basis, subject to all other conditions of the contract:

- (a) By unit prices agreed on in writing by both parties, payment to be for the quantity actually installed as finally measured.
- (b) By a lump sum price agreed on in writing by both parties.
- (c) By actual field cost of the work plus fifteen percent (15%) as described hereinbelow, agreed on in writing by both parties. In the event extra work is to be performed and paid for under this method, the actual field cost of the work will include the cost of all workmen, foremen, timekeepers, mechanics and laborers, and materials, supplies, trucks, rental or machinery equipment, only for the time actually employed or used on such extra work, plus all power, fuel, lubricants, water and similar operating expenses, and a rateable proportion of premiums on Performance and Payment Bonds, public liability and Workmen's Compensation and all other insurance required by law or ordinance. The Engineer will direct the form in which the accounts or actual field cost will be kept and will specify in writing the methods of doing the work, and the type and kind of machinery and equipment to be used, and shall have authority to suspend such extra work if in his judgement it is being conducted in a manner wasteful of materials, equipment, or labor, or is not being prosecuted in an efficient manner. The fifteen percent (15%) of the actual field cost to be paid the Contractor shall cover and compensate him for profit, overhead, general superintendence and field office expense, and all other elements of cost and expense not embraced within the actual field cost as herein specified. The Contractor shall give the Engineer access to all accounts, bills, invoices and vouchers relating thereto.

In the event agreement cannot be reached on method or prices of payment for extra work, the City reserves the right to enter on the job with its own forces or to hire other contractors to perform such extra work.

**B-8-5 Policy on Extra Work and Change Orders:**

The City Council of the City of Corpus Christi has adopted the following Construction Change Order Policy which will be applicable to all City construction projects, and the Contractor is hereby advised to be so guided in the proceeding with any item of work which he considers to be extra work:

- (a) All change orders require written quotations and must be approved in writing by the Contractor and the City Engineer or his representative prior to the work being done.

(b) All change orders in involving an expenditure of \$10,000.00 or more must be approved by the City Council.

(c) The City Manager, or duly authorized Assistant City Manager, has authority to approve change orders between \$5,000.00 and \$10,000.00. The City Manager may authorize change orders in excess of this amount only in emergency situations where undue delays could cause damages, either physical or monetary, to the City, Contractor, or general public. However, final approval must be granted by the City Council.

(d) The City Engineer has authority to issue change orders up to \$5,000.00.

(e) The total amount of all change orders to a contract shall not exceed 25% of the original contract price.

Contractors are advised that the City is under no obligation to appropriate change order(s) which have not been prepared and executed as stated herein. The addition of items of work covered by unit prices may be performed without written change orders unless the quantity and cost of such work, in the Engineer's opinion, require such written change orders, in which event the Contractor will be so notified.

**B-8-6 Partial Estimates:**

After the twenty-fifth (25th) day of the month and at the Contractor's request, the Engineer will make an approximate estimate of the value of the work done during the month under the specifications, which approximate estimate may include the full net invoice value of acceptable non-perishable materials delivered to the work (i.e. materials on hand). The Contractor shall furnish to the Engineer such detailed information as he may request to aid him as a guide in the preparation of partial estimates. It is understood that the partial estimates from month to month will be approximate only and all partial estimates and payments will be subject to correction in the estimate rendered following the discovery of an error in any previous estimate, and such estimate shall not in any respect be taken as an admission of the City of the amount of work done or of its quality or sufficiency nor as an acceptance of the work or the release of the Contractor of any of his responsibility under the contract.

In determining the partial payment to be made to the Contractor, the City will retain five percent (5%) of the total approximate estimate, unless otherwise stated, and will deduct payments previously made. No partial payment will be made when the said estimate or the estimates of work done since the last previous estimate is less than One Hundred Dollars (\$100.00) in amount. All retainage is due and payable to the Contractor upon successful completion of the project and will be included in the final payment. Payment shall be withheld as elsewhere herein specified.

The City reserves the right to increase the retainage. In contracts in which the total amount bid is Four Hundred Thousand Dollars (\$400,000) or more and providing for retainage of greater than five percent (5%) of the total estimate, the amount retained shall be deposited in an interest bearing account and the interest earned shall be paid to the contractor upon completion of the contract with the final payment, unless withheld as otherwise specified.

**B-8-7 Withholding Payment:**

Payment of estimates may be withheld if the work is not being executed in accordance with the specifications and contract and/or to cover known claims as elsewhere specified.

**B-8-8 Final Cleanup:**

Upon completion of the work and before acceptance and final payment will be made, the Contractor shall clean and remove from the site of the work surplus and discarded materials, temporary structures, and debris of every kind. He shall

leave the site of the work in a neat, orderly condition, equal to that which originally existed. Surplus and waste materials removed from the site of the work shall be disposed of at locations satisfactory to the Engineer. Such final cleanup shall in general be considered as subsidiary to the established pay items as a whole.

**B-8-9 Final Acceptance:**

Whenever the improvement provided for by contract shall have been completely performed on the part of the Contractor, the Contractor shall notify the Engineer that the improvement is ready for final inspection. The Engineer will then make such final inspection; and if the work is satisfactory and in accordance with the specifications and contract, he will certify such completion for Final Acceptance.

**B-8-10 Final Payment:**

Whenever the improvement provided for by contract shall have been completely performed on the part of the Contractor as evidenced by the Engineer in the Certificate of Final Inspection and Acceptance, a final estimate showing the value of the work will be prepared by the Engineer as soon as the necessary measurements and computations can be made. All prior estimates upon which payments have been made are subject to necessary corrections or revisions in the final payment. The amount of this final estimate, less any sums that have been deducted or retained under the provisions of the contract, will be paid the Contractor within thirty (30) days after Final Acceptance provided the Contractor has furnished to the City satisfactory evidence in the form of an affidavit(s) that all sums of money due for any labor, materials, apparatus, fixtures, or machinery furnished for and used in the prosecution of the work have been paid; or that the person or persons to whom the sum may respectively be due have consented to such final payment. The improvement will not be recommended for Final Acceptance until this payment affidavit has been submitted. The acceptance by the Contractor of the last payment as aforesaid shall operate as and shall be a release to the City from all claims or liabilities under the contract for anything done or furnished or relating to the work under the contract or for any act of neglect of said City relating to or connected with the contract.

**B-8-11 Maintenance Guaranty:**

The Contractor shall maintain and keep in good repair the work herein contracted to be done and performed for a period of one (1) year from the date of acceptance, or for such lesser or greater period as may be specially provided, shall do all necessary backfilling that may arise on account of sunken conditions in ditches, or otherwise, and shall do and perform all necessary work and repair any defective condition growing out of or arising from the improper joining of the same, or on account of any breaking of the same caused by the said Contractor, in laying or building the same, or on account of any defect arising in any of said parts of said work laid or constructed by said Contractor, or on account of improper excavation or backfilling; it being understood that the purpose of this section is to cover all defective conditions arising by reason of negligence of the Contractor, or by reason of defective materials, work or labor performed by the said Contractor, and in case the said Contractor shall fail to do so, it is agreed that the City may do said work and supply such materials, and charge the same against the said Contractor and sureties on this obligation. This provision shall further, and in addition, be evidence by the provisions of the Performance Bond or such other bond as may be required.



**WAGE RATES WILL BE PROVIDED BY ENGINEERING SERVICES - WE WOULD NEED TO CHECK WITH AL DAVILA FOR CURRENT WAGE RATES TO INSERT AT TIME OF PROJECT BIDDING**

INSERT APPLICABLE SPECIFICATIONS, IF ANY.

Insert LIST OF DRAWINGS, if any.

## **NOTICE**

THE FOLLOWING BLANK SPACES IN THE CONTRACT AND BONDS ARE NOT TO BE FILLED IN BY THE BIDDER AT THE TIME OF SUBMITTING HIS PROPOSAL. THE CONTRACT AND BONDS FORMS ARE SUBMITTED AT THIS TIME TO FAMILIARIZE THE BIDDER WITH THE FORM OF CONTRACT AND BONDS WHICH THE SUCCESSFUL BIDDER WILL BE REQUIRED TO EXECUTE.

A G R E E M E N T

THE STATE OF TEXAS §

COUNTY OF NUECES §

THIS AGREEMENT is entered into this KEYBOARD(date) day of KEYBOARD(month), 20KEYBOARD(year), by and between the **CITY OF CORPUS CHRISTI** of the County of Nueces, State of Texas, acting through its duly authorized City Manager, termed in the Contract Documents as "City," and KEYBOARD(company name) termed in the Contract Documents as "Contractor," upon these terms, performable in Nueces County, Texas:

In consideration of the payment of \$KEYBOARD(award amount) by City and other obligations of City as set out herein, Contractor will construct and complete certain improvements described as follows:

**KEYBOARD(project name (all caps))**

according to the attached Plans and Specifications in a good and workmanlike manner for the prices and conditions set out in their attached bid proposal supplying at their expense such materials, services, labor and insurance as required by the attached Contract Documents, including overseeing the entire job. The Contract Documents include this Agreement, the bid proposal and instructions, plans and specifications, including all maps, plats, blueprints, and other drawings, the Performance and Payment bonds, addenda, and related documents all of which constitute the contract for this project and are made a part hereof.

The Contractor will commence work within ten (10) calendar days from date they receive written work order and will substantially complete same within KEYBOARD(number & type of days to finish job) after construction is begun. Should Contractor default, Contractor may be liable for liquidated damages as set forth in the Contract Documents.

City will pay Contractor in current funds for performance of the contract in accordance with the Contract Documents as the work progresses.

Signed in 4 parts at Corpus Christi, Texas on the date shown above.

**ATTEST:**

**CITY OF CORPUS CHRISTI**

\_\_\_\_\_  
City Secretary

By: \_\_\_\_\_

Ronald F. Massey  
Assistant City Manager of  
Public Works & Utilities

**APPROVED AS TO LEGAL FORM:**

\_\_\_\_\_  
City Attorney

By: \_\_\_\_\_

Director of Engr. Services

**CONTRACTOR**

**ATTEST:** (If Corporation)

KEYBOARD(contractor)

\_\_\_\_\_  
(Seal Below)

By: \_\_\_\_\_

(Note: If person signing for corporation is not President, attach copy of authorization to sign.)

Title: \_\_\_\_\_

KEYBOARD(address)  
(Address)  
KEYBOARD(city, state & zip)  
(City) (State) (Zip)  
KEYBOARD(phone number)  
(Telephone Number)

(Revised August 2000)

P R O P O S A L   F O R M  
F O R

**KEYBOARD(PROJECT NAME)**

DEPARTMENT OF ENGINEERING SERVICES

CITY OF CORPUS CHRISTI, TEXAS

P R O P O S A L

Place:

Date: \_\_\_\_\_

Proposal of \_\_\_\_\_,  
a Corporation organized and existing under the laws of  
the State of \_\_\_\_\_.

OR

a Partnership or Individual doing business as  
\_\_\_\_\_  
\_\_\_\_\_.

TO: The City of Corpus Christi, Texas

Gentlemen:

The undersigned hereby proposes to furnish all labor and materials, tools, and necessary equipment, and to perform the work required for:

**KEYBOARD(project name)**

at the locations set out by the plans and specifications and in strict accordance with the contract documents for the following prices, to-wit:

**BASE BID: \$** \_\_\_\_\_



The undersigned hereby declares that he has visited the site and has carefully examined the plans, specifications and contract documents relating to the work covered by his bid or bids, that he agrees to do the work, and that no representations made by the City are in any sense a warranty but are mere estimates for the guidance of the Contractor.

Upon notification of award of contract, we will within ten (10) calendar days execute the formal contract and will deliver a Performance Bond (as required) for the faithful performance of this contract and a Payment Bond (as required) to insure payment for all labor and materials. The bid bond attached to this proposal, in the amount of 5% of the highest amount bid, is to become the property of the City of Corpus Christi in the event the contract and bonds are not executed within the time above set forth as liquidated damages for the delay and additional work caused thereby.

**Minority/Minority Business Enterprise Participation:** The apparent low bidder shall, within five days of receipt of bids, submit to the City Engineer, in writing, the names and addresses of MBE firms participating in the contract and a description of the work to be performed and its dollar value for bid evaluation purpose.

**Number of Signed Sets of Documents:** The contract and all bonds will be prepared in not less than four counterpart (original signed) sets.

**Time of Completion:** The undersigned agrees to complete the work within KEYBOARD(number of days) KEYBOARD(type of days) days from the date designated by a Work Order.

The undersigned further declares that he will provide all necessary tools and apparatus, do all the work and furnish all materials and do everything required to carry out the above mentioned work covered by this proposal, in strict accordance with the contract documents and the requirements pertaining thereto, for the sum or sums above set forth.

Receipt of the following addenda is acknowledged (addenda number): \_\_\_\_\_

Respectfully submitted:

Name: \_\_\_\_\_

By: \_\_\_\_\_

(SIGNATURE)

Address: \_\_\_\_\_

(P.O. Box) (Street)

(City) (State) (Zip)

Telephone: \_\_\_\_\_

(SEAL - IF BIDDER IS  
a Corporation)

**NOTE:** Do not detach bid from other papers.  
Fill in with ink and submit complete  
with attached papers.

(Revised August 2000)



**CITY OF CORPUS CHRISTI  
DISCLOSURE OF INTERESTS**

City of Corpus Christi Ordinance 17112, as amended, requires all persons or firms seeking to do business with the City to provide the following information. Every question must be answered. If the question is not applicable, answer with "NA".

**FIRM NAME:** \_\_\_\_\_

**STREET:** \_\_\_\_\_ **CITY:** \_\_\_\_\_ **ZIP:** \_\_\_\_\_

**FIRM is:** 1. Corporation      2. Partnership      3. Sole Owner      4. Association  
5. Other \_\_\_\_\_

**DISCLOSURE QUESTIONS**

If additional space is necessary, please use the reverse side of this page or attach separate sheet.

**1. State the names of each "employee" of the City of Corpus Christi having an "ownership interest" constituting 3% or more of the ownership in the above named "firm".**

Name      Job Title and City Department (if known)

\_\_\_\_\_  
\_\_\_\_\_

**2. State the names of each "official" of the City of Corpus Christi having an "ownership interest" constituting 3% or more of the ownership in the above named "firm".**

Name      Title

\_\_\_\_\_  
\_\_\_\_\_

**3. State the names of each "board member" of the City of Corpus Christi having an "ownership interest" constituting 3% or more of the ownership in the above named "firm".**

Name      Board, Commission or Committee

\_\_\_\_\_  
\_\_\_\_\_

**4. State the names of each employee or officer of a "consultant" for the City of Corpus Christi who worked on any matter related to the subject of this contract and has an "ownership interest" constituting 3% or more of the ownership in the above named "firm".**

Name      Consultant

\_\_\_\_\_  
\_\_\_\_\_

**CERTIFICATE**

I certify that all information provided is true and correct as of the date of this statement, that I have not knowingly withheld disclosure of any information requested; and that supplemental statements will be promptly submitted to the City of Corpus Christi, Texas as changes occur.

**Certifying Person:** \_\_\_\_\_ **Title:** \_\_\_\_\_  
(Type or Print)

**Signature of Certifying Person:** \_\_\_\_\_ **Date:** \_\_\_\_\_

## DEFINITIONS

- a. "Board Member". A member of any board, commission or committee appointed by the City Council of the City of Corpus Christi, Texas.
- b. "Employee". Any person employed by the City of Corpus Christi, Texas, either on a full or part time basis, but not as an independent contractor.
- c. "Firm". Any entity operated for economic gain, whether professional, industrial or commercial and whether established to produce or deal with a product or service, including but not limited to, entities operated in the form of sole proprietorship, as self-employed person, partnership, corporation, joint stock company, joint venture, receivership or trust and entities which, for purposes of taxation, are treated as non-profit organizations.
- d. "Official". The Mayor, members of the City Council, City Manager, Deputy City Manager, Assistant City Managers, Department and Division Heads and Municipal Court Judges of the City of Corpus Christi, Texas.
- e. "Ownership Interest". Legal or equitable interest, whether actually or constructively held, in a firm, including when such interest is held through an agent, trust, estate or holding entity. "Constructively held" refers to holding or control established through voting trusts, proxies or special terms of venture or partnership agreements.
- f. "Consultant". Any person or firm, such as engineers and architects, hired by the City of Corpus Christi for the purpose of professional consultation and recommendation.

**KEYBOARD (Project Name)**  
**KEYBOARD (Base Bid? Alternate Bid?)**

I	II	III	IV
BID ITEM	QTY & UNIT	DESCRIPTION	TOTAL PRICE IN FIGURES
<b>KEYBOARD</b> Item No.)	<b>KEYBOARD</b> Qty & Unit)	<b>KEYBOARD</b> (item description), complete in place per <u>KEYBOARD (unit?)</u>	\$ _____

TOTAL BASE BID: \$ \_\_\_\_\_

KEYBOARD (Project Name)  
 KEYBOARD (Base Bid? Alternate?)

I	II	III	IV
BID ITEM	QTY & UNIT	DESCRIPTION	TOTAL PRICE IN FIGURES
KEYBOARD (Item No.)	KEYBOARD (Qty. & Unit)	KEYBOARD (Item description), complete in place per <u>KEYBOARD (Unit?)</u>	\$ _____
KEYBOARD (Item No.)	KEYBOARD (Qty. & Unit)	KEYBOARD (Item description), complete in place per <u>KEYBOARD (Unit?)</u>	\$ _____

TOTAL BID: \$ \_\_\_\_\_

KEYBOARD (Project Name)  
 KEYBOARD (Base Bid? Alternate?)

I	II	III	IV
BID ITEM	QTY. & UNIT	DESCRIPTION	(TOTAL PRICE IN FIGURES)
KEYBOARD (Item No.)	KEYBOARD Qty. & Unit)	KEYBOARD (Item description), complete in place per <u>KEYBOARD (unit)</u>	\$ _____
KEYBOARD (Item No.)	KEYBOARD Qty. & Unit)	KEYBOARD (Item description), complete in place per <u>KEYBOARD (unit?)</u>	\$ _____
KEYBOARD (Item No.)	KEYBOARD Qty. & Unit)	KEYBOARD (Item description), complete in place per <u>KEYBOARD (unit)</u>	\$ _____

TOTAL BID: \$ \_\_\_\_\_

KEYBOARD (Project Name)  
 KEYBOARD (Base Bid? Alternate?)

I	II	III	IV
BID ITEM	QTY & UNIT	DESCRIPTION	TOTAL PRICE IN FIGURES
KEYBOARD (Item No.)	KEYBOARD (Qty. & Unit)	KEYBOARD (Item description), complete in place per <u>KEYBOARD (unit)</u>	\$ _____
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KEYBOARD (Item No.)	KEYBOARD (Qty. & Unit)	KEYBOARD (Item description), complete in place per <u>KEYBOARD (unit)</u>	\$ _____

**TOTAL BID:** \$ \_\_\_\_\_

KEYBOARD (Project Name)  
 KEYBOARD (Base Bid? Alternate Bid?)

I	II	III	IV	V
BID ITEM	QTY & UNIT	DESCRIPTION	UNIT PRICE IN FIGURES	BID ITEM EXTENSION (QTY X UNIT PRICE IN FIGURES)
KEYBOARD Item No.	KEYBOARD Qty & Unit	KEYBOARD (item description), complete in place per _ KEYBOARD (unit?)	_____ _____	\$ _____ _____

TOTAL BID: \$ \_\_\_\_\_



KEYBOARD (Project Name)  
 KEYBOARD (Base Bid? Alternate?)

I	II	III	IV	V
BID ITEM	QTY. & UNIT	DESCRIPTION	UNIT PRICE IN FIGURES	BID ITEM EXTENSION (QTY X UNIT PRICE IN FIGURES)
KEYBOARD Item No.)	KEYBOARD Qty. & Unit)	KEYBOARD (Item description), complete in place per _ KEYBOARD (Unit?)	_____	\$ _____
KEYBOARD Item No.)	KEYBOARD Qty. & Unit)	KEYBOARD (Item description), complete in place per _ KEYBOARD (Unit?)	_____	\$ _____

TOTAL BID: \$ \_\_\_\_\_

KEYBOARD (Project Name)  
 KEYBOARD (Base Bid? Alternate?)

I	II	III	IV	V
BID ITEM	QTY. & UNIT	DESCRIPTION	UNIT PRICE IN FIGURES	BID ITEM EXTENSION (QTY X UNIT PRICE IN FIGURES)
KEYBOARD Item No.)	KEYBOARD Qty. & Unit)	KEYBOARD (Item description), complete in place per <u>KEYBOARD (unit)</u>	_____	\$ _____
KEYBOARD Item No.)	KEYBOARD Qty. & Unit)	KEYBOARD (Item description), complete in place per <u>KEYBOARD (unit?)</u>	_____	\$ _____
KEYBOARD Item No)	KEYBOARD Qty. & Unit)	KEYBOARD (Item description), complete in place per <u>KEYBOARD (unit)</u>	_____	\$ _____

TOTAL BID: \$ \_\_\_\_\_

KEYBOARD(Project Name)  
 KEYBOARD(Base Bid? Alternate?)

I	II	III	IV	V
BID ITEM	QTY & UNIT	DESCRIPTION	UNIT PRICE IN FIGURES	BID ITEM EXTENSION (QTY X UNIT PRICE IN FIGURES)
KEYBOARD (Item No.)	KEYBOARD (Qty. & Unit)	KEYBOARD (Item description), complete in place per _ KEYBOARD (unit)	_____	\$ _____
KEYBOARD (Item No.)	KEYBOARD (Qty. & Unit)	KEYBOARD (Item description), complete in place per _ KEYBOARD (unit)	_____	\$ _____
KEYBOARD (Item No.)	KEYBOARD (Qty. & Unit)	KEYBOARD (Item description), complete in place per _ KEYBOARD (unit)	_____	\$ _____
KEYBOARD (Item No.)	KEYBOARD (Qty. & Unit)	KEYBOARD (Item description), complete in place per _ KEYBOARD (unit)	_____	\$ _____

TOTAL BID: \$ \_\_\_\_\_

P E R F O R M A N C E   B O N D

STATE OF TEXAS   §

KNOW ALL BY THESE PRESENTS:

COUNTY OF NUECES   §

THAT \_\_\_\_\_ of \_\_\_\_\_ County, Texas, hereinafter called "Principal", and \_\_\_\_\_, a corporation organized under the laws of the State of \_\_\_\_\_, and duly authorized to do business in the State of Texas, hereinafter called "Surety", are held and firmly bound unto the City of Corpus Christi, a municipal corporation of Nueces County, Texas, hereinafter called "City", in the penal sum of KEYBOARD(amount in words) (KEYBOARD(amount in figures)) DOLLARS, lawful money of the United States, to be paid in Nueces County, Texas, for the payment of which sum well and truly to be made we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents:

**THE CONDITION OF THIS OBLIGATION IS SUCH THAT:** Whereas, the principal entered into a certain contract with the City of Corpus Christi, dated the KEYBOARD(day) of KEYBOARD(month), 20KEYBOARD(year), a copy of which is hereto attached and made a part hereof, for the construction of:

**KEYBOARD(project name)**

**NOW, THEREFORE,** if the principal shall faithfully perform said work in accordance with the plans, specifications and contract documents, including any changes, extensions, or guaranties, and if the principal shall repair and/or replace all defects due to faulty materials and/or workmanship that appear within a period of one (1) year from the date of completion and acceptance of improvements by the City, then this obligation shall be void; otherwise to remain in full force and effect.

**PROVIDED FURTHER,** that if any legal action be filed on this bond, venue shall lie in Nueces County, Texas.

And that said surety for value received hereby stipulates that no change, extension of time, alteration or addition to the terms of the contract, or to the work performed thereunder, or the plans, specifications, drawings, etc., accompanying the same shall in anywise affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract, or to the work to be performed thereunder.

This bond is given to meet the requirements of Article 5160, Vernon's Civil Statutes of Texas, and other applicable statutes of the State of Texas.

The undersigned agent is hereby designated by the Surety herein as the Agent Resident in Nueces County to whom any requisite notices may be delivered and on whom service of process may be had in matters arising out of such suretyship, as provided by Art. 7.19-1, Vernon's Texas Insurance Code.

**IN WITNESS WHEREOF**, this instrument is executed in 4 copies, each one of which shall be deemed an original, this the \_\_\_\_ day of \_\_\_\_\_, 20\_\_.

**PRINCIPAL**

\_\_\_\_\_

By: \_\_\_\_\_

**ATTEST**

\_\_\_\_\_

Secretary

**SURETY**

\_\_\_\_\_

\_\_\_\_\_

By: \_\_\_\_\_

Attorney-in-fact

The Resident Agent of the Surety in Nueces County, Texas, for delivery of notice and service of process is:

NAME: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

(P.O. Box) \_\_\_\_\_ (Street)

(City) \_\_\_\_\_ (State) (Zip)

(NOTE: Date of Performance Bond must not be prior to date of contract.)

(Revised August 2000)

P A Y M E N T   B O N D

STATE OF TEXAS            ( )

KNOW ALL BY THESE PRESENTS:

COUNTY OF NUECES       ( )

THAT \_\_\_\_\_ of \_\_\_\_\_ County, Texas, hereinafter called "Principal" and \_\_\_\_\_, a corporation organized under the laws of the state of \_\_\_\_\_ and duly authorized to do business in the State of Texas, hereinafter called "Surety", are held and firmly bound unto the City of Corpus Christi, a municipal corporation of Nueces County, Texas, hereinafter called "City", and unto all persons, firms and corporations supplying labor and materials in prosecution of the work referred to in the attached contract, in the penal sum of \_\_\_\_\_ (\$ \_\_\_\_\_) DOLLARS, lawful money of the United States, to be paid in Nueces County, Texas, for the payment of which sum well and truly to be made we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents:

THE CONDITION OF THIS OBLIGATION IS SUCH THAT: Whereas, the principal entered into a certain contract with the City of Corpus Christi, dated the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, a copy of which is hereto attached and made a part hereof, for the construction of

KEYBOARD(PROJECT NAME (bold/caps))

NOW, THEREFORE, if the principal shall faithfully perform its duties and make prompt payment to all persons, firms, subcontractors, corporations and claimants supplying labor and material in the prosecution of the work provided for in said contract and any and all duly authorized modification of said contract that may hereinafter be made, notice of which modification to the surety is hereby expressly waived, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED FURTHER, that if any legal action be filed upon this bond, venue shall lie in Nueces County, Texas.

And that said surety for value received hereby stipulates that no change, extension of time, alteration or addition to the terms of the contract, or to the work performed thereunder, or the plans, specifications, drawings, etc., accompanying the same shall in anywise affect its obligation on this bond and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract, or to the work to be performed thereunder.

B

Editing Notes CALL Angel R. Escoban 880-3507  
Asst Dir Engr. SRVS  
for QUESTIONS / CLARIFICATIONS

Block out and MUST  
USE SAME  
PROJECT NAME on  
ALL DOCUMENTS  
incl DWGS

SPECIAL PROVISIONS  
SPECIFICATIONS  
AND  
FORMS OF CONTRACTS AND BONDS  
FOR

LARGE  
KEYBOARD (Project Name (caps/bold))

KEYBOARD (if A/E Consultant, type in name/address/etc.  
(centered), if not, by-pass)

A/E  
SEAL & SIGNATURE  
+ DATE

A/E CONSULTANT

Firm Name \_\_\_\_\_  
Address \_\_\_\_\_  
Phone # \_\_\_\_\_  
Fax # \_\_\_\_\_

FOR

DEPARTMENT OF ENGINEERING SERVICES  
CITY OF CORPUS CHRISTI, TEXAS  
Phone: 361/880-3500  
Fax: 361/880-3501

PROJECT NO: KEYBOARD (City  
Project #)

Get form Kath Bush  
880-3534

DRAWING NO: KEYBOARD (24x36  
Plan Drawing(s) No.)

Get form Cassin Longoria 880-37...  
or Carlos Reyna 880-383...



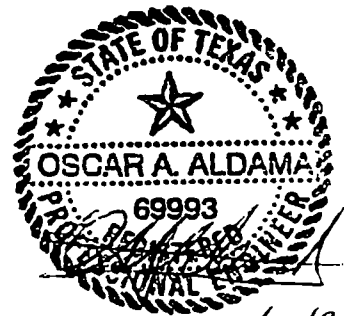
SPECIAL PROVISIONS  
SPECIFICATIONS  
AND  
FORMS OF CONTRACTS AND BONDS  
FOR

*Sample*

ALLISON WASTEWATER TREATMENT PLANT  
AIR LEAKS REPAIR - 1997

Prepared By:

INDTECH, Inc.  
9359 IH 37  
Corpus Christi, Texas 78409  
Telephone (512) 241-8160  
Fax (512) 241-8170



*11/18/97*

For

DEPARTMENT OF ENGINEERING SERVICES

CITY OF CORPUS CHRISTI, TEXAS

City Project No. 7081

DWG: No. STL 102

IF A Sp. PROVISION  
will NOT be USED  
indicate with **NOT USED**

all cap's  
+  
Bold Type

AND

STRIKE-OUT PROVISION

NOTE IF ONLY A PORTION IS NOT BEING  
USED

STRIKE-OUT (only that portion)

\* DO NOT indicate **NOT USED**

**SAMPLE ONLY**

A-17 Field Office (Revised 10/96)

**NOT USED**

~~The contractor shall furnish the City with a field office at the construction site. The field office shall contain at least 120 square feet of useable space. The field office shall be air conditioned and heated and shall be furnished with an inclined table that measures at least 30" x 60" and two (2) chairs. The contractor shall move the field office on the site as required by the Engineer. The field office shall be furnished with a telephone (with 24-hour per day answering service) and FAX machine paid for by the contractor. There shall be no separate pay item for the field office.~~

A-18 Schedule and Sequence of Construction

The contractor shall submit to the City a work plan based only on working days. This plan shall detail the schedule of work and shall be submitted to the City at least three (3) working days prior to the pre-construction meeting.

The plan shall indicate the schedule of the following work items:

1. Initial Schedule: Submit to the Engineer three (3) days prior to the Pre-Construction Meeting an initial Construction Progress Schedule for review.
2. Items to Include: Show complete sequence of construction by activity, identifying work of separate stages and other logically grouped activities. Identify the first work day of each week.
3. Submittal Dates: Indicate submittal dates required for all submittals.
4. Re-submission: Revise and resubmit as required by the Engineer.
5. Periodic Update: Submit Updated Construction Progress Schedule to show actual progress of each stage by percentage against initial schedule.

Look

(Revised 7/5/00)

Must be same as cover sheet.

KEYBOARD (Name of Project (ALL CAPS))

### Table of Contents

NOTICE TO BIDDERS (Revised 7/5/00)

NOTICE TO CONTRACTORS - A (Revised Sept. 2000)  
Insurance Requirements

NOTICE TO CONTRACTORS - B (Revised 7/5/00)

Worker's Compensation Coverage For Building or Construction  
Projects For Government Entities

#### PART A - SPECIAL PROVISIONS

- A-1 Time and Place of Receiving Proposals/Pre-Bid Meeting
- A-2 Definitions and Abbreviations
- A-3 Description of Project
- A-4 Method of Award
- A-5 Items to be Submitted with Proposal
- A-6 Time of Completion/Liquidated Damages
- A-7 Workers Compensation Insurance Coverage
- A-8 Faxed Proposals
- A-9 Acknowledgment of Addenda
- A-10 Wage Rates (Revised 7/5/00)
- A-11 Cooperation with Public Agencies (Revised 7/5/00)
- A-12 Maintenance of Services
- A-13 Area Access and Traffic Control
- A-14 Construction Equipment Spillage and Tracking
- A-15 Excavation and Removals
- A-16 Disposal/Salvage of Materials
- A-17 Field Office
- A-18 Schedule and Sequence of Construction
- A-19 Construction Staking
- A-20 Testing and Certification
- A-21 Project Signs
- A-22 Minority/Minority Business Enterprise Participation Policy (Revised 10/98)
- A-23 Inspection Required (Revised 7/5/00)
- A-24 Surety Bonds
- ~~A-25 Sales Tax Exemption NO LONGER APPLICABLE (6/11/98)~~
- A-26 Supplemental Insurance Requirements
- A-27 Responsibility for Damage Claims
- A-28 Considerations for Contract Award and Execution
- A-29 Contractor's Field Administration Staff
- A-30 Amended "Consideration of Contract" Requirements
- A-31 Amended Policy on Extra Work and Change Orders
- A-32 Amended "Execution of Contract" Requirements
- A-33 Conditions of Work
- A-34 Precedence of Contract Documents
- A-35 City Water Facilities Special Requirements
- A-36 Other Submittals (Revised 9/18/00)

List as shown, whether used or not

CITY WILL FURNISH & INSERT

FOR CITY STAFF ONLY

Option 1: CIP Funded  
only need Wage Rates

Option 2: CDBG/FAA  
Must include Fed.Reg.  
(Yellow Sheets)

USE ONLY FOR

TWDB (SRF) FUNDED PROJECTS

Otherwise, OMIT  
DO NOT SHOW

- A-37 Amended "Arrangement and Charge for Water Furnished by the City"
- A-38 Worker's Compensation Coverage for Building or Construction Projects for Government Entities
- A-39 Certificate of Occupancy and Final Acceptance
- A-40 Amendment to Section B-8-6: Partial Estimates
- A-41 Ozone Advisory
- A-42 OSHA Rules & Regulations
- A-43 Amended Indemnification & Hold Harmless (9/98)
- A-44 Change Orders (4/26/99)
- A-45 As-Built/Dimensions and Drawings (7/5/00)
- A-46 Disposal of Highly Chlorinated Water (7/5/00)
- A-47 Pre-Construction Exploratory Excavations (7/5/00)
- A-48 Overhead Electrical Wires (7/5/00)
- A-49 Amend "Maintenance Guaranty" (8/24/00)

→ **SUPPLEMENTAL SPECIAL PROVISIONS**

**PART B - GENERAL PROVISIONS**

**PART C - FEDERAL WAGE RATES AND REQUIREMENTS**

→ **PART S - STANDARD SPECIFICATIONS**

**LIST OF DRAWINGS** ← List by Drawing Sheet No. & Title

**NOTICE**

**AGREEMENT**

**PROPOSAL/DISCLOSURE STATEMENT**

**PERFORMANCE BOND**

**PAYMENT BOND**

Use 16 Divisions for City Standard Specs  
List by No. & Title

AND/OR

If New Spec, other than City Standard, THEN, MUST USE

PART "T" - Technical Specifications (List by No. & Title)

\*After Standard/Technical Specs,  
List any Exhibits  
Photos  
Appendix

Project description should describe what Gen work catagories/or elements of work the project will include, i.e.,

excavation	demolition
caliche base	building construction
concrete curb/SW	painting
storm pipe	drywall
water pipe	fence

**NOTICE TO BIDDERS**

Sealed proposals, addressed to the City of Corpus Christi, Texas for:

KEYBOARD(project name (all caps)) consists of KEYBOARD(project description) in accordance with the plans, specifications and contract documents;

will be received at the office of the City Secretary until 2:00 p.m. on Wednesday, KEYBOARD(BID DATE), and then publicly opened and read. Any bid received after closing time will be returned unopened.

A KEYBOARD(Mandatory? if yes, say MANDATORY, if not by-pass) pre-bid meeting is scheduled for KEYBOARD(day of week/date/time/location). The pre-bid meeting will be conducted by the City, and will include KEYBOARD(what? a tour? ) KEYBOARD(If NO pre-bid mtg., only include next sentence---REMEMBER TO DELETE ALL TEXT PRECEDING) There will be NO pre-bid meeting for this project.

KEYBOARD(cdbg proj? If yes, leave paragraph, if not, delete.) This project is funded in part through the Community Development Act of KEYBOARD(City Proj Engineer will provide), year program. Approximately \$KEYBOARD(City Proj Engineer will provide) of the total estimated project cost will be funded through this source. A bid bond in the amount of 5% of the highest amount bid must accompany each proposal. Failure to provide the bid bond will constitute a non-responsive proposal which will not be considered. Failure to provide required performance and payment bonds for contracts over \$25,000.00 will result in forfeiture of the 5% bid bond to the City as liquidated damages. Bidder's plan deposit is subject to mandatory forfeiture to the City if bidding documents are not returned to the City within two weeks of receipt of bids.

Plans, proposal forms, specifications and contract documents may be procured from the City Engineer upon a deposit of Fifty and no/100 Dollars (\$50.00) as a guarantee of their return in good condition within two weeks of bid date. Documents can be obtained by mail upon receipt of an additional (\$10.00) which is a non-refundable postage/handling charge.

The bidder is hereby notified that the owner has ascertained the wage rates which prevail in the locality in which this work is to be done and that such wage scale is set out in the contract documents obtainable at the office of the City Engineer and the Contractor shall pay not less than the wage rates so shown for each craft or type of "laborer," "workman," or "mechanic" employed on this project.

The City reserves the right to reject any or all bids, to waive irregularities and to accept the bid which, in the City's opinion, seems most advantageous to the City and in the best interest of the public.

CITY OF CORPUS CHRISTI, TEXAS

/s/'Angel R. Escobar, P.E.  
Director of Engrg. Services

/s/ Armando Chapa  
City Secretary

MUST BE SAME AS TITLE ON PLANS

Will be assigned by Engr. Services

Indicate whether or not a pre-bid mtg. will be held. Insert information requested.

Only for CDBG: If not, bypass.

DO NOT EDIT, CHANGE OR DELETE!

## NOTICE TO CONTRACTORS - A INSURANCE REQUIREMENTS

Revised September, 2000

A Certificate of Insurance indicating proof of coverage in the following amounts is required:

TYPE OF INSURANCE	MINIMUM INSURANCE COVERAGE
30-Day Notice of Cancellation required on all certificates	Bodily Injury and Property Damage
Commercial General Liability including: 1. Commercial Form 2. Premises - Operations 3. Explosion and Collapse Hazard 4. Underground Hazard 5. Products/ Completed Operations Hazard 6. Contractual Insurance 7. Broad Form Property Damage 8. Independent Contractors 9. Personal Injury	\$2,000,000 COMBINED SINGLE LIMIT
AUTOMOBILE LIABILITY--OWNED NON-OWNED OR RENTED	\$1,000,000 COMBINED SINGLE LIMIT
WORKERS' COMPENSATION	WHICH COMPLIES WITH THE TEXAS WORKERS' COMPENSATION ACT AND PARAGRAPH II OF THIS EXHIBIT
EMPLOYERS' LIABILITY	\$100,000
EXCESS LIABILITY	\$1,000,000 COMBINED SINGLE LIMIT
PROFESSIONAL POLLUTION LIABILITY/ ENVIRONMENTAL IMPAIRMENT COVERAGE Not limited to sudden & accidental discharge; to include long-term environmental impact for the disposal of contaminants	\$2,000,000 COMBINED SINGLE LIMIT <input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED
BUILDERS' RISK	See Section B-6-11 and Supplemental Insurance Requirements <input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED
INSTALLATION FLOATER	See Section B-6-11 and Supplemental Insurance Requirements <input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED

Must indicate with **BOLD TYPE** "X", if required or not.

€The City of Corpus Christi must be named as an **additional insured** on all coverages except worker's compensation liability coverage.

€The **name of the project** must be listed under "description of operations" on each certificate of insurance.

€For each insurance coverage, the Contractor shall obtain an endorsement to the applicable insurance policy, signed by the insurer, providing the City with thirty (30) days prior written notice of cancellation of or material change on any coverage. The Contractor shall provide to the City the other endorsements to insurance policies or coverages which are specified in section B-6-11 or Special Provisions section of the contract.

A completed "**Disclosure of Interest**" must be submitted with your proposal.

*Should you have any questions regarding insurance requirements, please contact the Contract Administrator at 880-3500.*

## NOTICE TO CONTRACTORS - B

### WORKER'S COMPENSATION COVERAGE FOR BUILDING OR CONSTRUCTION PROJECTS FOR GOVERNMENT ENTITIES

Texas law requires that most contractors, subcontractors, and others providing work or services for a City building or construction project must be covered by worker's compensation insurance, authorized self-insurance, or an approved worker's compensation coverage agreement.

Even if Texas law does not require a contractor, subcontractor or others performing project services (including deliveries to the job site) to provide 1 of the 3 forms of worker's compensation coverage, the City will require such coverage for all individuals providing work or services on this Project at any time, including during the maintenance guaranty period. Motor carriers which are required to register with the Texas Department of Transportation under Texas Civil Statutes Article 6675c, and which provide accidental insurance coverage under Texas Civil Statutes Article 6675c, Section 4(j) need not provide 1 of the 3 forms of worker's compensation coverage.

The Contractor agrees to comply with all applicable provisions of Texas Administrative Code Title 28, Section 110.110, a copy of which is attached and deemed incorporated into the project contract. Please note that under section 110.110:

1. certain language must be included in the Contractor's Contract with the City and the Contractor's contracts with subcontractors and others providing services for the Project;
2. the Contractor is required to submit to the City certificates of coverage for its employees and for all subcontractors and others providing services on the Project. The Contractor is required to obtain and submit updated certificates showing extension of coverage during the Project; and
3. the contractor is required to post the required notice at the job site.

By signing this Contract, the Contractor certifies that it will timely comply with these Notice to Contractors "B" requirements.



## Title 28. INSURANCE

### Part II. TEXAS WORKERS' COMPENSATION COMMISSION

#### Chapter 110. REQUIRED NOTICES OF COVERAGE

##### Subchapter B. EMPLOYER NOTICES

###### § 110.110 Reporting Requirements for Building or Construction Projects for Governmental Entities

---

(a) The following words and terms, when used in this rule, shall have the following meanings, unless the context clearly indicates otherwise. Terms not defined in this rule shall have the meaning defined in the Texas Labor Code, if so defined.

(1) Certificate of coverage (certificate)—A copy of a certificate of insurance, a certificate of authority to self-insure issued by the commission, or a workers' compensation coverage agreement (TWCC-81, TWCC-82, TWCC-83, or TWCC-84), showing statutory workers' compensation insurance coverage for the person's or entity's employees (including those subject to a coverage agreement) providing services on a project for the duration of the project.

(2) Building or construction—Has the meaning defined in the Texas Labor Code, § 406.096(e)(1).

(3) Contractor—A person bidding for or awarded a building or construction project by a governmental entity.

(4) Coverage—Workers' compensation insurance meeting the statutory requirements of the Texas Labor Code, § 401.011(44).

(5) Coverage agreement—A written agreement on form TWCC-81, form TWCC-82, form TWCC-83, or form TWCC-84, filed with the Texas Workers' Compensation Commission which establishes a relationship between the parties for purposes of the Texas Workers' Compensation Act, pursuant to the Texas Labor Code, Chapter 406, Subchapters F and G, as one of employer/employee and establishes who will be responsible for providing workers' compensation coverage for persons providing services on the project.

(6) Duration of the project—Includes the time from the beginning of work on the project until the work on the project has been completed and accepted by the governmental entity.

(7) Persons providing services on the project ("subcontractor" in § 406.096 of the Act)—With the exception of persons excluded under subsections (h) and (i) of this section, includes all persons or entities performing all or part of the services the contractor has undertaken to perform on the project regardless of whether that person contracted directly with the contractor and regardless of whether that person has employees. This includes but is not limited to independent contractors, subcontractor leasing companies, motor carriers, owner-operators, employees of any such entity, or employees of any entity furnishing persons to perform services on the project. "Services" includes but is not limited

28 TAC 110.110

to providing, hauling, or delivering equipment or materials, or providing labor, transportation, or other service related to a project. Services does not include activities unrelated to the project, such as food/beverage vendors, office supply deliveries, and delivery of portable toilets.

(8) Project—Includes the provision of all services related to a building or construction contract for a governmental entity.

(b) Providing or causing to be provided a certificate of coverage pursuant to this rule is a representation by the insured that all employees of the insured who are providing services on the project are covered by workers' compensation coverage, that the coverage is based on proper reporting of classification codes and payroll amounts, and that all coverage agreements have been filed with the appropriate insurance carrier or, in the case of a self-insured, with the commission's Division of Self-Insurance Regulation. Providing false or misleading certificates of coverage, or failing to provide or maintain required coverage, or failing to report any change that materially affects the provision of coverage may subject the contractor or other person providing services on the project to administrative penalties, criminal penalties, civil penalties, or other civil actions.

(c) A governmental entity that enters into a building or construction contract on a project shall:

(1) include in the bid specifications, all the provisions of paragraph (7) of this subsection, using the language required by paragraph (7) of this subsection;

(2) as part of the contract, using the language required by paragraph (7) of this subsection, require the contractor to perform as required in subsection (d) of this section;

(3) obtain from the contractor a certificate of coverage for each person providing services on the project, prior to that person beginning work on the project;

(4) obtain from the contractor a new certificate of coverage showing extension of coverage:

(A) before the end of the current coverage period, if the contractor's current certificate of coverage shows that the coverage period ends during the duration of the project; and

(B) no later than seven days after the expiration of the coverage for each other person providing services on the project whose current certificate shows that the coverage period ends during the duration of the project;

(5) retain certificates of coverage on file for the duration of the project and for three years thereafter;

(6) provide a copy of the certificates of coverage to the commission upon request and to any person entitled to them by law; and

(7) use the language contained in the following Figure 1 for bid specifications and contracts, without any additional words or changes, except those required to accommodate the specific document in which they are contained or to impose stricter standards of documentation:

T28S110.110(c)(7)

:bl

18 TAC 110.110

(1) A contractor shall:

(1) provide coverage for its employees providing services on a project, for the duration of the project, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements;

(2) provide a certificate of coverage showing workers' compensation coverage to the governmental entity prior to beginning work on the project;

(3) provide the governmental entity, prior to the end of the coverage period, a new certificate of coverage showing extension of coverage, if the coverage period shown on the contractor's current certificate of coverage ends during the duration of the project;

(4) obtain from each person providing services on a project, and provide to the governmental entity:

A) a certificate of coverage, prior to that person beginning work on the project, so the governmental entity will have on file certificates of coverage showing coverage for all persons providing services on the project; and

B) no later than seven days after receipt by the contractor, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

(5) retain all required certificates of coverage on file for the duration of the project and for one year thereafter;

(6) notify the governmental entity in writing by certified mail or personal delivery, within ten days after the contractor knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project;

(7) post a notice on each project site informing all persons providing services on the project that they are required to be covered, and stating how a person may verify current coverage and report failure to provide coverage. This notice does not satisfy other posting requirements imposed by the Act or other commission rules. This notice must be printed with a title in at least 30 point bold type and text in at least 19 point normal type, and shall be in both English and Spanish and any other language common to the worker population. The text for the notices shall be the following text provided by the commission on the sample notice, without any additional words or changes:

#### REQUIRED WORKERS' COMPENSATION COVERAGE

"The law requires that each person working on this site or providing services related to this construction project must be covered by workers' compensation insurance. This includes persons providing, hauling, or delivering equipment or materials, or providing labor or transportation or other service related to the project, regardless of the identity of their employer or status as an employee."

"Call the Texas Workers' Compensation Commission at 512-440-3789 to receive information on the legal requirement for coverage, to verify whether your employer has provided the required coverage, or to report an employer's failure to provide coverage."

28 TAC 110.110

(S) contractually require each person with whom it contracts to provide services on a project to:

(A) provide coverage based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements for all of its employees providing services on the project, for the duration of the project;

(B) provide a certificate of coverage to the contractor prior to that person beginning work on the project;

(C) include in all contracts to provide services on the project the language in subsection (e)(3) of this section;

(D) provide the contractor, prior to the end of the coverage period, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

(E) obtain from each other person with whom it contracts, and provide to the contractor:

(i) a certificate of coverage, prior to the other person beginning work on the project; and

(ii) prior to the end of the coverage period, a new certificate of coverage showing extension of the coverage period, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

(F) retain all required certificates of coverage on file for the duration of the project and for one year thereafter;

(G) notify the governmental entity in writing by certified mail or personal delivery, within ten days after the person knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project; and

(H) contractually require each other person with whom it contracts, to perform as required by subparagraphs (A)-(H) of this paragraph, with the certificate of coverage to be provided to the person for whom they are providing services.

(e) A person providing services on a project, other than a contractor, shall:

(1) provide coverage for its employees providing services on a project, for the duration of the project based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements;

(2) provide a certificate of coverage as required by its contract to provide services on the project, prior to beginning work on the project;

(3) have the following language in its contract to provide services on the project: "By signing this contract or providing or causing to be provided a certificate of coverage, the person signing this contract is representing to the governmental entity that all employees of the person signing this contract who will provide services on the project will be covered by workers' compensation coverage

23 110 110 110

for the duration of the project, that the coverage will be based on proper reporting of classification codes and payroll amounts, and that all coverage agreements will be filed with the appropriate insurance carrier or, in the case of a self-insured, with the commission's Division of Self-Insurance Regulation. Providing false or misleading information may subject the contractor to administrative penalties, criminal penalties, civil penalties, or other civil actions."

(4) provide the person for whom it is providing services on the project, prior to the end of the coverage period shown on its current certificate of coverage, a new certificate showing extension of coverage, if the coverage period shown on the certificate of coverage ends during the duration of the project;

(5) obtain from each person providing services on a project under contract to it, and provide as required by its contract:

(A) a certificate of coverage, prior to the other person beginning work on the project; and

(B) prior to the end of the coverage period, a new certificate of coverage showing extension of the coverage period, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

(6) retain all required certificates of coverage on file for the duration of the project and for one year thereafter;

(7) notify the governmental entity in writing by certified mail or personal delivery, of any change that materially affects the provision of coverage of any person providing services on the project and send the notice within ten days after the person knew or should have known of the change; and

(8) contractually require each other person with whom it contracts to:

(A) provide coverage based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements for all of its employees providing services on the project, for the duration of the project;

(B) provide a certificate of coverage to it prior to that other person beginning work on the project;

(C) include in all contracts to provide services on the project the language in paragraph (3) of this subsection;

(D) provide, prior to the end of the coverage period, a new certificate of coverage showing extension of the coverage period, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

(E) obtain from each other person under contract to it to provide services on the project, and provide as required by its contract:

(i) a certificate of coverage, prior to the other person beginning work on the project; and

(ii) prior to the end of the coverage period, a new certificate of coverage showing extension of the coverage period, if the coverage period shown on the current certificate of coverage ends during the

19 TEX. REG. 8609

duration of the contract;

(F) retain all required certificates of coverage on file for the duration of the project and for one year thereafter;

(G) notify the governmental entity in writing by certified mail or personal delivery, within ten days after the person knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project; and

(H) contractually require each person with whom it contracts, to perform as required by this subparagraph and subparagraphs (A)-(G) of this paragraph, with the certificate of coverage to be provided to the person for whom they are providing services.

(f) If any provision of this rule or its application to any person or circumstance is held invalid, the invalidity does not affect other provisions or applications of this rule that can be given effect without the invalid provision or application, and to this end the provisions of this rule are declared to be severable.

(g) This rule is applicable for building or construction contracts advertised for bid by a governmental entity on or after September 1, 1994. This rule is also applicable for those building or construction contracts entered into on or after September 1, 1994, which are not required by law to be advertised for bid.

(h) The coverage requirement in this rule does not apply to motor carriers who are required pursuant to Texas Civil Statutes, Article 6675c, to register with the Texas Department of Transportation and who provide accidental insurance coverage pursuant to Texas Civil Statutes, Article 6675c, § 4(j).

(i) The coverage requirement in this rule does not apply to sole proprietors, partners, and corporate officers who meet the requirements of the Act, § 406.097(c), and who are explicitly excluded from coverage in accordance with the Act, § 406.097(a) (as added by House Bill 1089, 74th Legislature, 1995, § 1.20). This subsection applies only to sole proprietors, partners, and corporate executive officers who are excluded from coverage in an insurance policy or certificate of authority to self-insure that is delivered, issued for delivery, or renewed on or after January 1, 1996.

Source: The provisions of this § 110.110 adopted to be effective September 1, 1994, 19 TexReg 5715; amended to be effective November 6, 1995, 20 TexReg 8609.

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[Return to Section Index](#)

Must be same as Title Sheet

KEYBOARD(Name of Project (ALL CAPS))

SECTION A - SPECIAL PROVISIONS

A-1 Time and Place of Receiving Proposals/Pre-Bid Meeting

Same as on NOTICE TO BIDDERS

Sealed proposals will be received in conformity with the official advertisement inviting bids for the project. Proposals will be received in the office of the City Secretary, located on the first floor of City Hall, 1201 Leopard Street, until 2:00 p.m., Wednesday, KEYBOARD(Date of Bid). Proposals mailed should be addressed in the following manner:

City of Corpus Christi  
City Secretary's Office  
1201 Leopard Street  
Corpus Christi, Texas 78401  
ATTN: BID PROPOSAL - (IDENTIFY PROJECT NAME)

Must be same as Title Sheet

Fill In Min. 7-days prior to receiving bids

A pre-bid meeting will be held on KEYBOARD(Day of Week & Date of Meeting), beginning at KEYBOARD(Time of Mtg. am? pm?). The pre-bid meeting will convene at KEYBOARD(Location of Mtg.), and will include KEYBOARD(What Will Mtg. Cover)

No additional or separate visitations will be conducted by the City.

A-2 Definitions and Abbreviations

Section B-1 of the General Provisions will govern.

Explain, i.e., tour of project, Q/A, etc.

A-3 Description of Project

Must all be same as in NOTICE TO BIDDERS

This project consists of KEYBOARD(Project Description).

KEYBOARD(assessment project? if yes, leave paragraph, if not, delete) This is an assessment project. The City will carry all notes and liens and conduct the necessary legal proceedings. The Contractor should anticipate a possible delay of two (2) to three (3) months following receipt of bids to allow the City time to complete the assessment hearing process. The contract will be awarded after the required hearing on assessments is held by the City. The public hearing will be held within two (2) months after receipt of bids. The City may cancel the award, or any part thereof, if the proceedings of the public hearing are not successful. If the award is canceled, such cancellation shall not constitute the basis for a claim by the Contractor for damages or anticipated profit.

Use only for Paving Assessment Projects

See attached Samples for A-4

A-4 Method of Award

The bids will be evaluated based on the Total Base Bid, or KEYBOARD(A List of Additive Alternates in Order of Priority).

The City reserves the right to reject any or all bids, to waive irregularities and to accept the bid which, in the City's opinion, is most advantageous to the City and in the best interest of the public.

A-5 Items to be Submitted with Proposal

**A-4**  
**SAMPLE ONLY**

A-4 Method of Award (Revised 12/94)

The bids will be evaluated based on the following order subject to availability of funds:

1. Total Base Bid;
2. Total Base Bid plus Additive Alternate No. 1 or;
3. Total Base Bid plus Additive Alternate No. 1, plus Additive Alternate No.2.

The City reserves the right to reject any or all bids, to waive irregularities and to accept the bid which, in the City's opinion, is most advantageous to the City and in the best interest of the public.

Explanation of Proposal

The description of the Base Bid and each Additive Alternate follows:

Base Bid: consists of channel excavation between Holly Road and Persimmon Street, removal and reconstruction of existing post inlets and storm sewer outfalls from Holly Road culvert to Kostoryz Road confluence and construction of about 2500 total linear feet of 10 and 12 inch sanitary sewer and appurtenances and removal of an existing CMP culvert and construction of a single 10'x8' box culvert with headwall, all in accordance with specifications and contract documents.

Additive Alternate #1: consists of channel excavation between Persimmon Street and the concrete rip rap at the bend (Sta 182+50 to Sta 169+25), and cleaning of debris in channel bottom on concrete rip rap along bend (Sta 169+25 to Sta 166+50) all in accordance with specifications and contract documents.

Additive Alternate #2: consists of channel excavation between the concrete rip rap at the bend and the Kostoryz confluence (Sta 166+50 to Sta 144), all in accordance with specifications and contract documents.

Look →



**A-4**  
**SAMPLE ONLY**

A-4 Method of Award (Revised 12/90)

The bids will be evaluated based in the following order of priority.

1. Total Base Bid minus Deductive Alternates No. 1 and 2.
2. Total Base Bid

The City reserves the right to reject any or all bids, to waive irregularities and to accept the bid which, in the City's opinion, is most advantageous to the City and in the best interest of the public.

This project will be based on the Contractor using City effluent in all phases of construction, including cleaning of the existing sanitary sewer and curing of the proposed Cured-In-Place-Pipe.

The Contractor is required to complete the "Supplementary Bid Proposal Credit Allowance for Use of Potable Water", located in the Proposal, in the event the City potable water becomes available for use during the course of the project.

Look



A-4 Method of Award (Revised 12/91)

The bids will be evaluated based on the following order of priority subject to availability of funds:

1. Total Base Bid
2. Total Base Bid plus Additive Alternate No. 1
3. Total Base Bid plus Additive Alternate No. 1 and No. 2
4. Total Base Bid plus Additive Alternate No. 1, No. 2, and No. 3

The City reserves the right to reject any or all bids, to waive irregularities and to accept the bid which, in the city's opinion, is most advantageous to the City and in the best interest of the public.

Explanation of Measurement and Payment

TOTAL BASE BID:

1. Demolition shall include all labor, equipment, etc., as required to completely demolish and remove from the job site all materials, items and equipment as shown in the plans, with the exception of removal of timber piling stubs below the mud line which shall be paid for separately. Contractor shall provide new 2" x 4" rubrails and minor timber framing at locations of catwalk removal to yield a fully finished deck appearance at said locations and payment for these rubrails and minor timber framing shall be made as part of demolition (no separate pay).

Look



In the event alternates are awarded in conjunction with the base bid, working time for completion of the project will be adjusted by the number of working days shown as follows for each alternate:

Additive Alternate #1: Add 20 Working Days  
Additive Alternate #2: Add 20 Working Days

PLUS, Indicate # of Days for each Additive Alternate/Deduct Alt.

Fill In # of Days,  
i.e., Working,  
Calendar  
for Total Base Bid

The following items are required to be submitted with the proposal:

1. 5% Bid Bond (Must reference Project Name as identified in the Proposal)  
(A Cashier's Check, certified check, money order or bank draft from any State or National Bank will also be acceptable.)
2. Disclosure of Interests Statement

A-6 Time of Completion/Liquidated Damages

The working time for completion of the Project will be KEYBOARD (Time of Completion WD? CD?). The Contractor shall commence work within ten (10) calendar days after receipt of written notice from the Director of Engineering Services or designee ("City Engineer") to proceed.

Fill-In Amount \$\$  
in BOLD Type  
Min. \$50/day  
Typ: \$100/day  
Max: \$500/day

For each calendar day that any work remains incomplete after the time specified in the Contract for completion of the work or after such time period as extended pursuant to other provisions of this Contract, KEYBOARD (Liquidated Damages Amt.) per calendar day will be assessed against the Contractor as liquidated damages. Said liquidated damages are not imposed as a penalty but as an estimate of the damages that the City will sustain from delay in completion of the work, which damages by their nature are not capable of precise proof. The Director of Engineering Services (City Engineer) may withhold and deduct from monies otherwise due the Contractor the amount of liquidated damages due the City.

Check Value of Work

A-7 Workers Compensation Insurance Coverage

If the Contractor's workers' compensation insurance coverage for its employees working on the Project is terminated or cancelled for any reason, and replacement workers' compensation insurance coverage meeting the requirements of this Contract is not in effect on the effective date of cancellation of the workers' compensation insurance coverage to be replaced, then any Contractor employee not covered by the required workers' compensation insurance coverage must not perform any work on the Project.

USE AS IS.  
DO NOT CHANGE

Furthermore, for each calendar day including and after the effective date of termination or cancellation of the Contractor's workers' compensation insurance coverage for its employees working on the Project until the date replacement workers' compensation insurance coverage, meeting the requirements of this Contract, is in effect for those Contractor employees, liquidated damages will be assessed against and paid by the Contractor at the highest daily rate elsewhere specified in this Contract. Such liquidated damages will accumulate without notice from the City Engineer to the Contractor and will be assessed and paid even if the permitted time to complete the Project has not expired.

In accordance with other requirements of this Contract, the Contractor shall not permit subcontractors or others to work on the Project unless all such individuals working on the Project are covered by workers' compensation insurance and unless the required documentation of such coverage has been provided to the Contractor and the City Engineer.

A-8 Faxed Proposals

Proposals faxed directly to the City will be considered non-responsive. Proposals must contain original signatures and guaranty and be submitted in accordance with Section B-2 of the General Provisions.

USE AS IS.  
DO NOT CHANGE

**A-9 Acknowledgment of Addenda**

The Contractor shall acknowledge receipt of all addenda received in the appropriate space provided in the proposal. Failure to do so will be interpreted as non-receipt. Since addenda can have significant impact on the proposal, failure to acknowledge receipt, and a subsequent interpretation of non-receipt, could have an adverse effect when determining the lowest responsible bidder.

Select one or the other, OR Insert Title if Different

**A-10 Wage Rates** (Revised 7/5/00)

Labor preference and wage rates for **KEYBOARD (Bldg)** or **Heavy Construction** **KEYBOARD** (For multiple wage rates, need statement that the higher rate will govern. If multiple wage rates, include the following statement; if not, delete) In case of conflict, Contractor shall use higher wage rate.

MUST

**Minimum Prevailing Wage Scales**

The Corpus Christi City Council has determined the general prevailing minimum hourly wage rates for Nueces County, Texas as set out in Part C. The Contractor and any subcontractor must not pay less than the specified wage rates to all laborers, workmen, and mechanics employed by them in the execution of the Contract. The Contractor or subcontractor shall forfeit sixty dollars (\$60.00) per calendar day, or portion thereof, for each laborer, workman, or mechanic employed, if such person is paid less than the specified rates for the classification of work performed. The Contractor and each subcontractor must keep an accurate record showing the names and classifications of all laborers, workmen, and mechanics employed by them in connection with the Project and showing the actual wages paid to each worker.

The Contractor will make bi-weekly certified payroll submittals to the City Engineer. The Contractor will also obtain copies of such certified payrolls from all subcontractors and others working on the Project. These documents will also be submitted to the City Engineer bi-weekly. (See section for Minority/Minority Business Enterprise Participation Policy for additional requirements concerning the proper form and content of the payroll submittals.)

One and one-half (1 1/2) times the specified hourly wage must be paid for all hours worked in excess of 40 hours in any one week and for all hours worked on Sundays or holidays. (See Section B-1-1, Definition of Terms, and Section B-7-6, Working Hours.)

**A-11 Cooperation with Public Agencies** (Revised 7/5/00)

The Contractor shall cooperate with all public and private agencies with facilities operating within the limits of the Project. The Contractor shall provide a forty-eight (48) hour notice to any applicable agency when work is anticipated to proceed in the vicinity of any facility by using the Texas One-Call System 1-800-245-4545, the Lone Star Notification Company at 1-800-669-8344, and the Southwestern Bell Locate Group at 1-800-828-5127. For the Contractor's convenience, the following telephone numbers are listed.

City Engineer	880-3500
Project Engineer	880-3500
A/E Project Engineer	KEYBOARD (enter full name)
	KEYBOARD (enter address, City/State/Zip)
	KEYBOARD (enter ph/fax #s)
Traffic Engineer	880-3540
Police Department	882-1911

ADD any others which might apply to your project, i.e.,

- Corps of Engineers
- TNRCC
- TWDB
- CITCO
- VALERO
- RTA

Water Division	857-1880	(880-3140 after hours)
Wastewater Services Division	857-1818	(880-3140 after hours)
Gas Division	885-6900	(885-6900 after hours)
Storm Water	857-1881	(880-3140 after hours)
Parks & Recreation	880-3461	
Solid Waste Services	857-1970	
Central Power & Light Co.	299-4833	(693-9444 after hours)
Southwestern Bell Telephone Co.	881-2511	(1-800-824-4424, after hours)
City Street Div. for Traffic Signal/Fiber Optic Locate	857-1946	857-1960
Cablevision	857-5000	(857-5060 after hours)
ACSI (Fiber Optic)	887-9200	(Pager 800-724-3624)
KMC (Fiber Optic)	813-1124	(Pager 888-204-1679)
ChoiceCom (Fiber Optic)	881-5767	(Pager 850-2981)
CAPROCK (Fiber Optic)	512/935-0958	(Mobile)
Brooks Fiber Optic (MAN)	972-753-4355	

**A-12 Maintenance of Services**

The Contractor shall take all precautions in protecting existing utilities, both above and below ground. The Drawings show as much information as can be reasonably obtained from existing as-built drawings, base maps, utility records, etc. and from as much field work as normally deemed necessary for the construction of this type of project with regard to the location and nature of underground utilities, etc. However, the accuracy and completeness of such information is not guaranteed. It is the Contractor's sole and complete responsibility to locate such underground features sufficiently in advance of his operations to preclude damaging the existing facilities. If the Contractor encounters utility services along the line of this work, it is his responsibility to maintain the services in continuous operation at his own expense.

MUST

In the event of damage to underground utilities, whether shown in the drawings, the Contractor shall make the necessary repairs to place the utilities back in service to construct the work as intended at no increase in the Contract price. All such repairs must conform to the requirements of the company or agency that owns the utilities.

Where existing sewers are encountered and are interfered with (i.e. broken, cut, etc.), flow must be maintained. Sewage or other liquid must be handled by the Contractor either by connection into other sewers or by temporary pumping to a satisfactory outlet, all with the approval of the City Engineer. Sewage or other liquid must not be pumped, bailed or flumed over the streets or ground surface and Contractor must pay for all fines and remediation that may result if sewage or other liquid contacts the streets or ground surface. It is also the Contractor's responsibility to make all necessary repairs, relocations and adjustments to the satisfaction of the City Engineer at no increase in the Contract price. Materials for repairs, adjustments or relocations of sewer service lines must be provided by the Contractor.

**A-13 Area Access and Traffic Control**

Optional, typically applies to street paving projects. Should be EDITED as required.

Sufficient traffic control measures must be used to assure a safe condition and to provide a minimum of inconvenience to motorists. All weather access must be provided to all residents and businesses at all times during construction. The Contractor must provide temporary driveways and/or roads of approved material during wet weather. The Contractor must maintain a stockpile on the Project site to meet the demands of inclement weather.

Optional, typically applies to paving projs. Should be EDITED as req'd.

The Contractor will be required to schedule his operations so as to cause minimum

adverse impact on the accessibility of adjoining properties. This may include, but is not limited to, working driveways in half widths, construction of temporary ramps, etc.

Must Use

The Contractor shall comply with the City of Corpus Christi's Uniform Barricading Standards and Practices as adopted by the City. Copies of this document are available through the City's Traffic Engineering Department. The Contractor shall secure the necessary permit from the City's Traffic Engineering Department.

All costs for traffic control are considered subsidiary; therefore, no direct payment will be made to Contractor.

A-14 Construction Equipment Spillage and Tracking

The Contractor shall keep the adjoining streets free of tracked and/or spilled materials going to or from the construction area. Hand labor and/or mechanical equipment must be used where necessary to keep these roadways clear of job-related materials. Such work must be completed without any increase in the Contract price.

Streets and curb line must be cleaned at the end of the work day or more frequently, if necessary, to prevent material from washing into the storm sewer system. No visible material that could be washed into storm sewer is allowed to remain on the Project site or adjoining streets.

Edit to fit your prj, if applicable; if not, state NOT USED

A-15 Excavation and Removals

The excavated areas behind curbs and adjacent to sidewalks and driveways must be filled with "clean" dirt. "Clean" dirt is defined as dirt that is capable of providing a good growth of grass when applied with seed/sod and fertilizer. The dirt must be free of debris, caliche, asphalt, concrete and any other material that detracts from its appearance or hampers the growth of grass.

All existing concrete and asphalt within the limits of the Project must be removed unless otherwise noted.

All necessary removals including but not limited to pipe, driveways, sidewalks, etc., are to be considered subsidiary to the bid item for "Street Excavation"; therefore, no direct payment will be made to Contractor.

Edit to fit your prj

A-16 Disposal/Salvage of Materials

Excess excavated material, broken asphalt, concrete, broken culverts and other unwanted material becomes the property of the Contractor and must be removed from the site by the Contractor. The cost of all hauling is considered subsidiary; therefore, no direct payment will be made to Contractor.

Optional/USE FOR ANY PROJECT WHICH WILL HAVE A CONSTRUCTION DURATION GREATER THAN 2 MOS.

A-17 Field Office

The Contractor must furnish the City Engineer or his representative with a field office at the construction site. The field office must contain at least 120 square feet of useable space. The field office must be air-conditioned and heated and must be furnished with an inclined table that measures at least 30" x 60" and two (2) chairs. The Contractor shall move the field office on the site as required by the City Engineer or his representative. The field office must be furnished with a telephone (with 24-hour per day answering service) and FAX machine paid for by the Contractor. There is no separate pay item for the field office.

ADD any special requirements for your project, OR reference spec by No. & Title

A-18 Schedule and Sequence of Construction

The Contractor shall submit to the City Engineer a work plan based only on working days. This plan must detail the schedule of work and must be submitted to the City Engineer at least three (3) working days prior to the pre-construction meeting.

The plan must indicate the schedule of the following work items:

1. Initial Schedule: Submit to the City Engineer three (3) days prior to the Pre-Construction Meeting an initial Construction Progress Schedule for review.
2. Items to Include: Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Identify the first work day of each week.
3. Submittal Dates: Indicate submittal dates required for all submittals.
4. Re-Submission: Revise and resubmit as required by the City Engineer.
5. Periodic Update: Submit Updated Construction Progress Schedule to show actual progress of each stage by percentage against initial Schedule.

MUST \*

#### A-19 Construction Staking

The drawings depict lines, slopes, grades, sections, measurements, bench marks, baselines, etc. that are normally required to construct a project of this nature.

The major controls and bench marks required for setting up a project, if not shown on the drawings, will be provided by the City Surveyor.

The City Engineer will furnish the Contractor with all lines, slopes and measurements for control of the work.

If, during construction, it is necessary to disturb or destroy a control point or bench mark, the Contractor shall provide the City Surveyor 48 hours notice so that alternate control points can be established by the City Surveyor as he deems necessary, at no cost to the Contractor. Control points or bench marks damaged as a result of the Contractor's negligence will be restored by the City Surveyor at the expense of the Contractor.

If, for whatever reason, it is necessary to deviate from proposed line and grade to properly execute the work, the Contractor shall obtain approval of the City Engineer prior to deviation. If, in the opinion of the City Engineer, the required deviation would necessitate a revision to the drawings, the Contractor shall provide supporting measurements as required for the City Engineer to revise the drawings. The Contractor shall tie in or reference all valves and manholes, both existing and proposed, for the purpose of adjusting valves and manholes at the completion of the paving process. Also, the City Engineer may require that the Contractor furnish a maximum of two (2) personnel for the purpose of assisting the measuring of the completed work.

#### A-20 Testing and Certification

All tests required under this item must be done by a recognized testing laboratory selected by the City Engineer. The cost of the laboratory testing will be borne by the City. In the event that any test fails, that test must be done over after corrective measures have been taken, and the cost of retesting will be borne by the Contractor and deducted from the payment to the Contractor.

The Contractor must provide all applicable certifications to the City Engineer.

EDIT for your project.  
Options:  
A/E Consultant  
City Engineer  
Contractor  
MUST \*

Depending where funds are coming from, i.e.

FAA  
CDBG  
CIP  
COP --- (sign not required)  
TWDB --- TWDB will furnish 1 -4x8 sign to be installed  
by Contractor in addition to City standard sign.

A-21 Project Signs

The Contractor must furnish and install ~~KEYBOARD~~(Number of Signs?) Project signs as indicated on the following drawings. (Attachment III) The signs must be installed before construction begins and will be maintained throughout the Project period by the Contractor. The location of the signs will be determined in the field by the City Engineer.

A-22 Minority/Minority Business Enterprise Participation Policy (Revised 10/98)

1. Policy

It is the policy of the City of Corpus Christi that maximum opportunity is afforded minorities, women and Minority Business Enterprises to participate in the performance of contracts awarded by the City of Corpus Christi in support of Equal Employment Opportunity goals and objectives of the Affirmative Action Policy Statement of the City dated October, 1989, and any amendments thereto. In accordance with such policy, the City has established goals, as stated herein, both for minority and female participation by trade and for Minority Business Enterprise.

2. Definitions

- a. Prime Contractor: Any person, firm, partnership, corporation, association or joint venture as herein provided which has been awarded a City contract.
- b. Subcontractor: Any named person, firm, partnership, corporation, association, or joint venture as herein identified as providing work, labor, services, supplies, equipment, materials or any combination of the foregoing under contract with a prime contractor on a City contract.
- c. Minority Business Enterprise: A business enterprise that is owned and controlled by one or more minority person(s). Minority persons include Blacks, Mexican-Americans and other persons of Hispanic origin, American Indians, Alaskan Natives, and Asians or Pacific Islanders. For the purposes of this section, women are also considered as minorities. Minority person(s) must collectively own, operate and/or actively manage, and share in payments from such an enterprise in the manner hereinafter set forth:
1. Owned
    - (a) For a sole proprietorship to be deemed a minority business enterprise, it must be owned by a minority person.
    - (b) For an enterprise doing business as a partnership, at least 51.0% of the assets or interest in the partnership property must be owned by one or more minority person(s).
    - (c) For an enterprise doing business as a corporation, at least 51.0% of the assets or interest in the corporate shares must be owned by one or more minority person(s).

2. Controlled

The primary power, direct or indirect, to manage a business enterprise rests with a minority person(s).

3. Share in Payments

MUST

Fill-In APPROVED %

A/E Consultant MUST advise on % Goal applicable to type of work in project.

Typ.  
45%

Typ.  
15%

Minority partners, proprietor or stockholders, of the enterprise, as the case may be, must be entitled to receive 51.0% or more of the total profits, bonuses, dividends, interest payments, commissions, consulting fees, rents, procurement, and subcontract payments, and any other monetary distribution paid by the business enterprise.

d. Minority: See definition under Minority Business Enterprise.

e. Female Owned Business Enterprise: A sole proprietorship that is owned and controlled by a woman, a partnership at least 51.0% of whose assets or partnership interests are owned by one or more women, or a corporation at least 51.0% of whose assets or interests in the corporate shares are owned by one or more women.

f. Joint Venture: A joint venture means an association of two or more persons, partnerships, corporations, or any combination thereof, founded to carry on a single business activity which is limited in scope and direction. The degree to which a joint venture may satisfy the stated MBE goal cannot exceed the proportionate interest of the MBE as a member of the joint venture in the work to be performed by the joint venture. For example, a joint venture which is to perform 50.0% of the contract work itself and in which a minority joint venture partner has a 50.0% interest, shall be deemed equivalent to having minority participation in 25.0% of the work. Minority members of the joint venture must have either financial, managerial, or technical skills in the work to be performed by the joint venture.

3. Goals

a. The goals for participation by minorities and Minority Business Enterprises expressed in percentage terms for the Contractor's aggregate work force on all construction work for the Contract award are as follows:

Minority Participation (Percent)	Minority Business Enterprise Participation (Percent)
<u>KEYBOARD (%) %</u>	<u>KEYBOARD (%) %</u>

b. These goals are applicable to all the construction work (regardless of federal participation) performed in the Contract, including approved change orders. The hours of minority employment must be substantially uniform throughout the length of the Contract and in each trade. The transfer of minority employees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's percentage is prohibited.

4. Compliance

a. Upon completion of the Project, a final breakdown of MBE participation, substantiated by copies of paid invoices, shall be submitted by the Contractor to the City Engineer.

b. The Contractor shall make bi-weekly payroll submittals to the City Engineer. The Contractor is to indicate the percent of minority and female participation, by trade, which has been utilized on the Project. Along with the request for final payment on the Project, the Contractor will indicate, in writing, the overall participation in these areas which

MUST



Use ONLY where NEW BLDG.  
is being constructed.

have been achieved. The City Engineer may withhold monthly or final payments to the Contractor for failure to submit bi-weekly payrolls in a timely fashion or to submit overall participation information as required.

**A-23 Inspection Required** (Revised 7/5/00)

The Contractor shall assure the appropriate building inspections by the Building Inspection Division at the various intervals of work for which a permit is required and to assure a final inspection after the building is completed and ready for occupancy. Contractor must obtain the Certificate of Occupancy, when applicable. Section B-6-2 of the General Provisions is hereby amended in that the Contractor must pay all fees and charges levied by the City's Building Inspection Department, and all other City fees, including water/wastewater meter fees and tap fees as required by City.

**A-24 Surety Bonds**

Paragraph two (2) of Section B-3-4 of the General Provisions is changed to read as follows:

MUST \*

"No surety will be accepted by the City from any Surety Company who is now in default or delinquent on any bonds or who has an interest in any litigation against the City. All bonds must be issued by an approved Surety Company authorized to do business in the State of Texas. If performance and payment bonds are in an amount in excess of ten percent (10%) of the Surety Company's capital and surplus, the Surety Company shall provide certification satisfactory to the City Attorney that the Surety Company has reinsured the portion of the bond amount that exceeds ten percent (10%) of the Surety Company's capital and surplus with reinsurer(s) authorized to do business in the State of Texas. The amount of the bond reinsured by any reinsurer may not exceed ten percent (10%) of the reinsurer's capital and surplus. For purposes of this section, the amount of allowed capital and surplus will be verified through the State Board of Insurance as of the date of the last annual statutory financial statement of the Surety Company or reinsurer authorized and admitted to do business in the State of Texas. The Surety shall designate an agent who is a resident of Nueces County, Texas. Each bond must be executed by the Contractor and the Surety. For contracts in excess of \$100,000 the bond must be executed by a Surety company that is certified by the United States Secretary of the Treasury or must obtain reinsurance for any liability in excess of \$100,000 from a reinsurer that is certified by the United States Secretary of the Treasury and that meets all the above requirements. The insurer or reinsurer must be listed in the Federal Register as holding certificates of authority on the date the bond was issued."

**A-25 Sales Tax Exemption** (NOT USED)

~~Section B-6-22, Tax Exemption Provision, is deleted in its entirety and the following substituted in lieu thereof:~~

~~Contracts for improvements to real property awarded by the City of Corpus Christi do not qualify for exemptions of Sales, Excise, and Use Taxes unless the Contractor elects to operate under a separated contract as defined by Section 3.291 of Chapter 3, Tax Administration of Title 34, Public Finance of the Texas Administrative Code, or such other rules or regulations as may be promulgated by the Comptroller of Public Accounts of Texas.~~

~~If the Contractor elects to operate under a separated contract, he shall:~~

- ~~1. Obtain the necessary sales tax permits from the State Comptroller.~~
- ~~2. Identify in the appropriate space on the "Statement of Materials and Other Charges" in the proposal form the cost of materials physically incorporated into the Project.~~
- ~~3. Provide resale certificates to suppliers.~~
- ~~4. Provide the City with copies of material invoices to substantiate the proposal value of materials.~~

~~If the Contractor does not elect to operate under a separated contract, he must pay for all Sales, Excise, and Use Taxes applicable to this Project.~~

~~Subcontractors are eligible for sales tax exemptions if the subcontractor also complies with the above requirements. The Contractor must issue a resale certificate to the subcontractor and the subcontractor, in turn, issues a resale certificate to his supplier.~~



A-26 Supplemental Insurance Requirements

For each insurance coverage provided in accordance with Section B-6-11 of the Contract, the Contractor shall obtain an endorsement to the applicable insurance policy, signed by the insurer, stating:

In the event of cancellation or material change that reduces or restricts the insurance afforded by this coverage part, each insurer covenants to mail prior written notice of cancellation or material change to:

1. Name: City of Corpus Christi  
Engineering Services Department  
Attn: Contract Administrator
2. Address: P.O. Box 9277  
Corpus Christi, Texas 78469-9277
3. Number of days advance notice: 30

The Contractor shall provide to the City Engineer the signed endorsements, or copies thereof certified by the insurer, within thirty (30) calendar days after the date the City Engineer requests that the Contractor sign the Contract documents.

Within thirty (30) calendar days after the date the City Engineer requests that the Contractor sign the Contract documents, the Contractor shall provide the City Engineer with a certificate of insurance certifying that the Contractor provides worker's compensation insurance coverage for all employees of the Contractor employed on the Project described in the Contract.

For each insurance coverage provided in accordance with Section B-6-11 of the Contract, the Contractor shall obtain an endorsement to the applicable insurance policy, signed by the insurer, stating that the City is an additional insured under the insurance policy. The City need not be named as additional insured on Worker's Compensation coverage.

For contractual liability insurance coverage obtained in accordance with Section B-6-11 (a) of the Contract, the Contractor shall obtain an endorsement to this coverage stating:

Use BUILDERS RISK only when Building Construction is being done.

INSTALLATION FLOATER only when something is being purchaed & installed, NOT constructed.

Equipment  
Pumps  
A/C

Not waterlines/manholes

Contractor agrees to indemnify, save harmless and defend the City, its agents, servants, and employees, and each of them against and hold it and them harmless from any and all lawsuits, claims, demands, liabilities, losses and expenses, including court costs and attorneys' fees, for or on account of any injury to any person, or any death at any time resulting from such injury, or any damage to any property, which may arise or which may be alleged to have arisen out of or in connection with the work covered by this Contract. The foregoing indemnity shall apply except if such injury, death or damage is caused directly by the negligence or other fault of the City, its agents, servants, or employees or any person indemnified hereunder.

**A-27 Responsibility for Damage Claims**

Paragraph (a) General Liability of Section B-6-11 of the General Provisions is amended to include:

Contractor must provide builder's risk insurance coverage for the term of the Contract up to and including the date the City finally accepts the Project or work. Builder's risk coverage must be an "All Risk" form. Contractor must pay all costs necessary to procure such builder's risk insurance coverage, including any deductible. The City must be named additional insured on any policies providing such insurance coverage.

**A-28 Considerations for Contract Award and Execution**

To allow the City Engineer to determine that the bidder is able to perform its obligations under the proposed contract, then prior to award, the City Engineer may require a bidder to provide documentation concerning:

1. Whether any liens have been filed against bidder for either failure to pay for services or materials supplied against any of its projects begun within the preceding two (2) years. The bidder shall specify the name and address of the party holding the lien, the amount of the lien, the basis for the lien claim, and the date of the release of the lien. If any such lien has not been released, the bidder shall state why the claim has not been paid; and
2. Whether there are any outstanding unpaid claims against bidder for services or materials supplied which relate to any of its projects begun within the preceding two (2) years. The bidder shall specify the name and address of the claimant, the amount of the claim, the basis for the claim, and an explanation why the claim has not been paid.

A bidder may also be required to supply construction references and a financial statement, prepared no later than ninety (90) days prior to the City Engineer's request, signed and dated by the bidder's owner, president or other authorized party, specifying all current assets and liabilities.

**A-29 Contractor's Field Administration Staff**

The Contractor shall employ for this Project, as its field administration staff, superintendents and foremen who are careful and competent and acceptable to the City Engineer.

The criteria upon which the City Engineer makes this determination may include the following:

1. The superintendent must have at least five (5) years experience in the day-to-day field management and oversight of projects of a similar size and complexity

5-Yrs Typical; if more experience needed, EDIT.

to this Project. This experience must include, but is not limited to, scheduling of manpower and materials, structural steel erection, masonry, safety, coordination of subcontractors, and familiarity with the architectural submittal process, federal and state wage rate requirements, and contract close-out procedures.

5-Yrs. Typical; if more experience is needed, EDIT.

2. The foreman must have at least five (5) years experience in oversight and management of the work of various subcontractors and crafts. If the scope of the Project is such that a foreman is not required, the Contractor's superintendent shall assume the responsibilities of a foreman.

Documentation concerning these matters will be reviewed by the City Engineer. The Contractor's field administration staff, and any subsequent substitutions or replacements thereto, must be approved by the City Engineer in writing prior to such superintendent or foreman assuming responsibilities on the Project.

Such written approval of field administration staff is a prerequisite to the City Engineer's obligation to execute a contract for this Project. If such approval is not obtained, the award may be rescinded. Further, such written approval is also necessary prior to a change in field administration staff during the term of this Contract. If the Contractor fails to obtain prior written approval of the City Engineer concerning any substitutions or replacements in its field administration staff for this Project during the term of the Contract, such a failure constitutes a basis to annul the Contract pursuant to section B-7-13.

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**A-30 Amended "Consideration of Contract" Requirements**

Under "General Provisions and Requirements for Municipal Construction Contracts" Section B-3-1 Consideration of Contract add the following text:

Within five (5) working days following the public opening and reading of the proposals, the three (3) apparent lowest bidders (based on the Base Bid only) must submit to the City Engineer the following information:

1. A list of the major components of the work;
2. A list of the products to be incorporated into the Project;
3. A schedule of values which specifies estimates of the cost for each major component of the work;
4. A schedule of anticipated monthly payments for the Project duration.
5. The names and addresses of MBE firms that will participate in the Contract, along with a description of the work and dollar amount for each firm; and substantiation, either through appropriate certifications by federal agencies or signed affidavits from the MBE firms, that such MBE firms meet the guidelines contained herein. Similar substantiation will be required if the Contractor is an MBE. If the responses do not clearly show that MBE participation will meet the requirements above, the bidder must clearly demonstrate, to the satisfaction of the City Engineer, that a good faith effort has, in fact, been made to meet said requirements but that meeting such requirements is not reasonably possible.
6. A list of subcontractors that will be working on the Project. This list may contain more than one subcontractor for major components of the work if the Contractor has not completed his evaluation of which subcontractor will perform the work.

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The City Engineer retains the right to approve all subcontractors that will perform work on the Project. The Contractor shall obtain written approval by the City Engineer of all of its subcontractors prior to beginning work on the Project. If the City Engineer does not approve all proposed subcontractors, it may rescind the Contract award.

In the event that a subcontractor previously listed and approved is sought to be substituted for or replaced during the term of the Contract, then the City Engineer retains the right to approve any substitute or replacement subcontractor prior to its participation in the Project. Such approval will not be given if the replacement of the subcontractor will result in an increase in the Contract price. Failure of the Contractor to comply with this provision constitutes a basis upon which to annul the Contract pursuant to Section B-7-13;

- 7. A preliminary progress schedule indicating relationships between the major components of the work. The final progress schedule must be submitted to the City Engineer at the pre-construction conference;
- 8. Documentation required pursuant to the Special Provisions A-28 and A-29 concerning Considerations for Contract Award and Execution and the Contractor's Field Administration Staff.
- 9. Documentation as required by Special Provision A-35-K, if applicable.
- 10. Within five (5) days following bid opening, submit in letter form, information identifying type of entity and state, i.e., Texas (or other state) Corporation or Partnership, and name(s) and Title(s) of individual(s) authorized to execute contracts on behalf of said entity.

ADD any additional submittal requirements needed prior to award.

A-31 Amended Policy on Extra Work and Change Orders

Under "General Provisions and Requirements for Municipal Construction Contracts" B-8-5 Policy on Extra Work and Change Orders the present text is deleted and replaced with the following:

Contractor acknowledges that the City has no obligation to pay for any extra work for which a change order has not been signed by the Director of Engineering Services or his designee. The Contractor also acknowledges that the City Engineer may authorize change orders which do not exceed \$25,000.00. The Contractor acknowledges that any change orders in an amount in excess of \$25,000.00 must also be approved by the City Council.

A-32 Amended "Execution of Contract" Requirements

Under "General Provisions and Requirements for Municipal Construction Contracts" B-3-5 Execution of Contract add the following:

The award of the Contract may be rescinded at any time prior to the date the City Engineer delivers a contract to the Contractor which bears the signatures of the City Manager, City Secretary, and City Attorney, or their authorized designees. Contractor has no cause of action of any kind, including for breach of contract, against the City, nor is the City obligated to perform under the Contract, until the date the City Engineer delivers the signed Contracts to the Contractor.

A-33 Conditions of Work

Each bidder must familiarize himself fully with the conditions relating to the

completion of the Project. Failure to do so will not excuse a bidder of his obligation to carry out the provisions of this Contract. Contractor is reminded to attend the Pre-Bid Meeting referred to in Special Provision A-1.

**A-34 Precedence of Contract Documents**

In case of conflict in the Contract documents, first precedence will be given to addenda issued during the bidding phase of the Project, second precedence will be given to the Special Provisions, third precedence will be given to the construction plans, fourth precedence will be given to the Standard Specifications and the General Provisions will be given last precedence. In the event of a conflict between any of the Standard Specifications with any other referenced specifications, such as the Texas Department of Public Transportation Standard Specifications for Highways, Streets and Bridges, ASTM specifications, etc., the precedence will be given to addenda, Special Provisions and Supplemental Special Provisions (if applicable), construction plans, referenced specifications, Standard Specifications, and General Provisions, in that order.

**A-35 City Water Facilities: Special Requirements**

**A. Visitor/Contractor Orientation**

Prior to performing work at any City water facility, the Contractor, his subcontractors, and each of their employees must have on their person a valid card certifying their prior attendance at a Visitor/Contractor Safety Orientation Program conducted by the City Water Department Personnel. A Visitor/Contractor Safety Orientation Program will be offered by authorized City Water Department personnel for those persons who do not have such a card, and who desire to perform any work within any City water facility. For additional information refer to **Attachment 1.**

**B. Operation of City-Owned Equipment**

**The Contractor shall not start, operate, or stop any pump, motor, valve, equipment, switch, breaker, control, or any other item related to City water facility at any time. All such items must be operated by an operator or other authorized maintenance employee of the City Water Department.**

**C. Protection of Water Quality**

The City must deliver water of drinking quality to its customers at all times. The Contractor shall protect the quality of the water in the job site and shall coordinate its work with the City Water Department to protect the quality of the water.

**D. Conformity with ANSI/NSF Standard 61**

All materials and equipment used in the repair, reassembly, transportation, reinstallation, and inspection of pumps, or any other items, which could come into contact with potable water, must conform to American National Standards Institute/National Sanitation Foundation (ANSI/NSF) Standard 61 as described in the Standard Specifications.

**Such materials include all solvents, cleaners, lubricants, gaskets, thread compounds, coatings, or hydraulic equipment. These items must not be used unless they conform with**

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Use ONLY when project is AT a City Water Fac., i.e., O.N. Stevens Plant, Holly Pump Station, River Pump Station, etc.

**ANSI/NSF Standard 61 and unless such items are inspected on the site by authorized City personnel immediately prior to use.**

The Contractor shall provide the Engineer with copies of written proof of ANSI/NSF Standard 61 approval for all materials which could come into contact with potable water.

**E. Handling and Disposal of Trash**

All trash generated by the Contractor or his employees, agents, or subcontractors, must be contained at all times at the water facility site. Blowing trash will not be allowed. The Contractor shall keep work areas clean at all times and remove all trash daily.

**CONTRACTOR'S ON-SITE PREPARATION**

**F. Contractor's personnel must wear colored uniform overalls other than orange, blue, or white. Each employee uniform must provide company name and individual employee identification.**

**G. Contractor shall provide telephones for Contractor personnel. Plant telephones are not available for Contractor use.**

**H. Working hours will be 7:00 A.M. to 5:00 P.M., Monday thru Friday.**

**I. Contractor must not use any City facility restrooms. Contractor must provide own sanitary facilities.**

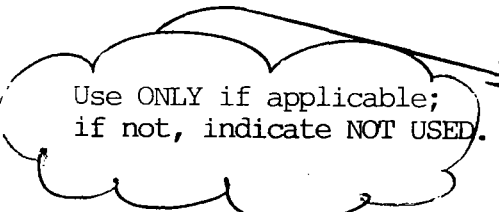
**J. All Contractor vehicles must be parked at designated site, as designated by City Water Department staff. All Contractor vehicles must be clearly labeled with company name. No private employee vehicles are allowed at O. N. Stevens Water Treatment Plant. All personnel must be in company vehicles. During working hours, contractor employees must not leave the designated construction area nor wander through any buildings other than for required work or as directed by City Water Department personnel during emergency evacuation.**

**K. Contractor Qualifications - SCADA (SUPERVISORY CONTROL AND DATA ACQUISITION)**

Any work to the computer-based monitoring and control system must be performed only by qualified technical and supervisory personnel, as determined by meeting the qualifications 1 thru 9 below. This work includes, but is not limited to, modifications, additions, changes, selections, furnishing, installing, connecting, programming, customizing, debugging, calibrating, or placing in operation all hardware and/or software specified or required by these specifications.

The Contractor or his subcontractor proposing to perform the SCADA work must be able to demonstrate the following:

1. He is regularly engaged in the computer-based monitoring and control system business, preferably as applied to the municipal water and wastewater industry.
2. He has performed work on systems of comparable size, type, and complexity as required in this Contract on at least three prior projects.



Use ONLY if applicable;  
if not, indicate NOT USED.

3. He has been actively engaged in the type of work specified herein for at least 5 years.
4. He employs a Registered Professional Engineer, a Control Systems Engineer, or an Electrical Engineer to supervise or perform the work required by this specifications.
5. He employs personnel on this Project who have successfully completed a manufacturer's training course in configuring and implementing the specific computers, RTUS's, and software proposed for the Contract.
6. He maintains a permanent, fully staffed and equipped service facility within 400 miles of the Project site to maintain, repair, calibrate, and program the systems specified herein.
7. He shall furnish equipment which is the product of one manufacturer to the maximum practical extent. Where this is not practical, all equipment of a given type will be the product of one manufacturer.
8. Prior performance at the O. N. Stevens Water Treatment Plant will be used in evaluating which Contractor or subcontractor programs the new work for this Project.
9. The Contractor shall produce all filled-out programming blocks required to show the programming as needed and required, to add these two systems to the existing City SCADA system. Attached is an example of the required programming blocks which the City requires to be filled in and given to the City Engineer with all changes made during the programming phase. The attached sheet is an example and is not intended to show all of the required sheets. The Contractor will provide all programming blocks used.

L. Trenching Requirements

All trenching for this project at the O. N. Stevens Water Treatment Plant shall be performed using a backhoe or hand-digging due to the number of existing underground obstructions. No trenching machines shall be allowed on the project.

A-36 Other Submittals

1. Shop Drawing Submittal: The Contractor shall follow the procedure outlined below when processing Shop Drawing submittals:
  - a. Quantity: Contractor shall submit number required by the City to the City Engineer or his designated representative.
  - b. Reproducibles: In addition to the required copies, the Contractor shall also submit one (1) reproducible transparency for all shop drawings.
  - c. Submittal Transmittal Forms: Contractor shall use the Submittal Transmittal Form attached at the end of this Section; and sequentially number each transmittal form. Resubmittals must have the original submittal number with an alphabetic suffix. Contractor must identify the Contractor, the Subcontractor or supplier; pertinent Drawing sheet and detail number(s), and specification Section number, as appropriate, on each submittal form.
  - d. Contractor's Stamp: Contractor must apply Contractor's stamp, appropriately signed or initialed, which certifies that review, verification of Products required, field dimensions, adjacent

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construction work, and coordination of information, is all in accordance with the requirements of the Project and Contract documents.

- e. Scheduling: Contractor must schedule the submittals to expedite the Project, and deliver to the City Engineer for approval, and coordinate the submission of related items.
- f. Marking: Contractor must mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information unique to this Project.
- g. Variations: Contractor must identify any proposed variations from the Contract documents and any Product or system limitations which may be detrimental to successful performance of the completed work.
- h. Space Requirements: Contractor must provide adequate space for Contractor and Engineer review stamps on all submittal forms.
- i. Resubmittals: Contractor must revise and resubmit submittals as required by City Engineer and clearly identify all changes made since previous submittal.
- j. Distribution: Contractor must distribute copies of reviewed submittals to subcontractors and suppliers and instruct subcontractors and suppliers to promptly report, thru Contractor, any inability to comply with provisions.

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- 2. Samples: The Contractor must submit samples of finishes from the full range of manufacturers' standard colors, textures, and patterns for City Engineer's selection.

3. Test and Repair Report

When specified in the Technical Specifications Section, Contractor must submit three (3) copies of all shop test data, and repair report, and all on-site test data within the specified time to the City Engineer for approval. Otherwise, the related equipment will not be approved for use on the project.

A-37 Amended "Arrangement and Charge for Water Furnished by the City"

Under "General Provisions and Requirements for Municipal Construction Contracts", B-6-15 Arrangement and Charge for Water Furnished by the City, add the following:

"The Contractor must comply with the City of Corpus Christi's Water Conservation and Drought Contingency Plan as amended (the "Plan"). This includes implementing water conservation measures established for changing conditions. The City Engineer will provide a copy of the Plan to Contractor at the pre-construction meeting. The Contractor will keep a copy of the Plan on the Project site throughout construction."

A-38 Worker's Compensation Coverage for Building or Construction Projects for Government Entities

The requirements of "Notice to Contractors 'B'" are incorporated by reference in this Special Provision.

A-39 Certificate of Occupancy and Final Acceptance

ADD any additional submittal requirements necessary for the proj, OR, indicate Tech Spec by No.

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The issuance of a certificate of occupancy for improvements does not constitute final acceptance of the improvements under General Provision B-8-9.

**A-40 Amendment to Section B-8-6: Partial Estimates**

General Provisions and Requirements for Municipal Construction Contracts Section B-8-6: Partial Estimates is amended to provide that approximate estimates from which partial payments will be calculated will not include the net invoice value of acceptable, non-perishable materials delivered to the Project worksite unless the Contractor provides the City Engineer with documents, satisfactory to the City Engineer, that show that the material supplier has been paid for the materials delivered to the Project worksite.

Optional, use where applicable

**A-41 Ozone Advisory**

Priming and hot-mix paving operations must not be conducted on days for which an ozone advisory has been issued, except for repairs. The City Engineer will notify Contractor about ozone alert. If a delay such as this is experienced, the day will not be counted as a work day and the Contractor will be compensated at the unit price indicated in the proposal.

**A-42 OSHA Rules & Regulations**

It is the responsibility of the Contractor(s) to adhere to all applicable OSHA rules and regulations while performing any and all City-related projects and or jobs.

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**A-43 Amended Indemnification & Hold Harmless**

Under "General Provisions and Requirements for Municipal Construction Contracts" B-6-21 Indemnification & Hold Harmless, text is deleted in its entirety and the following is substituted in lieu thereof:

The Contractor shall hold the City, its officials, employees, attorneys, and agents harmless and shall indemnify the City, its officials, employees, attorneys, and agents from any and all damages, injury or liability whatsoever from an act or omission of the contractor, or any subcontractor, supplier, materialman, or their officials, employees, agents, or consultants, or any work done under the contract or in connection therewith by the contractor, or any subcontractor, supplier, materialman, or their officials, employees, agents, or consultants.

The contractor shall hold the City, its officials, employees, attorneys, and agents harmless and shall indemnify the City, its officials, employees, attorneys, and agents from any and all damages, injury, or liability whatsoever from a negligent act or omission of the city, its officials, employees, attorneys, and agents that directly or indirectly causes injury to an employee of the contractor, or any subcontractor, supplier or materialman.

**A-44 Change Orders**

Should a change order(s) be required by the engineer, Contractor shall furnish the engineer a complete breakdown as to all prices charged for work of the change order (unit prices, hourly rates, sub-contractor's costs and breakdowns, cost of materials and equipment, wage rates, etc.). This breakdown information shall be submitted by contractor as a basis for the price of the change order.

**A-45 As-Built Dimensions and Drawings (7/5/00)**

- (a) Contractor shall make appropriate daily measurements of facilities constructed and keep accurate records of location (horizontal and vertical) of all facilities.
- (b) Upon completion of each facility, the Contractor shall furnish Owner with one set of direct prints, marked with red pencil, to show as-built dimensions and locations of all work constructed. As a minimum, the final drawings shall include the following:
  - (1) Horizontal and vertical dimensions due to substitutions/field changes.
  - (2) Changes in equipment and dimensions due to substitutions.
  - (3) "Nameplate" data on all installed equipment.
  - (4) Deletions, additions, and changes to scope of work.
  - (5) Any other changes made.

**A-46 Disposal of Highly Chlorinated water (7/5/00)**

The Contractor shall be responsible for the disposal of water used for testing, disinfection and line flushing in an approved manner. Contaminants in the water, particularly high levels of chlorine, will be used for disinfection, and may exceed the permissible limits for discharge into wetlands or environmentally sensitive areas. These are regulated by numerous agencies such as TNRCC, EPA, etc. It will be the Contractor's responsibility to comply with the requirements of all regulatory agencies in the disposal of all water used in the project. The methods of disposal shall be submitted to the City for approval. There shall be no separate pay for disposal of highly chlorinated water. Contractor shall not use the City's sanitary sewer system for disposal of contaminated water.

**A-47 Pre-Construction Exploratory Excavations (7/5/00)**

Prior to any construction whatever on the project, Contractor shall excavate and expose all existing pipelines of the project that cross within 20-feet of proposed pipelines of the project and Contractor shall survey the exact vertical and horizontal location of each crossing and potentially conflicting pipeline.

For existing pipelines which parallel and are within ten feet (10') of proposed pipelines of the project, Contractor shall excavate and expose said existing pipelines at a maximum of 300-feet O.C. and Contractor shall survey the accurate horizontal and vertical locations of said parallel pipelines at 300-foot maximum O.C.

Contractor shall then prepare a report and submit it to the City for approval indicating the Owner of pipelines excavated and surveyed, as well as the approximate station thereof, distance to the pavement centerline and elevations of the top of existing pipelines.

**Contractor shall perform no construction work on the project until all exploratory excavations have been made in their entirety, the results thereof reported to the Engineer and until Contractor receives Engineer's approval of report.**

Exploratory excavations shall be paid for on a lump sum basis. Any pavement repair associated with exploratory excavations shall be paid for according to the established unit price of pavement patching. Contractor shall provide all his own survey work effort (no separate pay) for exploratory excavations.

**A-48 Overhead Electrical Wires** (7/5/00)

Contractor shall comply with all OSHA safety requirements with regard to proximity of construction equipment beneath overhead electrical wires. There are many overhead wires crossing the construction route and along the construction route. Contractor shall use all due diligence, precautions, etc., to ensure that adequate safety is provided for all of his employees and operators of equipment and with regard to ensuring that no damage to existing overhead electrical wires or facilities occurs.

Contractor shall coordinate his work with CP&L and inform CP&L of his construction schedule with regard to said overhead lines.

Some overhead lines are shown in the construction plans, while others are not. It shall be the Contractor's sole responsibility to provide for adequate safety with regard to overhead lines whether shown in the plans or not.

**A-49 Amended "Maintenance Guaranty"** (8/24/00)

Under "General Provisions and Requirements for Municipal Construction Contracts", B-8-11 Maintenance Guaranty, add the following:

"The Contractor's guarantee is a separate, additional remedy available to benefit the City of Corpus Christi. Neither the guarantee nor expiration of the guarantee period will operate to reduce, release, or relinquish any rights or remedies available to the City of Corpus Christi for any claims or causes of action against the Contractor or any other individual or entity."



*use only when A35 is used.*

ATTACHMENT I

O. N. STEVENS WATER PLANT VISITOR/CONTRACTOR ON-SITE PERMIT

## O.N. STEVENS WATER TREATMENT PLANT VISITOR/CONTRACTOR ON-SITE PERMIT

As a visitor and/or contractor you will be required to adhere to our operational safety policies at all times while at the Plant. We require that you carefully read and familiarize yourself with the following information. **A visitor is defined as any person or student on a plant tour, consultant engineers, salespersons, other department city employees, fire fighters conducting training or testing activities, or any other person not employed by the City permanently assigned to the plant. A contractor is defined as any person employed by a construction firm under contractual agreement with the city to perform construction, maintenance, or service work.** Emergency response personnel responding to an emergency in the plant are exempt from reading this permit.

### FACILITY SECURITY

- > **All visitors and/or contractors, upon arrival, must register with the security guard at the main plant entrance.** Prior to leaving the Plant, you must be signed out as well. This must be done each time you enter or leave the Plant. The purpose of this is maintain an accurate roster of all persons in the plant at all times. This list will be turned over to the city police and risk management during an emergency.
- > All **visitors** shall wear a numbered **visitor's badge** issued by the guard upon entry to the plant. All **contractors** shall wear a numbered **contractor's badge** issued by the guard upon entry to the plant. Badges shall be worn where they can be readily seen. All badges shall be returned to the guard when leaving the plant.
- > **Visitors and contractors shall park their vehicles in the areas designated by the guard.** Contractors shall shuttle their employees from this designated parking area to their work site. Late arrivals shall walk to their work site. Only vehicles properly marked with company name shall be allowed in the work site location. Company vehicles shall have prior approval from the Water Production Superintendent before being allowed in the work area. City officials (elected and top management) and law enforcement officers are exempted from marking their vehicles.

**Non-plant vehicles shall not drive thru the canopy area adjacent to the Chemical Building.** This area has several blind spots and is an area with heavy pedestrian and chemical delivery traffic. Contractors shall drive along the back side of the plant to access any work area located west of the Chemical Building. The area map shows the route that shall be taken.

- > Please obey all posted traffic and informational signs. Unless otherwise posted, the **speed limit within the plant is 10 mph.**

- > Visitors and/or contractors will be escorted at all times while at the Plant unless authorized in writing by the Water Production Superintendent. If authorized to proceed unaccompanied, you will strictly limit yourself to only those areas specified in the written authorization.
- > **Contractors and visitors shall not operate any valve, pump, motor, or equipment.**

#### **USE OF PLANT FACILITIES**

- > The plant has a limited quantity of **telephones intended for plant use only**. Use of plant telephones is prohibited unless permission is given by the Water Production Superintendent on a case by case basis. Contractors are required by the contract specifications to provide their own telephones.
- > The **photocopying machine located at the plant is intended for plant use only**. Use of the photocopier is prohibited unless permission is given by the Water Production Superintendent on a case by case basis.
- > The restroom facilities located in the plant are intended for plant employee and visitor use only. **Contractors are required by contract specifications to furnish their employees with portable restroom facilities located near their field offices or work areas**. Contractors working inside the buildings may use the plant restroom facilities.
- > Contractors coming inside to meet with plant operations or maintenance personnel shall insure not to track mud inside the building.

#### **SMOKING**

- > **City ordinance prohibits smoking in public building**, city owned buildings, and in city vehicles. Smoking is prohibited in all buildings within the plant and in all water treatment areas.
- > There are two areas designated as smoking areas for office visitors: Outside the rear door of the Chemical Building and outside the East door of the Filter Building. Smoking is permitted inside contractors' vehicles. Cigarette butts shall be properly disposed of in proper receptacles. Cigarette butts shall not be disposed of on the plant grounds.
- > The Contractor may request a special area near his work site, but not inside his work area, to be designated as a smoking area for the duration of the his project. The Water Production Superintendent will allow smoking in this area as long as the cigarette butts are properly disposed of.



### **FOOD AND BEVERAGES**

- > The possession and/or consumption of food and/or beverages is prohibited outside of the designated "lunch room" in the Chemical Building, Laboratory Building, and Filter Building. These areas are limited in size and are reserved for plant employees and their guests only.
- > There are no food vending facilities within the plant. Contractors must either bring in their lunches or travel outside the plant for lunch. **Contractors may lunch in their field offices, private vehicles, company vehicles** or in a special area designated by the Water Production Superintendent.
- > Trash shall be properly disposed of. Contractors shall be responsible for insuring that their employees are properly disposing of their trash. Contractors shall be responsible for disposing of their field office trash on a daily basis.
- > **Possession of illegal drugs or alcohol are grounds for immediate expulsion** from the Plant. Persons expelled from the Plant due to possession of drugs may be refused reentry into the Plant.

### **SAFETY EQUIPMENT**

- > **All visitors and contractors shall wear hard hats** when visiting or working at the plant. Hard hats are optional in the offices, lab, control room, and the crew ready room. Hard hats will be issued by the guard only to visitors of the plant manager. The plant does not provide hard hats to contractors or visitors of contractors. Contractors shall furnish hard hats to their employees and their visitors.
- > Contractors shall issue hard hats, safety goggles, hearing protection and other safety equipment as required to work in the facility. Construction crews are required to wear safety shoes. Visitors and consultants that are going to be primarily in the office area are not required to wear safety shoes.
- > **The contractor's construction crew shall wear uniforms with the company's name.** The contractor has the color option other than blue, white, or orange which are reserved for the plant employees. The uniforms may be long sleeve shirts and jeans or overalls. Contractors that are required to wear orange or green safety vests by their company may do so as long as the vests have company identification on them.

### **CONFINED SPACE ENTRY PERMIT**

- > No one shall enter a confined space without first obtaining a "**Confined Space Entry Permit**" from either the Maintenance Superintendent or the Safety Coordinator. Persons entering the confined space shall be properly equipped, backed-up, and supported by the required number of personnel.

- > A confined space is defined as any space subject to but not limited to the following conditions:
  - >An area not normally occupied by personnel.
  - >An area with limited access.
  - >An area with limited air circulation.
- > Contractors shall refer to the Federal Register, 29 CFR Parts 1910.146 for the complete rules and regulations.

#### **EMERGENCIES**

- > The Plant has a specific and detailed Emergency Contingency Plan covering fires, explosions, release(s) of hazardous materials to the air or to the ground, injured or ill personnel requiring immediate medical assistance, intrusion of unauthorized persons, any other event(s) not listed which present an imminent hazard to personnel, equipment, facilities, or the environment.
- > Should you observe any of the above conditions, immediately notify the nearest Plant personnel and follow their instructions regarding safety actions to take.
- > During an emergency, **the Water Production Superintendent is the "On Scene Incident Commander"** until the first uniformed public safety officer, either Police or Fire, arrives.
- > In case of an emergency, the assembly location for those working near the chemical building shall be the Ready Room located in the Chemical Building. The office space and the Ready Room of the Chemical Building are air conditioned with a positive pressurization system. For those persons working in areas that are not able to get to the Ready Room because of the wind direction, shall assemble in the their field office, the Guard House, or any other safe location up wind of the "hot zone". If assembly in a location other than the Ready Room or the Guard House, call the **guard at 861-1221** and give him a head count and a list of names of those persons sheltering at that location. Stay off the telephone as much as possible so that you may be contacted.
- > All accidents or injuries must be reported immediately to the Plant Supervisor.
- > In the event the Emergency Contingency Plan is implemented, follow all instructions given to you by O.N. Stevens Water Plant employees since all Plant employees are trained in emergency response. Do not initiate any action on your own.

#### **FIREARMS**

- > **Firearms are not allowed to be carried into the plant premises** either in vehicles or on a person's body. Active duty law enforcement officers are exempt. Concealed weapon permits will not be honored at the plant.

### **EMERGENCY COORDINATORS**

- > Primary Coordinator - Mucio Garza, P.E., Water Production Superintendent, ph 861-1212, pager 880-9706.
- > First Alternate - On duty shift supervisor, Plant Supervisor III, ph 861-1215.
- > Second Alternate - Frank Rodriguez, Maintenance Superintendent, ph 861-1214.
- > Confined Space Entry Permits - Maintenance Superintendent or his designee, ph 861-1214, or Safety Coordinator, ph 861-1223.

**NOTE:** Contractors who will be engaged in construction activities at this facility for extended periods of time will be required to receive additional training.

Visitor/Contractor to retain pages 1 thru 6 for their information.



**O.N. STEVENS WATER TREATMENT PLANT  
VISITOR/CONTRACTOR AGREEMENT**

(Must be returned to O.N. Stevens Plant Signed and Dated before entry will be permitted.)

I, \_\_\_\_\_, have read and understand these  
Name (Please PRINT in all caps)

requirements and agree to abide by them as a condition to my being allowed access  
to the O.N. Stevens Water Plant. I understand that failing to comply with any of  
these requirements may result in my being asked to leave the Plant.

SIGNED: \_\_\_\_\_

DATE: \_\_\_\_\_

EMPLOYED BY: \_\_\_\_\_  
(No abbreviations, please PRINT in all caps)

ADDRESS: \_\_\_\_\_

CITY: \_\_\_\_\_

STATE: \_\_\_\_\_

ZIP CODE: \_\_\_\_\_

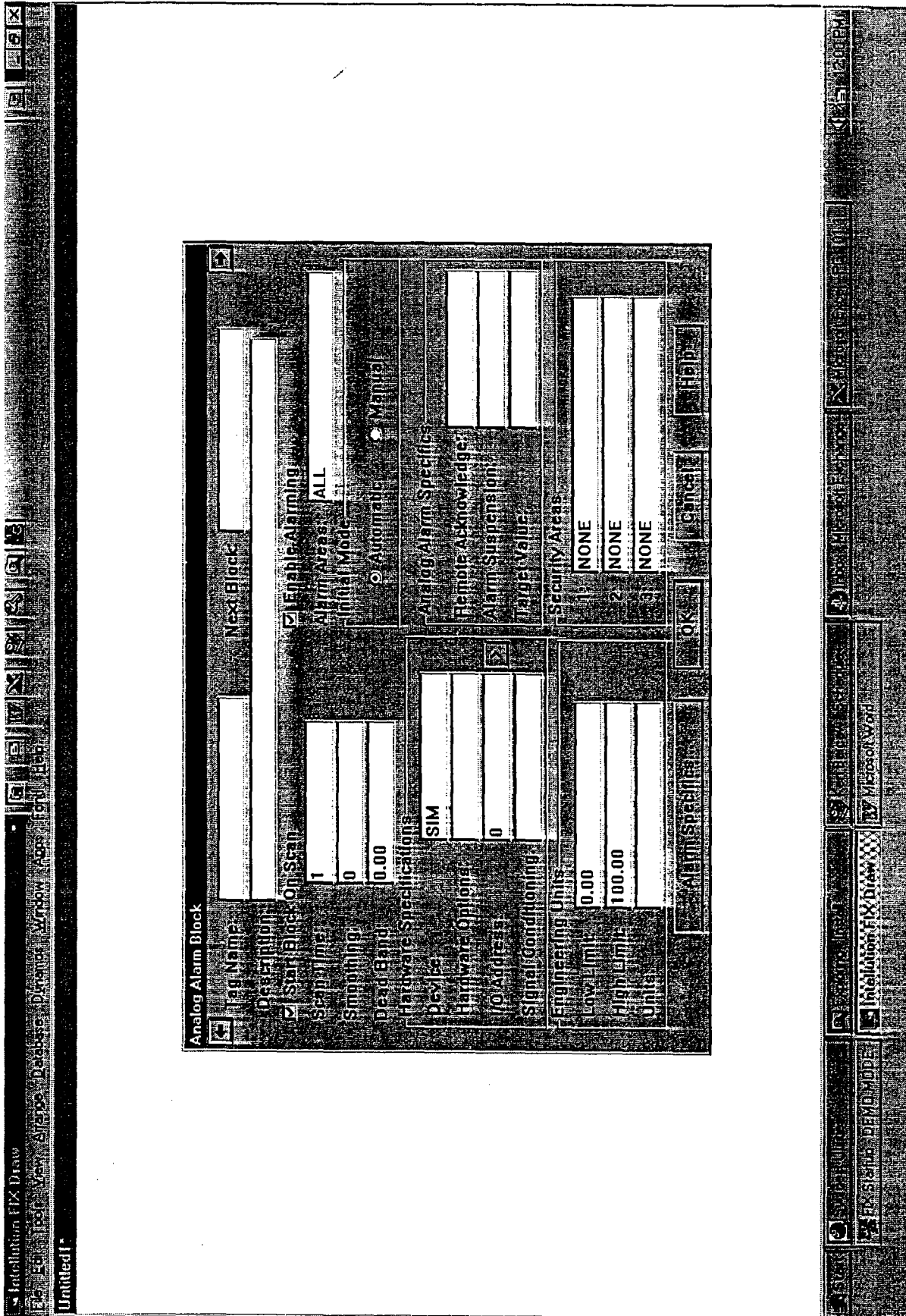
WITNESSED BY: \_\_\_\_\_

EMPLOYED BY: \_\_\_\_\_

ATTACHMENT II

EXAMPLE - PROGRAMMING BLOCKS

# EXAMPLE



USE Next 5 pages only if TWDB State Rev. Funds } Funds ARE used } WASTEWATER Projects  
\*(CK before USING)

Supplemental  
SPECIAL PROVISIONS

1. PRIVITY OF CONTRACT

This contract is expected to be funded in part with funds from the Texas Water Development Board. Neither the State of Texas nor any of its departments, agencies or employees is, or will be, a party to this contract or any lower tier contract. This contract is subject to regulations contained in 31 TAC Chapter 363 in effect on the date this contract is executed.

2. DEFINITION

THE TERM "TWDB" means the Executive Administrator of the Texas Water Development Board, or other person who may be at the time acting in the capacity or authorized to perform the functions of such Administrator, or the authorized representative thereof.

3. WITHHOLDING PAYMENTS

The Owner may withhold from any payment otherwise due the Contractor so much as may be necessary to protect the Owner and, if so elects, may also withhold any amounts due from the Contractor to any subcontractors or material dealers, for work performed or material furnished by them. The foregoing provisions shall be construed solely for the benefit of the Owner and will not require the Owner to determine or adjust any claims or disputes between the Contractor and his subcontractors or material dealers, or to withhold any moneys for their protection unless the Owner elects to do so. The failure or refusal of the Owner to withhold any moneys from the Contractor shall in no way impair the obligations of any surety or sureties under any bond or bonds furnished under this contract.

Withholding of any amount due the Owner, under general and/or special conditions regarding "Liquidated Damages", shall be deducted from partial and final payment due the Contractor.

The retainage and its interest earnings, if any, shall not be paid to the Contractor until the TWDB has authorized a reduction in, or release of, retainage on the contract work.

4. PAYMENTS SUBJECT TO SUBMISSION OF CERTIFICATES

Each payment to the Contractor by the Owner shall be made subject to submission by the Contractor of all written certifications required of him and his subcontractors by general or special conditions elsewhere in this contract.

5. REVIEW BY OWNER AND TWDB

- (a) The Owner, authorized representatives and agents of the Owner, and the TWDB shall, at all times, have access to and be permitted to observe and review all work, materials, equipment, payrolls, personnel records, employment conditions, material invoices, and other relevant data and records pertaining to this Contract, provided, however that all instructions and approval with respect to the work will be given to the Contractor only by the Owner through authorized representatives or agents.
- (b) Any such inspection or review by the TWDB shall not subject the State of Texas to any action for damages.



6. **FLOOD HAZARD INSURANCE**

These provisions apply to any contract which will construct structures that are insurable under the National Flood Insurance Program of the Federal Emergency Management Agency. The Contractor shall apply for flood insurance on all insurable structures that will be built under this contract. A copy of the completed application must be provided to the Owner before commencing construction of the project. The Contractor shall obtain the flood hazard insurance as soon as possible and submit a copy of the policy to the Owner.

7. **OPERATION AND MAINTENANCE MANUALS AND TRAINING**

- (a) The Contractor shall obtain installation, operation, and maintenance manuals from manufacturers and suppliers for equipment furnished under the contract. The Contractor shall submit three (3) copies of each complete manual to the Engineer within 90 days after approval of shop drawings, product data, and samples, and not later than the date of shipment of each item of equipment to the project site or storage location.
- (b) Each manual is to be bound in a folder and labeled to identify the contents and project to which it applies. The manual shall contain the following applicable items:
  - (1) A listing of the manufacturer's identification, including order number, model, serial number, and location of parts and service centers.
  - (2) A list of recommended stock of parts, including part number and quantity.
  - (3) Complete replacement parts list.
  - (4) Performance data and rating tables.
  - (5) Specific instructions for installation, operation, adjustment, and maintenance.
  - (6) Exploded view drawings for major equipment items.
  - (7) Lubrication requirements.
  - (8) Complete equipment wiring diagrams and control schematics with terminal identification.
- (c) Operations and maintenance manuals specified herein are in addition to any operation, maintenance or installation instructions required by the Contractor to install, test, and start-up the equipment.
- (d) The Owner shall require the Engineer to promptly review each manual submitted, noting necessary corrections and revisions. If the Engineer rejects the manual, the Contractor shall correct and re-submit the manual until it is acceptable to Engineer as being in conformance with design concept of project and for compliance with information given in the Contract Documents. Owner may assess Contractor a charge for review of same items in excess of three (3) times. Such procedure shall not be considered cause for delay. Acceptance of manuals by Engineer does not relieve Contractor of any requirements or terms of the Contract.
- (e) The Contractor shall provide the services of trained, qualified technicians to check final equipment installation, to assist as

required in placing same in operation, and to instruct operating personnel in the proper manner of performing routine operation and maintenance of the equipment.

8. AS-BUILT DIMENSION AND DRAWINGS

- (a) Contractor shall make appropriate daily measurements of facilities constructed and keep accurate records of location (horizontal and vertical) of all facilities.
- (b) Upon completion of each facility, the Contractor shall furnish Owner with one set of direct prints, marked with red pencil, to show as-built dimensions and locations of all work constructed. As a minimum, the final drawings shall include the following:
  - (1) Horizontal and vertical dimensions due to substitutions.
  - (2) Changes in equipment and dimensions due to substitutions.
  - (3) "Nameplate" data on all installed equipment.
  - (4) Deletions, additions, and changes to scope of work.
  - (5) Any other changes made.

9. ARCHEOLOGICAL DISCOVERIES

No activity which may affect a State Archeological Landmark is authorized until the Owner has complied with the provisions of the Antiquities Code of Texas. The Owner has previously coordinated with the appropriate agencies and impacts to known cultural or archeological deposits have been avoided or mitigated. However, the Contractor may encounter unanticipated cultural or archeological deposits during construction.

If archeological sites or historic structures are discovered after construction operations are begun, the Contractor shall immediately cease operations in that particular area and notify the Owner, the TWDB, and the Texas Historical Commission (512/463-6096). The Contractor shall take reasonable steps to protect and preserve the discoveries until they have been inspected by the Owner's representative and the TWDB. The Owner will promptly coordinate with the Texas Historical Commission and any other appropriate agencies to obtain any necessary approvals or permits to enable the work to continue. The Contractor shall not resume work in the area of the discovery until authorized to do so by the owner.

10. ENDANGERED SPECIES

No activity is authorized that is likely to jeopardize the continued existence of a threatened or endangered species as listed or proposed for listing under the Federal Endangered Species Act (ESA), and/or the State of Texas Parks and Wildlife Code on Endangered Species, or to destroy or adversely modify the habitat of such species.

If a threatened or endangered species is encountered during construction, the contractor shall immediately cease work in the area of the encounter and notify the Owner, who will immediately implement actions in accordance with the ESA and applicable State statutes. These actions shall include reporting the encounter to the TWDB, the U.S. Fish and Wildlife Service, and the Texas Parks and Wildlife Department, obtaining any necessary approvals or permits to enable the work to continue, or implement other

mitigative actions. The Contractor shall not resume construction in the area of the encounter until authorized to do so by the Owner.

11. LAWS TO BE OBSERVED

In the execution of the Contract, the Contractor must comply with all applicable Local, State and Federal laws, including but not limited to laws concerned with labor, safety minimum ages, and the environment. The Contractor shall make himself familiar with and at all times shall observe and comply with all Federal, State, and Local laws, ordinances and regulations which in any manner affect the conduct of the work, and shall indemnify and save harmless the Owner, the TWDB, and their representatives against any claim arising from violation of any such law, ordinance or regulation by himself or by his subcontractor or his employees.

12. EMPLOYMENT OF LOCAL LABOR

This condition applies only to construction contracts which receive funding from the TWDB's Economically Distressed Areas Program.

The Contractor shall, to the maximum feasible extent, employ local labor for construction of the project. The Contractor and every subcontractor undertaking to do work on the project which is, or reasonably may be done as on-site work, shall employ, in carrying out such contract work, qualified persons who regularly reside within the political subdivision boundary of the Owner and the economically distressed area where the project is located, except:

- (a) To the extent that qualified persons regularly residing within the political subdivision boundary of the Owner and economically distressed area are not available.
- (b) For the reasonable needs of any such Contractor or subcontractor, to employ supervisory or specially experienced individuals necessary to assure an efficient execution of the contract.
- (c) For the obligation of any such Contractor or subcontractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that in no event shall the number of non-resident persons employed under this subparagraph exceed twenty percent (20%) of the total number of employees employed by such Contractor and his/her subcontractors on such project.

Every such Contractor and subcontractor shall furnish the Owner and the Local Texas Employment Commission Office with a list of all positions for which it may, from time to time, require laborers, mechanics, and other employees, the estimated numbers of employees required in each classification, and the estimated dates on which such employees will be required.

The Contractor shall give full consideration to all qualified job applicants referred by the local employment service, but is not required to employ any job applicants referred whom the Contractor does not consider qualified to perform the classification of work required.

The payrolls maintained by the Contractor shall contain the following information: The employee's full name, address, and social security number, and a notation indicating whether the employee does, or does not, normally reside within the political subdivision boundary of the Owner or the economically distressed area. Copies of the payroll records shall be provided to the Owner.

The Contractor shall include the provisions of this condition in every subcontract for work which is, or reasonably may be, done as on-site work.

13. HAZARDOUS MATERIALS

Materials utilized in the project shall be free of any hazardous materials, except as may be specifically provided for in the specifications.

If the Contractor encounters existing materials on sites owned or controlled by the Owner or in material sources that are suspected by visual observation or smell to contain hazardous materials, the Contractor shall immediately notify the Engineer and the Owner. The Owner will be responsible for the testing for and removal or disposition of hazardous materials on sites owned or controlled by the owner. The Owner may suspend the work, wholly or in part during the testing, removal or disposition of hazardous materials on sites owned or controlled by the Owner.

\* USE As is No Editing Allowed  
 USE (Nov./94) Rev.

SECTION B  
 GENERAL PROVISIONS AND REQUIREMENTS  
 FOR MUNICIPAL CONSTRUCTION CONTRACTS

Table of Contents

	<u>PAGE</u>
<u>B-1 Definitions and Abbreviations</u>	
B-1-1 Definition of Terms . . . . .	1
B-1-2 Abbreviations . . . . .	3
<u>B-2 Proposal Requirements and Conditions</u>	
B-2-1 Proposal Forms . . . . .	4
B-2-2 Quantities in Proposal Forms . . . . .	4
B-2-3 Examination of Plans, Specifications, and site of the Work . . . . .	4
B-2-4 Forms, Plans and Specifications . . . . .	4
B-2-5 Addenda . . . . .	4
B-2-6 Pre-Bid Conference . . . . .	5
B-2-7 Preparation of Proposal . . . . .	5
B-2-8 Proposal Guaranty . . . . .	5
B-2-9 Filing of Proposal . . . . .	5
B-2-10 Withdrawing Proposals . . . . .	5
B-2-11 Cancellation of Bid Opening . . . . .	6
B-2-12 Opening Proposals . . . . .	6
B-2-13 Irregular Proposals . . . . .	6
B-2-14 Rejection of Proposals . . . . .	6
B-2-15 Disqualification of Bidders . . . . .	6
B-2-16 Disclosure of Interests . . . . .	6
<u>B-3 Award and Execution of Contract</u>	
B-3-1 Consideration of Contract . . . . .	7
B-3-2 Award of Contract . . . . .	7
B-3-3 Equal Opportunity Employer Provisions . . . . .	7
B-3-4 Surety Bonds . . . . .	8
B-3-5 Execution of Contract . . . . .	8
B-3-6 Failure to Execute Contract . . . . .	8
<u>B-4 Scope of Work</u>	
B-4-1 Intent of Plans and Specifications . . . . .	9
B-4-2 Subsidiary Work . . . . .	9
B-4-3 Increased or Decreased Quantities of Work . . . . .	9
B-4-4 Alteration of Plans and Specifications . . . . .	10
B-4-5 Value Engineering Incentive Procedures . . . . .	10
B-4-6 Extra Work . . . . .	11
<u>B-5 Control of the Work and Materials</u>	
B-5-1 Authority of the City Engineer . . . . .	11
B-5-2 Authority of Duty of Engineers or Inspectors . . . . .	11
B-5-3 Conformity with Plans . . . . .	11
B-5-4 Existing Structures . . . . .	11
B-5-5 Coordination of Plans, Specifications, Proposal & Special Provision . . . . .	12
B-5-6 Cooperation of Contractor . . . . .	12
B-5-7 Construction Staking . . . . .	12
B-5-8 Source of Supply of Materials . . . . .	13
B-5-9 Samples and Tests of Materials . . . . .	13
B-5-10 "Or Equal" Clause . . . . .	13
B-5-11 Storage of Materials . . . . .	13
B-5-12 Removal of Defective and Unauthorized Work . . . . .	13
B-5-13 Final Inspection . . . . .	14
B-5-14 Warranty Inspection . . . . .	14

IMP  
 (rev. Nov/04)

<b><u>B-6 Legal Relations and Public Responsibility</u></b>		
B-6-1	Laws to be Observed . . . . .	14
B-6-2	Permits and Licenses . . . . .	14
B-6-3	Patented Devices, Materials and Processes . . . . .	15
B-6-4	Sanitary Provisions . . . . .	15
B-6-5	Public Conveniences and Safety . . . . .	15
B-6-6	Privileges of contractor in Streets, Alleys and Right-of-Way . . . . .	16
B-6-7	Railway Crossings . . . . .	16
B-6-8	Traffic Control Devices . . . . .	16
B-6-9	Use of Explosives . . . . .	16
B-6-10	Protection and Restoration of Property . . . . .	16
B-6-11	Responsibility for Damage Claims . . . . .	17
B-6-12	Contractor's Claim for Damages . . . . .	19
B-6-13	Public Utilities and Other Property to be Changed . . . . .	19
B-6-14	Temporary Sewer and Drain Connections . . . . .	19
B-6-15	Arrangement and Charge for Water Furnished by the City . . . . .	19
B-6-16	Use of fire Hydrants . . . . .	19
B-6-17	Use of a Section or Portion of the Work . . . . .	19
B-6-18	Separate Contracts . . . . .	20
B-6-19	Contractor's Responsibility for the Work . . . . .	20
B-6-20	No Waiver of Legal Right . . . . .	20
B-6-21	Indemnification and Hold Harmless . . . . .	20
B-6-22	Tax Exemption Provisions . . . . .	20
<b><u>B-7 Prosecution and Progress</u></b>		
B-7-1	Subletting the Work . . . . .	21
B-7-2	Assignment of Contract . . . . .	21
B-7-3	Prosecution of the Work . . . . .	21
B-7-4	Limitation of Operations . . . . .	22
B-7-5	Character of Workmen and Equipment . . . . .	22
B-7-6	Working Hours . . . . .	22
B-7-7	Time of Commencement and Completion . . . . .	22
B-7-8	Extension of Time of Completion . . . . .	22
B-7-9	Computation of Contract Time for Completion . . . . .	23
B-7-10	Failure to complete on Time . . . . .	23
B-7-11	Suspension by court Order . . . . .	23
B-7-12	Temporary Suspension . . . . .	23
B-7-13	Suspension of Work and Annulment of Contract . . . . .	24
B-7-14	Termination of Contract . . . . .	25
<b><u>B-8 Measurement and Payment</u></b>		
B-8-1	Measurement of Quantities . . . . .	25
B-8-2	Unit Price . . . . .	25
B-8-3	Scope of Payment . . . . .	25
B-8-4	Payment for Extra Work . . . . .	26
B-8-5	Policy of Extra Work and Change Orders . . . . .	26
B-8-6	Partial Estimates . . . . .	27
B-8-7	Withholding Payment . . . . .	27
B-8-8	Final Cleanup . . . . .	27
B-8-9	Final Acceptance . . . . .	28
B-8-10	Final Payment . . . . .	28
B-8-11	Maintenance Guaranty . . . . .	28

SECTION B

GENERAL PROVISIONS AND REQUIREMENTS  
FOR MUNICIPAL CONSTRUCTION CONTRACTS  
CITY OF CORPUS CHRISTI, TEXAS

B-1 DEFINITIONS AND ABBREVIATIONS:

B-1-1 Definition of Terms:

Wherever the words, forms or phrases defined herein or pronouns used in their place occur in these specifications, in the contract, in the bonds, in the advertisement or any other documents or instrument herein contemplated, or to which these specifications apply or may apply, the intent and meaning shall be interpreted as follows:

Advertisement: All of the legal publications pertaining to the work contemplated or under contract.

Bidder: Any person, persons, partnership, company, firm, association, corporation, or joint venture acting directly or through a duly authorized representative submitting a proposal for work contemplated.

City: The City of Corpus Christi, Texas, a municipal corporation, acting by and through (a) its governing body or (b) its City Manager, each of whom is required by Charter to perform specific duties. Responsibility for final enforcement of contracts involving the City of Corpus Christi is, by Charter, vested in the City Manager.

City Attorney: The City Attorney of the City of Corpus Christi, Texas, or duly authorized assistants or agents.

City Council: The Council of the City of Corpus Christi, Texas.

City Engineer: The Head of the Department of Engineering Services of the City of Corpus Christi, Texas.

City Manager: The Manager of the City of Corpus Christi, Texas.

City Secretary: The City Secretary of the City of Corpus Christi, Texas, or duly authorized assistants or agents.

Contract: The written agreement covering the performance of the work. The contract includes the advertisement; proposal; specifications, including special provisions; plans or working drawings; any supplemental changes or agreements pertaining to the work or materials therefor, and bonds.

Contract Time: The number of calendar days or working days allowed for completion of the contract, including any authorized time extensions.

(a) Calendar Day: A calendar day is defined as any day shown on the calendar beginning and ending at midnight.

(b) Working Day: a working day is defined as a calendar day, not including Sundays or legal holidays, in which the weather or other conditions affecting the site, not under the control of the Contractor, will in the judgement of the Engineer permit the performance of some substantial unit of work for a substantially continuous period of time of not less than six (6) hours between 7 a.m. and 6 p.m., or during such other hours of the day as the Contractor does in fact work with the permission of the Engineer as elsewhere provided.

Each calendar day, not including Sundays or legal holidays, in which the Contractor carries on work on some unit of the contract for a period of more than six (6) hours shall be charged as one (1) working day, regardless of the number of hours worked in excess of the (6) hour minimum. Saturday will not be charged

as a working day unless work of any type requiring the presence of the Engineer is in fact carried on for any period of time during the day.

On Sundays and legal holidays on which, by previous written permission of the Engineer as elsewhere provided, the Contractor works as much as four hours on some unit of the contract, two working days shall be charged. If, under such permission, work is commenced but proceeds less than four hours, one working day shall be charged. In the determination of the hours above, no deduction shall be made for lunch time taken.

**Contractor:** The person, persons, partnership, company, firm, association, corporation, or joint venture entering into contract for the execution of the work, acting directly or through a duly authorized representative.

**Engineer:** Assistants, agents, engineers, inspectors, or superintendents duly authorized by the City Engineer and acting within the scope of the particular duties entrusted to them.

**General Provisions:** This Section B of the specifications.

**Holidays:** The terms regular holidays and legal holidays, for the purposes of charging working days, control of working days and hours, and wages of employees, shall include the following:

January 1 (New Year's Day)	July 4 (Independence Day)	Thanksgiving Days
Memorial Day	Labor Day	Christmas Day

**Maintenance Guaranty:** The approved form of security furnished by the Contractor and his surety as a guarantee that he will maintain the work constructed by him in good condition for the period of time required. This shall be in accordance with the provisions of the specifications and may be made a part of the Performance Bond.

**Payment Bond:** The approved form of security furnished by the contractor and his surety for the use and benefit of the City as a guarantee for the protection of all claimants supplying labor and/or material in the prosecution of the work provided for in this contract.

**Performance Bond:** The approved form of security furnished by the contractor and his surety for the use and benefit of the City as a guarantee of good faith on the part of the Contractor to execute the work in strict accordance with the plans, specifications, and terms of the contract, and that the Contractor will maintain the work constructed by him in good condition for the period of one year or such other period of time as may be specially provided.

**Plan or Plans:** All the drawings pertaining to the contract and made a part thereof, including such supplemental drawings or addenda as the City Engineer may issue in order to clarify other drawings or for the purpose of showing changes in the work hereinafter authorized, or for showing details not shown thereon.

**Proposal:** The written statement or statements duly filed with the City Secretary of the person, persons, partnership, company, firm, association, corporation, or joint venture proposing to do the work contemplated, including the approved form on which the formal bids for the work are to be prepared.

**Proposal Guaranty:** The bid security designated in the advertisement and proposal to be furnished by each bidder as a guarantee of good faith to enter into a contract with the City and execute the required bonds for the work contemplated after the work is awarded him.

**Special Provisions:** The special clauses setting forth conditions or requirements peculiar to the specific project involved, supplementing the standard specifications, and taking precedence over any conditions or requirements of the standard specifications with which they are in conflict.



**Specifications:** The directions, provisions, and requirements contained herein, together with the special provisions supplemental hereto, pertaining to the method and manner of performing the work or to the qualities or quantities of the material to be furnished under the contract.

**Sureties:** The corporate bodies which are bound by such bonds as are required with and for the Contractor.

**The Work:** All work, including the furnishing of labor, materials, tools, equipment, and incidentals, to be performed by the Contractor under the terms of the contract.

**B-1-2 Abbreviations:**

Wherever the abbreviations defined herein occur on the plans, in the specifications, contract, bonds, advertisement, proposal, or in any other document or instrument herein contemplated or to which the specifications apply or may apply, the intent and meaning shall be as follows:

A.A.S.H.T.O.	American Association of State Highway and Transportation Officials	H.S.	Horsehoe
Ac.	Acres	In. or "	Inches
A.C.	Asbestos Cement	Lb. or #	Pound
A.C.I.	American Concrete Institute	L.F.	Linear Foot
A.N.S.I.	American National Standards Institute	Lin.	Linear
Asph.	Asphalt	L.S.	Lump Sum
A.S.T.M.	American Society for Testing Materials	Max.	Maximum
Ave.	Avenue	M.H.	Manhole
A.W.P.A.	American Wood Preservers Association	Min.	Minimum
A.W.S.	American Welding Society	Mono.	Monolithic
A.W.W.A.	American Water Works Association	M.U.T.C.D.	Manual of Uniform Traffic Control Devices
Bivd.	Boulevard	N.	North
C.F.	Cable Foot	No.	Number
C.I.	Cast Iron	%	Percent
C.L.	Center Line	P.L.	Property Line
C.M.P.	Corrugated Metal Pipe	Prop.	Proposed or Property
C.O.	Clearance	P.V.C.	Poly Vinyl Chloride
Cons.	Concrete	R.	Radios
Cond.	Conduit	R.C.P.	Reinforced Concrete Pipe
Corr.	Corrugated	Reinf.	Reinforced
C.P.& L.	Central Power & Light Company	Rem.	Remove
Cu.	Cable	Rep.	Replace
Cutv.	Culvert	R.R.	Railroad
C.Y.	Cubic Yard	R/W or ROW	Right-of-Way
D.I.	Ductile Iron	S.	South
Dia.	Diameter	San.	Sanitary
Dr. or Drwy	Drive or Driveway	S.F.	Square Foot
E.	East	Sq.	Square
En.	Ench	St.	Street or Storm
Elev.	Elevation	Std.	Standard
Exist.	Existing	S.Y.	Square yard
F.	Fabrication	T.C.	Top of Curb
F.L.	Flow Line	Tel.	Telephone
Ft. or '	Foot	V.F.	Vertical Foot
Gal.	Gallon	W.	West
G.L.	Gutter Line	W.U.T.	Western Union Telegraph
G.P.M.	Gallons per Minute	Yd.	Yard
H.N.G.	Houston Natural Gas Co.		
<b>Metric:</b>			
cm	Centimeter	m.	Meter
gm	Gram	mgm	Milligram
kgm	Kilogram	mm	Millimeter
km	Kilometer		

Other abbreviations that may appear shall have the meaning customarily intended in such usage, circumstances, and context.

## B-2 PROPOSAL REQUIREMENTS AND CONDITIONS:

### B-2-1 Proposal Form:

The City will furnish bidders with proposal forms which state the general location and description of the contemplated work, and which will contain an itemized list of items of work to be done or materials to be furnished, and upon which bid prices are asked. The proposal form will provide for the amount of proposal guaranty, the contract time, and the acknowledgement of addenda received.

### B-2-2 Quantities in Proposal Form:

The quantities of the work and materials set forth in the proposal form or on the plans approximately represent the work to be performed and materials to be furnished and are for the purpose of comparing the bids on a uniform basis. Payment will be made by the City to the Contractor only for the actual quantities of work performed or materials furnished in accordance with the plans and specifications, and it is understood that the quantities may be increased or decreased as hereinafter provided without in any way invalidating the bid price.

### B-2-3 Examination of Plans, Specifications, and Site of the Work:

Bidders are advised that the plans and specifications and other documents on file with the City Engineer shall constitute all of the information which the City will furnish. Bidders are required, prior to submitting any proposal, to read the specifications, proposal, contract, and bond forms carefully; to visit the site of the work; to examine carefully local conditions, soil and water conditions to be encountered, improvements to be protected, disposal sites for surplus materials not designated to be salvaged materials, methods of providing ingress or egress to private properties, and methods of handling traffic; to inform themselves, by their independent research, tests, and investigation, of the difficulties to be encountered and judge for themselves of the accessibility of the work and all attending circumstances affecting the cost of doing the work or time required for its completion; and obtain all information required to make an intelligent proposal. No information given by the City or any official thereof, other than that shown on the plans and contained in the specifications, proposal, and other documents, shall be binding upon the City. Bidders shall rely exclusively upon their own estimates, investigations, tests, and other data which are necessary for full and complete information upon which the proposal may be based. It is mutually agreed that submission of a proposal is evidence that the bidder has made the examinations, investigations, and tests required herein.

### B-2-4 Forms, Plans and Specifications:

Unless otherwise specified in the Notice to Bidders and Special Provisions, forms of proposal, contract and bonds and plans and specifications may be obtained at the offices of the City Engineer in the City Hall upon making a Plans Deposit as designated, which sum so deposited will be refunded provided the prospective bidder returns all documents, except proposal form if bidding, to the offices of the City Engineer within two (2) weeks from and after the time and date of receiving proposals. If the prospective bidder does not comply with this requirement, the sum of the Plans Deposit shall become the property of the City of Corpus Christi, Texas.

### B-2-5 Addenda:

Addenda to the plans and specifications, which are formal written notices of additions, deletions, modifications, or explanations of contract documents from the City to prospective bidders in advance of the bid date, may be issued by the City Engineer. Such addenda will be mailed immediately to the address designated by prospective bidders taking out plans, specifications, and proposal forms.

**B-2-6 Pre-Bid Conference:**

Any prospective bidder may request a pre-bid conference to discuss the plans, specifications, and proposal. If such a conference is requested, it will be held approximately one week prior to the bid opening. Each prospective bidder who has furnished the Plans Deposit required by the Notice to Bidders will be notified of the date, time, and location of the pre-bid conference. Any clarification to the contract documents deemed necessary as a result of the pre-bid conference will be made by written addenda.

**B-2-7 Preparation of Proposal:**

The bidder shall submit his proposal on the forms furnished by the City. All blank spaces in the forms shall be correctly filled in, and the bidder shall state the prices, written in ink, for which he proposes to do the work contemplated or furnish the material required; the unit prices shall be written both in words and numerals. Such prices shall be written distinctly legible. In case of discrepancy between the unit price written in words and the unit price written in figures, the unit price written in words shall govern. The unit price shall govern over the amount. If the proposal is submitted by an individual, his name must be signed by him or his duly authorized agent. If the proposal is submitted by a firm, association, or partnership, the name and address of each member must be given and the proposal signed by a member of the firm, association, or partnership, or person duly authorized. If the proposal is submitted by a company or corporation, the company or corporate name and business address must be given and the proposal signed by an official or duly authorized agent. Proposals submitted by a joint venture shall list all participants and their addresses. Powers of attorney, authorizing agents or others to sign proposals, must be properly certified and must be in writing and submitted with the proposal.

**B-2-8 Proposal Guaranty:**

No proposal will be considered unless accompanied by an individual bid security (bond) for the project in the amount of five percent (5%) of the highest amount bid. Such bid security shall be issued by a firm licensed for issuance in the State of Texas. A cashier's check, certified check, money order, or bank draft from any state or national bank will also be acceptable. The security shall be deemed a good faith offer on the part of the bidder to accept a contract, if awarded. In the event the successful bidder declines to accept such award or cannot provide the required bonds and insurance certificates within ten (10) calendar days of the award of the contract, then the amount of the bid security will become the property of the City, not as penalty but as liquidated damages.

The bid securities of the unsuccessful bidders may be released within forty-eight (48) hours of the time bids are received. The bid security of the successful bidder will be released upon execution of the contract documents and submission of the required bonds and certificates.

**B-2-9 Filing of Proposal:**

No proposal will be considered unless it is filed with the City Secretary's office in the City Hall, Corpus Christi, Texas, within the time limit for receiving proposals as stated in the advertisement. Each proposal shall be in a sealed envelope, plainly marked with the word "PROPOSAL" and the name and description of the project as designated in the "ADVERTISEMENT".

**B-2-10 Withdrawing Proposals:**

Proposals filed with the City Secretary cannot be withdrawn or modified prior to the time set for opening proposals. Request for non-consideration of proposals must be made in writing addressed to the City Engineer and filed with the City Secretary prior to the time set opening proposals. After other proposals are opened and publicly read, the proposal for which withdrawal is properly requested may be returned unopened.

**B-2-11 Cancellation of Bid Opening:**

The City may, at any time, before any bids are actually opened, cancel the opening of the bids and return all bids unopened.

**B-2-12 Opening Proposals:**

The proposals filed with the City Secretary will be opened at the time stated in the advertisement and publicly read aloud and shall thereafter remain on file with the City. No contract will be entered into based upon such proposals until after forty-eight (48) hours shall have elapsed. Proposals not accompanied by the required proposal guaranty will not be read.

**B-2-13 Irregular Proposals:**

Proposals will be considered irregular if they show any omissions, failure to properly account for duly issued addenda, alterations of form, additions, conditions not called for, unauthorized alternate bids or irregularities or qualifications of any kind. However, the City reserves the right to waive any irregularities and to make the award in the best interest of the City.

**B-2-14 Rejection of Proposals:**

The City reserves the right to reject any or all proposals, and all proposals submitted are subject to this reservation. Proposals containing any irregularities or showing an unbalanced value of any items may be rejected. Proposals will be rejected for any of the following specific reasons:

- (a) Proposal received after the time limit for receiving proposals as stated in the advertisement.
- (b) Proposal submitted without the required bid security.
- (c) Proposal submitted and not sealed and/or identifiable to a particular project.

**B-2-15 Disqualification of Bidders:**

Bidders may be disqualified and their proposals not considered for any of the following specific reasons:

- (a) Reason for believing collusion exists among the bidders.
- (b) Reasonable grounds for believing that any bidder is interested in more than one proposal for the work contemplated.
- (c) The bidder being interested in any litigation against the City.
- (d) The bidder being in arrears on any existing contract, having defaulted on previous contracts, or being delinquent in the payment of City taxes.
- (e) Uncompleted work which, in the judgment of the City, will prevent or hinder the prompt completion of additional work if awarded.
- (f) Previous experience investigation reveals poor, incomplete, unacceptable, or inferior work performance and prosecution and lack of fiscal responsibility in paying for services, labor, or products rendered on such previous work.

**B-2-16 Disclosure of Interests:**

All entities desiring to do business with the City of Corpus Christi are required to provide a Disclosure of Interests. The required form is included as a part of the proposal. Prospective bidders may submit the form with their

proposal. The successful bidder shall be required to submit the form within seven (7) calendar days of the receipt of bids. The City also reserves the right to require similar statements from all material suppliers and subcontractors of the successful bidder.

**B-3 AWARD AND EXECUTION OF CONTRACT:**

**B-3-1 Consideration of Contract:**

After proposals are opened, the proposals will be tabulated for comparison on the basis of the bid prices and quantities shown in the proposal. Until final award of the contract, the City reserves the right to reject any or all proposals or proceed to do the work otherwise in the best interest of the City.

**B-3-2 Award of Contract:**

The City reserves the right to withhold the award of the contract for a reasonable period of time from date of opening proposals, and no award will be made until after investigations are made as to the responsibilities of the low bidder. In the City's considering of an award, the bidder may be requested to submit statements regarding previous experience in performing comparable or similar work, his business or technical organization and equipment to help the City evaluate the bidder's abilities. The basis for an award will be determined by the lowest responsible bidder (Article 2368a VATS) deemed most advantageous to the City and not necessarily the lowest bidder. In no case will a contract be awarded until at least forty-eight (48) hours shall have elapsed from the time of opening proposals.

**B-3-3 Equal Opportunity Employer Provisions:**

Every Contractor must agree that during the performance of his contract he will:

- (1) Treat all applicants and employees without discrimination as to race, color, religion, sex, or national origin.
- (2) Identify himself as an equal opportunity employer in all help wanted advertising or requests.

The Contractor is hereby advised that any complaints filed with the City alleging that a Contractor is not an equal opportunity employer during the six months preceding the date of receipt of bids will be referred to the Human Relations Commission through its Human Relations Administrator for the purpose of review and recommendations. The report of the Human Relations Commission will be transmitted to the City Engineer who will include a summary of such report with any future bid award recommendations for which the Contractor is a bidder and bring to the attention of the City Council any such report received prior to the issuance of a work order to any such Contractor. A copy of this report shall be sent to the Contractor. The Human Relations Administrator will follow up any such report and bring to the attention of the Commission any further action by the Contractor which would include that the findings of the Commission should be modified. Any such modified findings of the Commission will be delivered to the City Engineer with a copy to the Contractor and be included in any future bid award recommendations.

The City Council reserves the right to consider such reports in determining the best bid and to terminate, on the basis of such report, any portion of a contract for which a work order has not been issued. However, the Contractor is specifically advised that no equal opportunity employment complaint will be the basis for cancellation of any contract for which a work order has been issued.

#### B-3-4 Surety Bonds:

With the execution and delivery of the contract, the Contractor shall furnish and file with the City, in the amounts herein required, the following surety bonds:

(a) Performance Bond: A good and sufficient bond in an amount equal to one hundred percent (100%) of the approximate total amount of the contract, as evidenced by the proposal tabulation or otherwise, guaranteeing the full and faithful execution of the work and performance of the contract, and for the protection of the City and all other persons against damage by reason of negligence of the Contractor, or improper execution of the work, or the use of inferior materials. This bond shall provide for the repair and maintenance of all defects due to faulty materials, faulty combinations of materials, and/or faulty workmanship that appear within a period of one year from the date of completion and acceptance of the improvement by the City, or such lesser or greater period as may be designated in the Special Provisions. A Performance Bond will not be required if the contract amount does not exceed \$25,000.00.

(b) Payment Bond: A good and sufficient bond in an amount equal to one hundred percent (100%) of the approximate total amount of the contract, as evidenced by the proposal tabulation or otherwise, guaranteeing the full and proper protection of all claimants supplying labor and/or material in the prosecution of the work provided for in said contract and for the use of each such claimant. A Payment Bond will not be required if the contract amount does not exceed \$25,000.00.

(c) Other Bonds: Other bonds, if required in the Special Provisions.

No surety will be accepted by the City who is now in default or delinquent on any bonds or who is interested in any litigation against the City. All bonds shall be issued by an approved surety company authorized to do business in the State of Texas and acceptable to the City, and the surety shall designate an agent who is a resident of Nueces County, Texas. Each bond shall be executed by the Contractor and the surety.

Should any surety on the contract be determined unsatisfactory at any time by the City, notice will be given the Contractor to that effect, and the Contractor shall immediately provide a new surety satisfactory to the City. No payment will be made under the contract until the new surety, or sureties as required, has qualified and been accepted by the City. The contract shall not be operative nor will any payments be due or paid until approval of the bonds has been made by the City.

The City requires that the Power of Attorney submitted with any surety bond (Performance, Payment, etc.) be signed with an original signature and properly dated and sealed. In the event a facsimile Power of Attorney is used, the City must have on file a sworn statement from an officer of the surety company to the effect that the agent who signs the bond form for the surety is currently in good standing with the surety. It is also required that the facsimile be a true copy of the original Power of Attorney on file among the records of the surety in its home office, not be amended or abridge, still be in full force and effect, and that the City will be notified in the event of cancellation of the particular agent.

#### B-3-5 Execution of Contract:

The person or persons, partnership, company, firm, association, corporation, or joint venture to whom a contract is awarded shall, within ten (10) calendar days after such award and after the Contractor has been requested to execute the documents, sign the required contract, furnish the required insurance certificates, and execute the required bonds. No contract shall be binding on the City until it has been attested by the City Secretary, approved as to form by the City Attorney, executed for the City by the City Manager, and delivered to the Contractor.

**B-3-6 Failure to Execute Contract:**

The failure of the bidder to execute the required bonds, furnish the required insurance certificates, and sign the required contract within ten (10) calendar days after the contract is awarded and the Contractor has been requested to execute the documents shall be considered by the City as an abandonment of his proposal, and the City may annul the award. By reason of the uncertainty of the market prices of materials and labor and its being impracticable and difficult to determine accurately the amount of damages accruing the City by reason of the said bidder's failure to execute said bonds and contract within ten (10) calendar days, the proposal guaranty accompanying the proposal shall be the agreed amount of damages which the City will suffer by reason of such failure on part of the bidder and shall thereupon immediately be forfeited to the City. The filing of a proposal will be considered an acceptance of this provision.

**B-4 SCOPE OF WORK:**

**B-4-1 Intent of Plans and Specifications:**

The intent of the plans and specifications is to prescribe a complete work or improvement which the Contractor undertakes to do in full compliance with the plans, specifications, special provisions, proposal, and contract. The Contractor shall do all work as provided in the plans, specifications, special provisions, proposal and contract, and shall do such additional extra work as may be considered necessary to complete the work in a satisfactory and acceptable manner. The Contractor shall furnish all labor, tools, material, machinery, equipment and incidentals necessary for the prosecution of the work.

**B-4-2 Subsidiary Work:**

In the course of furnishing or constructing a complete work or improvement, certain work may be necessary which is subsidiary to the items which are established as pay items. Some such subsidiary work may be shown and specified in detail in the plans and specifications, other work may be less completely shown, and other such work which is entirely necessary for the satisfactory completion of the work as a whole may not be noted on the plans or in the specifications. It shall be the duty of the Contractor to carry out all such subsidiary work as if fully shown, and the cost of such work shall be made subsidiary to the established pay item.

**B-4-3 Increased or Decreased Quantities of Work:**

(a) The City reserves the right to alter the quantities of the work to be performed or to extend or shorten the improvements at any time when and as found necessary, and the Contractor shall perform the work as altered. No allowance will be made for any change in anticipated profits not shall such changes be considered as waiving or invalidating any conditions or provisions of the contract or bonds.

(b) A Major Item as used in this Section shall be construed to be any individual bit item included in the proposal that has a total cost equal to or greater than five percent (5%) of the total contract cost computed on the basis of the proposal quantities and the contract unit prices.

(c) When the quantity of work to be done or of materials to be furnished under any Major Item of the contract is more than one hundred twenty-five (125%) of the quantity of that unit stated in the proposal, then either party to the contract, upon demand, shall be entitled to revised consideration on that portion of the work above one hundred twenty-five percent (125%) of the quantity stated in the proposal.

(d) When the quantity of work done or materials to be furnished under any Major Item of the contract is less than seventy-five percent (75%) of the quantity of that item stated in the proposal, then either party to the contract, upon demand, shall be entitled to revised consideration on the work performed.

(e) Any revised consideration is to be determined by special agreement or as is hereinafter provided under "Payment for Extra Work".

B-4-4 Alteration of Plans and Specifications:

The City reserves the right to make such changes in the plans and specifications and in the character of the work as may be necessary or desirable to insure completion in the most satisfactory manner, provided such changes do not materially alter the original plans and specifications or change the general nature of the work as a whole. Such changes shall not be considered as waiving or invalidating any condition or provision of the contract and bonds.

B-4-5 Value Engineering Incentive Procedures:

After the award of the contract, the Contractor may develop and submit, to the City Engineer, Value Engineering Change Proposals (VECP's) identifying potential reductions in the contract cost by effective changes to the contract plans and specifications. Any VECP submittal shall include the following:

- (1) The present contract requirement and description of the proposal change including any modifications to the plans and specifications.
- (2) The comparative advantages and disadvantages of both the present requirement and the proposed change.
- (3) An analysis of how the proposed change will alter the function, characteristics and/or performance of a component.
- (4) A separate detailed cost estimate comparing the cost of the existing requirement and the cost of the proposed change including any costs which might be incurred in testing or evaluation of the proposed change.
- (5) A comparative projection of the operational and maintenance costs of the existing requirement and the proposed change.
- (6) A projection of the latest date which the VECP can be incorporated into the contract to achieve maximum cost savings. Any effect upon completion time or delivery schedule should also be noted.

The City Engineer shall notify the Contractor of the status of the VECP within thirty (30) days of its receipt. Acceptance or rejection of the VECP by the City Engineer shall be final. If the VECP is not accepted, written notification will be provided detailing the reasons for rejection. Any VECP may be accepted in whole or in part.

Execution by both parties of a change order to the contract covering the proposed changes shall constitute approval of the VECP and authorization to proceed with the changes. Until such time as the change order is executed, the Contractor shall perform in accordance with the provisions of the existing contract.

The Contractor's share of the savings resulting from approval of the VECP shall be fifty percent (50%) of the net cost savings calculated as follows:

Contractor's Share = .50 (existing contract requirement cost - proposed change costs - testing and evaluation costs incurred by the City or Contractor).

This savings will be reflected on the change order approving the VECP and authorizing the change. Deletion of contract work or construction items and changes initiated by the City will not be considered as VECP's. In those instances, the City will realize 100% of the contract reduction or cost savings.



**B-4-6 Extra Work:**

When additional work not shown in the plans and specifications or reasonably inferred as subsidiary work or as normal adaptation to existing conditions is required, the Contractor shall do such work when ordered in writing by the Engineer. Payment for such extra work will be made as hereinafter provided.

**B-5 CONTROL OF THE WORK AND MATERIALS:**

**B-5-1 Authority of the City Engineer:**

All work shall be performed under the supervision of the City Engineer in a workmanlike manner and to his satisfaction. He shall decide all questions which arise as to the quality and acceptability of materials furnished, work performed, manner of performance, rate of progress of the work, sequence of the construction, interpretation of the plans and specifications, acceptable fulfillment of the contract, compensation, mutual rights between Contractors under these specifications and suspension of the work. He shall determine the amount and quality of the work performed and materials furnished, and his decisions and estimates shall be final. His estimate in such event shall be a condition precedent to the right of the Contractor to receive money due him under the contract.

**B-5-2 Authority and Duty of Engineers or Inspectors:**

The City Engineer may appoint Engineers and/or Inspectors as assistants to inspect all work done and material furnished. Such inspection may extend to all or any part of the work and to the preparation, fabrication or manufacture of the materials to be used. The Engineer or Inspector will not be authorized to revoke, alter, expand, relax, or waive any requirements of the contract documents. The Engineer or Inspector will keep a record of the progress of the work and the manner in which it is being performed and inform the City Engineer of same. He is authorized to call to the attention of the Contractor any deficiency of the work or of materials to conform to the contract documents; however, failure to do so shall not constitute acceptance of said work. The Contractor shall furnish the Engineer with every reasonable facility for ascertaining whether or not the work performed was in accordance with the requirements and intent of the plans and specifications.

The Engineer or Inspector shall in no case act as foreman or supervisor or perform other duties for the Contractor nor interfere with the management of the work by the latter. Any advice which the Engineer or Inspector may give the Contractor shall in no way be construed as binding to the City or release the Contractor from fulfilling all the terms of the contract.

The Engineer or Inspector shall have the authority to reject materials or suspend the work until any questions at issue can be referred to and decided by the City Engineer. If the Contractor refuses to suspend operations on verbal order, the Engineer or Inspector shall issue a written order giving the reason for suspending the work. After delivering the order to the person in charge, the Engineer or Inspector shall immediately leave the job site. Work done during the absence of the Engineer or Inspector under these circumstances will not be accepted or paid for.

**B-5-3 Conformity with Plans:**

All work shall conform to the lines, grades, cross-sections, and dimensions shown on the plans. Any deviation from the plans which may be required by the exigencies of construction will be determined by the City Engineer and authorized by him in writing.

**B-5-4 Existing Structures:**

The plans show the location of all known surface and subsurface structures. However, the location of many gas mains, water mains, conduits, sewers, etc. is

unknown, and the City assumes no responsibility for failure to show any or all of these structures on the plans or to show them in their exact location. It is mutually agreed such failure will not be considered sufficient basis for claims for additional compensation for extra work in any manner whatsoever unless the obstruction encountered is such as to necessitate substantial changes in the lines or grades or requires the building of special work for which no provision is made in the plans and which is not essentially subsidiary to some item of work for which provision is made. It is assumed that, as elsewhere provided, the Contractor has thoroughly inspected the site, is informed as to the correct location of surface structures, has included the cost of such incidental work in the prices bid, and has considered and allowed for all foreseeable incidental work due to variable subsurface conditions, whether such conditions and such work are fully and properly described on the plans or not. Minor changes and variations of the work specified and shown on the plans shall be expected by the Contractor and allowed for as incidental to the satisfactory completion of a whole and functioning work or improvement.

**B-5-5 Coordination of Plans, Specifications, Proposal and Special Provisions:**

The plans, general provisions, proposal, special provisions, standard specifications and all supplemental documents are intended to describe a complete work and are essential parts of the contract. A requirement occurring in any of them is binding. In case of discrepancies, figured dimensions shall govern over scale dimensions; plans shall govern over specifications; special provisions shall govern over both general and standard specifications; and plans and quantities shown on the plans shall govern over those shown in the proposal. The Contractor shall not take advantage of any apparent error or omission in the plans and specifications, and the City Engineer shall be permitted to make such corrections or interpretations as may be deemed necessary for the fulfillment of the intent of the plans and specifications. In the event the Contractor discovers an apparent error or discrepancy, he shall immediately call this to the attention of the Engineer.

**B-5-6 Cooperation of Contractor:**

The Contractor will be supplied with three (3) copies of the plans and specifications. The Contractor shall have available on the work at all times one copy of said plans and specifications. The Contractor shall give to the work the consistent attention necessary to facilitate the progress thereof, and he shall cooperate with the City Engineer, his authorized representatives, and with other contractors in every way possible. The Contractor shall provide a competent superintendent on the work at all times who is fully authorized as his agent on the work. Such superintendent shall be capable of reading and understanding the plans and specifications and shall receive and fulfill instructions from the City Engineer or his authorized representatives. The Contractor shall provide all facilities to enable the Engineer or Inspector to inspect the workmanship and materials entering into the work. On marine work, the Contractor shall furnish motorboat transportation as required by the Engineer for the purpose of inspecting the work. The superintendent shall keep the City Engineer or his representative informed of the work he is planning to do and the work schedule.

**B-5-7 Construction Staking:**

The Engineer will furnish the Contractor with lines, grades, and measurements necessary for the proper prosecution and control of the work contracted for under these specifications. Such stakes or markings as the Engineer may establish either for his own use or the Contractor's guidance shall be preserved by the Contractor until authorized by the Engineer to remove same. Unnecessary destruction of stakes shall not be allowed by the Contractor. The Contractor shall be bound to examine the stakes set and check the lines and grades thus set against the plans and profiles, and shall be accountable particularly that gutters, structures, and pipes which drain in a certain direction on the plans do so drain when constructed.

**B-5-8 Source of Supply of Materials:**

The materials shall be the best procurable as required by the plans, specifications, and special provisions. The Contractor shall not start delivery of materials until the Engineer has approved the source of supply. Only material conforming to these specifications shall be used, only after written approval has been given by the Engineer, and only so long as the quality of said materials remains equal to the requirements of the specifications. The Contractor shall furnish approved materials from other sources if for any reason the product from any source at any time before commencement or during the prosecution of the work proves unacceptable. After approval, any material which has become mixed with or coated with dirt or any other foreign substances during its delivery and handling will not be permitted to be used in the work. New material is required unless otherwise specially provided in the plans and specifications.

**B-5-9 Samples and Tests of Materials:**

Where, in the opinion of the Engineer or as called for in the specifications, tests of material are necessary, such tests will be made at the expense of the City unless otherwise provided. The failure of the City to make any tests of materials shall in no way relieve the Contractor of his responsibility of furnishing materials conforming to the specifications. Tests, unless otherwise specified, will be made in accordance with the latest methods of the American Society for Testing Materials. The Contractor shall provide such facilities as the Engineer may require for collecting and forwarding samples and shall not use the materials represented by the samples until tests have been made. The Contractor shall furnish adequate samples without charge.

**B-5-10 "Or Equal" Clause:**

All bids shall be based on the specified products. Where two or more products are specified for an item of work, either one thereof is acceptable and the choice is left to the Contractor. Where only one product is specified, and where the term "or approved equal" or similar wording is used in connection with specified products, the Contractor may, if he so desires, offer for consideration a substitute product which he judges to be equal in every respect to the required product. When a specific process is specified as well as a guarantee of the results, the Contractor shall, if in his judgement the process may not produce the required result, offer for approval an alternative process which he would guarantee. All such offers shall be made in writing to the Engineer after award of contract.

The Contractor shall furnish to the Engineer with the first submittal sufficient drawings, specifications, samples, performance data, and other information necessary to assist the Engineer in determining whether the proposed substitution is acceptable. The burden of proof shall be upon the Contractor. No consideration will be given to incomplete submittals. Substitutions must be approved in writing before they may be used.

**B-5-11 Storage of Materials:**

Materials shall be stored so as to insure the preservation of their quality and fitness for the work. When directed by the Engineer, they shall be placed on wooden platforms or other hard, clean surfaces and not on the ground, and shall be placed under cover when directed. Stored materials shall be placed and located so as to facilitate prompt inspection. Particular attention is directed to the storage of structural steel and reinforcing steel, which shall not be stored on the ground.

**B-5-12 Removal of Defective and Unauthorized Work:**

All work which has been rejected or condemned shall be repaired, or if it cannot be repaired satisfactorily, it shall be removed and replaced at the Contractor's expense. Defective materials shall be immediately removed from the site of the work. Work done without line and grade having been given, work done

beyond the lines or not in conformity with the grades shown on the plans or as given, save as herein provided, work done without proper inspection, or any extra or unclassified work done without written authority and prior agreement in writing as to prices shall be done at the Contractor's risk and will be considered unauthorized and, at the option of the Engineer, may not be measured and paid for and may be ordered removed at the Contractor's expense. Upon failure of the Contractor to repair satisfactorily or to remove and replace rejected, unauthorized, or condemned work or materials immediately after receiving notice from the Engineer, the Engineer will, after giving written notice to the Contractor, have the authority to cause defective work to be remedied or removed and replaced or to cause unauthorized work to be removed, and to deduct the cost thereof from any monies due or to become due the Contractor.

**B-5-13 Final Inspection:**

The Engineer will make final inspection of all work included in the contract as soon as practicable after the work is completed and ready for acceptance. If the work is not acceptable to the Engineer at the time of such inspection, he will inform the Contractor as to the particular defects to be remedied before final acceptance will be made. Previous inspection by the Engineer or his representatives during the course of the work shall not be interpreted as approval or acceptance of work or materials which on final inspection are found to be defective or note in accordance with the contract and its duly authorized modifications.

**B-5-14 Warranty Inspection:**

Forty-five (45) to sixty (60) days prior to the expiration of the maintenance guaranty period as specified in the contract documents, a warranty inspection will be made. The Contractor may be notified when this examination will be made so that he or his representatives may be present.

Within the maintenance guaranty period, the Contractor when ordered by the Engineer, shall repair, replace or rebuild such portions which are found to be faulty because of materials or workmanship. The Contractor shall begin the remedial work within ten (10) calendar days of written order by the Engineer. In case the Contractor does not start remedial work within the above time limit, or in case of an emergency condition caused by faulty work, the City may take remedial action and charge the cost thereof against the Contractor and/or his surety.

**B-6 LEGAL RELATIONS AND PUBLIC RESPONSIBILITY:**

**B-6-1 Laws to be Observed:**

The Contractor shall at all times observe and comply with all Federal and State Laws and City ordinances and regulations which in any manner affect the conduct of the work and shall observe and comply with all orders, laws, ordinances and regulations which exist or which may be enacted later by bodies having jurisdiction or authority for such enactment. No pleas of misunderstanding or ignorance thereof will be considered. The Contractor and his surety shall indemnify and save harmless the City and all its officials, agents, and employees against any claims or liability arising from or based on the violation of any such law, ordinance, regulation or order, whether by himself or his employees.

**B-6-2 Permits and Licenses:**

The contractor shall procure all legally required building, plumbing, electrical and other permits and licenses, pay all charges and fees (except City fees), give all notices necessary and incidental to the due and lawful prosecution of the work, and arrange for all building, plumbing, electrical or other inspections as appropriate.

**B-6-3 Patented Devices, Materials and Processes:**

If the Contractor is required or desires to use any design, device, material or process covered by letters, patent or copyright, he shall provide for such use by suitable legal agreement with the patentee or owner. It is mutually agreed and understood that, without exception, contract prices shall include all royalties or costs arising from patents, trademarks and copyrights in any way involved in the work. The Contractor and his sureties shall indemnify and save harmless the City from any and all claims for infringement by reason of the use of any such patented design, device, material or process or any trademark or copyright in connection with the work agreed to be performed under this contract and shall indemnify the City for any cost, expense, or damage which it may be obliged to pay by reason of such infringement at any time during the prosecution of the work or after completion of the work.

**B-6-4 Sanitary Provisions:**

The Contractor shall establish and enforce among his employees such regulations in regard to cleanliness and disposal of garbage and waste as will tend to prevent the inception and spread of infection or contagious diseases and to prevent effectively the creation of a nuisance about the work or any property either public or private, and such regulations as are required by the Engineer shall be put into immediate force and effect by the Contractor. The necessary sanitary conveniences for the use of laborers on the work, properly secluded from public observation, shall be constructed and maintained by the Contractor in such manner and at such points as will be approved by the Engineer, and their use shall be strictly enforced by the Contractor. All sanitary laws and regulations of the State of Texas and the City of Corpus Christi shall be strictly complied with.

**B-6-5 Public Convenience and Safety:**

Materials stored about the work shall be so placed and the work shall at all times be so conducted as to cause no greater obstruction to the traveling public than is considered necessary by the Engineer. The Contractor shall, upon direction of the Engineer, make provisions by bridges or otherwise at sidewalks and private driveways for the free passage of pedestrians and vehicles provided that, where bridging is impracticable or unnecessary in the opinion of the Engineer, the Contractor may make arrangements satisfactory to the Engineer for the diversion of traffic and shall, at his own expense, provide all material and perform all work necessary for the construction and maintenance of roadways and bridges. Sidewalks must not be obstructed except by special permission of the Engineer. The materials excavated and the construction materials or plant used in the construction of the work shall be placed so as not to endanger the work or prevent free access to all fire hydrants, water valves, gas valves, manholes for telephone, telegraph, signal or electric conduits, sanitary or storm sewers, and fire alarm or police call boxes in the vicinity.

The City reserves the right to remedy any neglect on the part of the Contractor as regards the public convenience and safety which may come to its attention after twenty-four hours notice in writing to the Contractor except in case of emergency when it shall have the right to remedy any neglect without notice, and in either case, the cost of such work done by the City shall be deducted from monies due or to become due the Contractor. The Contractor shall notify the Fire and Police Division Headquarters when any street is closed or obstructed. Where the Contractor is required to construct temporary bridges or make other arrangements for crossings over ditches or streams, his responsibility for accidents shall include the roadway approaches as well as the structures of such crossings. The Contractor shall mark all detours as directed by the Engineer so that the entire route of the detour is designated, such markings to be by neat and workmanlike signs large enough and so painted and so placed as to be clearly visible.

**B-6-6 Privileges of Contractor in Streets, Alleys and Right-of-Way:**

For the performance of the contract, the Contractor will be permitted to occupy such portions of streets or alleys, or other public places or other right-of-way, as provided for in the ordinances of the City, as shown on the plans or as permitted by the Engineer. A reasonable amount of tools, materials and equipment for construction purposes may be stored in such space but not more than is necessary to avoid delay in the construction. Excavation and waste materials shall be piled or stacked in such a way as not to interfere with spaces that may be designated to be left free and unobstructed. Other Contractors of the City may, for all purposes be required by their contracts, enter upon the work and premises used by the Contractor, and the Contractor shall give to other contractors of the City all reasonable facilities and assistance for the completion of adjoining work. Any additional grounds desired by the contractor for his use shall be provided by him at his own cost and expense.

**B-6-7 Railway Crossings:**

Where the work encroaches upon any right-of-way of any railway, the City will secure the necessary easement for the work. Where railway tracks are to be crossed, the Contractor shall observe all the regulations and instructions of the railway company as to methods of doing the work or precautions for safety of property and the public. All negotiations with the railway company, except for right-of-way, shall be made by the Contractor. The railway company shall be notified by the Contractor not less than five (5) days previous to time of his intentions to begin the work. The Contractor will not be paid direct compensation for such railway crossing but shall receive only the compensation for such railway crossing as set out in the proposal.

**B-6-8 Traffic Control Devices:**

Where the Contractor's operations are carried on in or adjacent to any public right-of-way or public place and which, in the opinion of the City Engineer, interferes with normal vehicular and pedestrian traffic, the Contractor shall take appropriate measures to protect persons, property and the work. Such measures shall include but not be limited to barricades, lights, signs, fences, flagmen, and watchmen. Such measures shall be taken to exclude or route pedestrian and vehicular traffic around the work and area of operations. Barricades, lights, signs and flagmen shall be utilized in accordance with the Uniform Barricading Standards and Practices as adopted by the City.

The Contractor shall be responsible for all damages to persons, property and the work occasioned by his operations and said responsibility shall not cease until the project has been accepted by the city.

**B-6-9 Use of Explosives:**

Should the Contractor elect to use explosives in the prosecution of the work, the utmost care shall be exercised so as not to endanger life or property. The City shall not be held liable for damages done by the Contractor in the use of explosives. The Contractor shall notify the proper representatives of any public service corporation, any company or any individual not less than eight (8) hours in advance of the use of explosives which might damage or endanger their or his property along or adjacent to the work. Wherever explosives are stored or kept, they shall be stored in a safe and secure manner, and all storage places shall be plainly marked "DANGEROUS EXPLOSIVES" and shall be under the care of a competent watchmen at all times.

**B-6-10 Protection and Restoration of Property:**

Where the work passes over or through private property, the City will provide such right-of-way. The Contractor shall not enter upon private property for any purpose without having previously obtained permission from the owner. The Contractor shall be responsible for the preservation of and shall use every precaution to prevent damage to all trees, shrubbery, plants, lawns, fences,

culverts, bridges, pavements, driveways, sidewalks, etc., to all water, sewer and gas lines; to all conduits, to all overhead pole lines, or appurtenances thereof; and to all other public and private property along or adjacent to the work. The Contractor shall be responsible for all damage or injury to the property of any character resulting from any act, omission, neglect or misconduct in the execution of the work or in consequence of the non-execution thereof on the part of the Contractor, he shall restore or have restored at his own cost and expense such property to a condition similar to equal to that existing before such damage or injury was done by repairing, rebuilding or otherwise restoring as may be directed, or he shall make good such damage from injury in a manner acceptable to the owner or the Engineer. In case of failure on the part of the Contractor to restore such property or to make good such damage or injury, the Engineer may, after forty-eight (48) hours written notice under ordinary circumstances, and without notice when a nuisance or hazardous condition results, proceed to repair, rebuild or otherwise restore such property as may be determined necessary, and the cost thereof will be deducted from any monies due or to become due the Contractor under his contract.

**B-6-11 Responsibility for Damage Claims:**

The Contractor shall not commence work under this contract until he has obtained all insurance required herein and such insurance has been approved by the City. The Contractor shall not allow any subcontractor(s) to commence work until all similar insurance required of the subcontractor(s) has been so obtained.

Within ten (10) calendar days after the date the City requests that the Contractor sign the contract documents, the Contractor shall furnish the City with certificates of insurance evidencing that the Contractor has obtained insurance coverage of the types more particularly described below in parts (a) through (e) of this section. (For self-insured workers' compensation coverage, other documents, specified hereafter, may be substituted for the certificate of insurance just described). The workers' compensation insurance policy need not list the City as an additional insured. Additionally, all certificates of insurance shall state the name of the project in the "Description of Operations" section of such certificate. These certificates and any subsequent insurance certificates in connection with this particular contract shall be delivered to the offices of the City Engineer. The Certificates of Insurance shall state that ten (10) days written notice will be given the City before any policy covered thereby is changed or canceled and shall show the following minimum coverage in an insurance company acceptable to the City. The City reserves the right to modify minimum limits based upon the nature and scope of the work. The Contractor agrees to comply with the Supplemental Insurance Requirements stated in the "Special Provisions" section of this contract.

(a) General Liability, including Commercial General Form; Premises - Operations; Explosion & Collapse Hazard; Underground Hazard; Products/Completed Operations Hazard; Contractual Insurance, with an endorsement on the face of the certificate that it includes the "Hold Harmless" in the last paragraph of this provision; Broad Form Property Damage; Independent Contractors; and Personal Injury:

**MINIMUM INSURANCE COVERAGE**

Bodily Injury and Consequent Death . . . . .	\$300,000 Per Person
Bodily Injury and Consequent Death . . . . .	\$500,000 Each Occurrence
Property Damage . . . . .	\$100,000 Each Occurrence

(b) Automobile Liability - Owned, Nonowner or Rented:

**MINIMUM INSURANCE COVERAGE**

Bodily Injury and Consequent Death . . . . .	\$100,000 Per Person
Bodily Injury and Consequent Death . . . . .	\$300,000 Each Occurrence
Property Damage . . . . .	\$100,000 Each Occurrence

(c) Workers' Compensation and Occupational Diseases:

The Contractor shall obtain worker's compensation insurance coverage through a licensed insurance company or through self-insurance obtained in accordance with Texas law. If such coverage is obtained through a licensed insurance company, then the contract for coverage shall be written on a policy and endorsements approved by the Texas State Board of Insurance.

If such coverage is provided through self-insurance, then within ten (10) calendar days after the date the City requests that the Contractor sign the contract documents, the Contractor shall provide the City with a copy of its certificate of authority to self-insure its workers' compensation coverage as well as a letter, signed by the Contractor, stating that the certificate of authority to self-insure remains in effect and is not the subject of any revocation proceeding then pending before the Texas Workers' Compensation Commission. Further, if at any time before final acceptance of the Work by the City, such certificate of authority to self-insure is revoked or is made the subject of any proceeding which could result in revocation of the certificate, then the Contractor shall immediately provide written notice of such facts to the City, by certified mail, return receipt requested directed to: City of Corpus Christi, Department of Engineering Services, P.O. Box 9277, Corpus Christi, Texas 78469 - Attention: Contract Administrator.

Whether workers' compensation insurance coverage is provided through a licensed insurance company or through self-insurance, the coverage provided must be in an amount sufficient to assure that all worker's compensation obligations incurred by the Contractor will be promptly met.

(d) Employer's Liability:

Minimum Insurance Coverage - \$100,000 Per Person

(e) Builder's Risk Insurance Coverage:

Contractor will be responsible for providing builder's risk insurance coverage for the term of the contract up to and including the date the City finally accepts the project or work. Builder's risk coverage shall be an "All Risk" form. The policy shall be a completed value form. The Contractor shall provide such builder's risk coverage as indicated in the Special Provisions, which is estimated to be the value at completion of the real or personal property to be constructed, repaired or otherwise improved under the contract.

Contractor shall be responsible for paying all costs necessary to procure such builder's risk insurance coverage, including any deductible. The City shall be named an additional insured on any policies providing such insurance coverage.

In the event of accidents of any kind, the Contractor shall furnish the City with copies of all reports such accidents at the same time that the reports are forwarded to any other interested parties. It shall be the Contractor's primary responsibility for immediately notifying the carriers of any or all insurance under this contract in the event of a known loss or claim presented to the Contractor by the City or a third party.

Contractor agrees to indemnify, save harmless and defend the City, its agents, servants, and employees, and each of them against and hold it and them harmless from any and all lawsuits, claims, demands, liabilities, losses and expenses, including court costs and attorneys' fees, for or on account of any injury to any person, or any death at any time resulting from such injury, or any damage to any property, which may arise or which may be alleged to have arisen out of or in connection with the work covered by this contract. The foregoing indemnity shall apply except if such injury, death or damage is caused directly by the negligence or other fault of the City, its agents, servants, or employees or any other person indemnified hereunder.



**B-6-12 Contractor's Claim for Damages:**

Should the Contractor claim compensation for any alleged damage by reason of the acts or omissions of the City, he shall, within three (3) days after sustaining such alleged damage, make a written statement to the City Engineer, setting out in detail the nature of the alleged damage; and on or before the twenty-fifth (25th) day of the month succeeding that in which any such damage is claimed to have been sustained, the Contractor shall file with the City Engineer an itemized statement of the details and amount of such alleged damage and, upon request, shall give the City Engineer access to all books of accounts, receipts, vouchers, bills of lading and other books or papers containing any evidence as to the amount or such alleged damage. Unless such statements shall be filed as hereinabove required, the Contractor's claim for compensation shall be waived and he shall not be entitled to payment on account of such damage.

**B-6-13 Public Utilities and Other Property to be Changed:**

In case it is necessary to change or move, the property shall not be moved or interfered with until ordered to do so by the Engineer, unless the plans or specifications show that such work is to be done by the Contractor. The right is reserved to the owner of public utilities to enter upon the limits of the contract for the purpose of making such changes or repairs of their property that may be necessary by performance of the contract. The City reserves the right of entering upon the limits of the contract for the purpose of repairing or relaying sewer, gas and water lines and appurtenances, repairing structures, etc., and making other repairs, changes or extensions to any City property.

**B-6-14 Temporary Sewer and Drain Connections:**

When existing sewers have to be taken up or removed, the Contractor shall, at his cost and expense, provide and maintain temporary outlets and connections for all private or public drains or sewers. The Contractor shall also take care of all sewage and drainage which will be received from these drains and sewers; and for this purpose, he shall provide and maintain, at his own expense, adequate pumping facilities and temporary outlets or diversions. The Contractor, at his own expense, shall construct such troughs, pipes or other structures necessary and be prepared at all times to dispose of drainage and sewage received from these temporary connections until such time as the permanent connections are built and in service. The existing sewers and connections shall be kept in service and maintained under the contract except where specified or ordered to be abandoned by the Engineer. All water or sewage shall be disposed of in a satisfactory manner so that no nuisance is created and so that the work under construction will adequately be protected.

**B-6-15 Arrangement and Charge for Water Furnished by the City:**

Where the Contractor desires to use City water in connection with any construction work, he shall make complete and satisfactory arrangements with the City of Corpus Christi, Department of Public Utilities for so doing. However, this in no way obligates the City to provide water.

**B-6-16 Use of Fire Hydrants:**

No person shall open, turn off, interfere with, attach any pipe or hose to, or connect anything with any fire hydrant, stop valve or stop cock, or tap and water main belonging to the City unless duly authorized to do so by the City of Corpus Christi, Water Division Superintendent.

**B-6-17 Use of a Section or Portion of the Work:**

Wherever, in the opinion of the Engineer, any section or portion of the work or any structure is in suitable condition, it may be put into use upon the written order of the Engineer, and such usage shall not be held to be in any way an acceptance of said work or structure or any part thereof or as a waiver of any of the provisions of these specifications or the contract pending final

completion and acceptance of the work; all necessary repairs and removals of any section of the work so put into use, due to defective materials or workmanship or to operations of the Contractor, shall be performed by the Contractor at his own cost and expense.

**B-6-18 Separate Contracts:**

The City reserves the right to make essential installation of items not included in the contract prior to acceptance of the project from the Contractor. Within this right, the City may let other contracts or may do such work with its own materials and labor forces. The City, in reserving this right, warrants that it will cooperate with the Contractor's forces and goals. The Contractor shall not commit or permit any act which will interfere with the performance of work by any other contractor or company or by City employees. The Contractor shall cooperate to the end that the City may realize a complete functioning of the project on the date of Final Acceptance.

**B-6-19 Contractor's Responsibility for the Work:**

Until written acceptance by the Engineer, as provided for in these specifications, the work shall be under the charge and care of the Contractor, and he shall take every necessary precaution to prevent injury or damage to the work or any part thereof by action of the elements or from any other cause whatsoever, whether arising from the execution or non-execution of the work. The Contractor shall rebuild, repair, restore and make good, at his own cost and expense, all injuries or damages to any portion of the work occasioned by any of the hereinabove causes.

**B-6-20 No Waiver of Legal Right:**

Inspection by the Engineer, any order, measurement, quantity or certificate by the Engineer; any order by the City for payment of money; any payment for or acceptance of any work; or any extension of time; or any possession taken by the City shall not operate as a waiver of any provisions of the contract or any power therein reserved to the City of any rights or damages therein provided. Any waiver of any breach of contract shall not be held to be waiver of any other or subsequent breach. The City reserves the right to correct any error that may be discovered in any estimate that may have been paid and to adjust the same to meet the requirements of the contract and specifications. The City reserves the right to claim and recover by process of law sums as may be sufficient to correct any error or make good any deficiency in the work resulting from such error, dishonesty or collusion, upon the conclusive proof of collusion or dishonesty by the Contractor or his agents and the Engineer or his assistants, discovered in the work after the final payment has been made.

**B-6-21 Indemnification and Hold Harmless:**

The contractor shall hold the city, its officials, employees, attorneys, and agents harmless and shall indemnify the city, its officials, employees, attorneys, and agents from any and all damages, injury, or liability whatsoever from an act or omission of the Contractor, or any subcontractor, supplier, materialman, or their officials, employees, agents, or consultants, or any work done under the contract or in connection therewith by the Contractor, or any subcontractor, supplier, materialman, or their officials, employees, agents, or consultants, or the operations or activities of the Contractor or any subcontractor, supplier, materialman, or their officials, employees, agents, or consultants.

**B-6-22 Tax Exemption Provision:**

Contracts awarded by the City of Corpus Christi qualify for exemption pursuant to the provision of Article 20.04 (H) of the Texas Limited Sales, Excise and Use Tax Act.

The Contractor performing this contract may purchase, rent or lease all materials, supplies, equipment used or consumed in the performance of this contract by issuing to his supplier an exemption certificate in lieu of the tax, said exemption certificate complying with State Comptroller's Ruling #95-0.07. Any such exemption certificate issued by the contractor in lieu of the tax shall be subject to the provisions of the State Comptroller's Ruling #95-0.09 as amended to be effective October 2, 1968.

**B-7 PROSECUTION AND PROGRESS:**

**B-7-1 Subletting the Work:**

The Contractor shall perform with his own organization and with the assistance of workmen under his immediate superintendence, work of a value not less than fifty percent (50%) of the value of all work embraced in the contract exclusive of items not commonly found in contracts for similar work or which require highly-specialized knowledge, craftsmanship and/or equipment not ordinarily available in the organizations of Contractors performing work of the character embraced in the contract. No portion of the work covered by these specifications and contract, except contracts for purchase and delivery of materials, shall be sublet without written permission of the City. If the Contractor sublets any part of the work to be done under his contract, he will not, under any circumstances, be relieved of his responsibility and obligations. All transactions of the Engineer will be with the Contractor. Subcontractors will be considered only in the capacity of employees and/or workmen and shall be subject to the same requirements as to character, competency, wages and hours. The City will not recognize any subcontractor on the work. The Contractor shall, at all times when the work is in operation, be represented either in person or by a qualified superintendent or other designated representative.

**B-7-2 Assignment of Contract:**

The Contractor shall not assign, transfer, convey or otherwise dispose of the contract or his right, title or interest in or to the same, or any part thereof, without the previous consent of the City Council and concurred in by the sureties. If the contractor does without such previous consent assign, transfer, convey or otherwise dispose of the contract or of his rights, title or interest therein, or any part thereof to any persons, partnership, company, firm or corporation, or by bankruptcy, voluntary or involuntary, or by assignment under the insolvency laws of any state, attempt to dispose of the contract or make default in or abandon said contract, then the contract may, at the option of the City, be revoked or annulled, unless the sureties shall successfully complete said contract; and any monies due or to become due under said contract shall be retained by the City as liquidated damages for the reason that it would be impracticable and extremely difficult to fix the actual damages.

**B-7-3 Prosecution of the Work:**

Prior to beginning construction operations, the Contractor shall submit to the Engineer a chart or brief of his work schedule outlining the manner and sequence of prosecution of the work that he intends to follow in order to complete the contract within the allotted time. Whenever, during the course of the work, this planned sequence and/or method must be revised, such revision shall be submitted in writing to the Engineer.

The Contractor shall begin the work to be performed under this contract within the time limit stated in the Agreement and shall conduct the work in such a manner and with sufficient equipment, materials and labor as is necessary to insure its completion within the time limit. The sequence of all construction operations shall be at all times as directed be or approver by the Engineer. Such direction or approval by the Engineer shall not relieve the Contractor from the full responsibility of the complete performance of the contract. Should the prosecution of the work be discontinued by the Contractor, he shall notify the Engineer at least twenty-four (24) hours in advance of resuming operations.

**B-7-4 Limitation of Operations:**

The work shall be so conducted as to create a minimum amount of inconvenience to the public. At any time when, in the judgment of the Engineer, the Contractor has obstructed or closes or is carrying on operations on a greater portion of the street or public way than is necessary for the proper execution of the work, the Engineer may require the Contractor to finish the sections on which work is in progress before operations are started on any additional section.

**B-7-5 Character of Workmen and Equipment:**

Local labor shall be used by the Contractor if available. The Contractor may bring in from outside the City his key employees and superintendent. All other employees, including equipment operators, may be imported only after the local supply is exhausted.

The Contractor shall employ such superintendents, foremen, and workmen as are careful and competent and the Engineer may demand the dismissal of any person or persons employed by the Contractor in, about or on the work who shall misconduct himself or be incompetent or negligent in the proper performance of his or their duties or neglect or refuse to comply with the directions of the Engineer, and such person or persons shall not be employed thereon again without the written consent of the Engineer. All workmen shall have sufficient skill and experience to perform properly the work assigned them. The Contractor shall furnish such equipment as is considered necessary for the prosecution of the work in an acceptable manner and at a satisfactory rate of progress. All equipment, tools and machinery used for handling materials and executing any part of the work shall be subject to the approval of the Engineer and shall be maintained in a satisfactory working condition. Equipment on any portion of the work shall be such that no injury to the work or adjacent property will result from its use.

**B-7-6 Working Hours:**

Work shall be done only during the regular and commonly accepted and prescribed working hours. No work on any unit of this contract shall be performed before 7 a.m., or after 6 p.m., or on Sunday, or on a regular holiday as listed in the definitions, unless special permission is given in writing by the Engineer. Excepted from the preceding shall be the setting of flashers, maintenance of barricades, wetting of concrete curing mats, and such measures as the Contractor must take to protect life and property, as are of an emergency nature and not merely extensions of the regular working day. Attention is directed to the definition for contract time.

**B-7-7 Time of Commencement and Completion:**

The Contractor shall commence the work within the time specified, and the rate of progress shall be such that the whole work will be performed and the premises cleaned up in accordance with the contract, plans and specifications within the time limit specified in the contract unless an extension of time be made in the manner hereinafter specified.

**B-7-8 Extension of Time of Completion:**

The Contractor shall be entitled to an extension of time as provided herein only when claim for such extension is submitted to the City in writing by the Contractor within seven (7) days from and after the time when any alleged cause of delay shall occur, and then only when such claim is approved by the City. In adjusting the contract time for the completion of the project, unforeseeable cause beyond the control and without the fault or negligence of the Contractor, including but not restricted to inability to obtain supplies and materials, acts of God, or the public enemy, acts of the owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, unusually severe weather conditions (weather which is beyond the normal weather recorded and expected for the season or seasons of the year in the records of the National Oceanic and Atmospheric Administration's Climatic Data Center), or delays of subcontractors

due to such causes; all provided that actual stoppage of work ensues and no fault of the Contractor is involved.

If the satisfactory execution and completion of the contract should require work and materials in a greater amount, or quantities, than those set forth in the contract, then the contract time shall automatically be increased the same proportion as the cost of the additional work bears to the cost of the original work contracted for. No allowance will be made for delays or suspension of the prosecution of the work due to the fault of the Contractor.

**B-7-9 Computation of Contract Time for Completion:**

For the purpose of computation, the contract time shall begin with the tenth (10th) calendar day after the date of the written authorization by the City Engineer to begin work, or such earlier date as work, other than the delivery of materials, is actually commenced.

The Engineer shall furnish the Contractor a monthly statement showing the days (calendar or working) charged during the month. If no protest as to the correctness of the statement is filed within seven (7) days by the Contractor, the statement will stand.

Contract time shall be charged as described under the definition thereof.

**B-7-10 Failure to Complete on Time:**

The time of completion is the essence of the contract. For each day (calendar or working) that any work shall remain uncompleted after the time specified in the time specified in the proposal and contract, or the increased time granted by the City, or as automatically increased by additional work or materials ordered after the contract is signed, a sum per day will be deducted from the monies due the Contractor, not as a penalty but as liquidated damages. This sum of liquidated damages per day will be as shown in the special provisions, proposal or elsewhere in the contract documents.

The sum of money thus deducted for such delay, or noncompletion is not to be considered as a penalty but shall be deemed, taken and treated as reasonable liquidated damages since it would be impracticable and extremely difficult to fix the actual damages, with such sums of money to be deducted from Contractor's monies at the time or times such damages begin to occur, thence to the completion of construction.

**B-7-11 Suspension by Court Order:**

The Contractor shall suspend such part or parts of the work ordered by the Court, and will not be entitled to additional compensation by virtue of such Court Order. Neither will he be liable to the City in the event and for the time the work is suspended by Court Order.

**B-7-12 Temporary Suspension:**

The Engineer shall have the authority to suspend the work wholly or in part for such period or periods as he may deem necessary due to unsuitable weather conditions as are considered unfavorable for the suitable prosecution of the work. If it should become necessary to stop work for an indefinite period, the Contractor shall store all materials in such manner that they will not obstruct or impede the public unnecessarily or become damaged in any way, and he shall take every precaution to prevent damage or deterioration of the work performed; he shall provide suitable drainage about the work and erect temporary structures where necessary. The Contractor shall not suspend work without written authority from the Engineer and shall proceed with work promptly when notified by the Engineer to resume operations.

**B-7-13 Suspension of Work and Annulment of Contract:**

The work or any portion of the work under contract shall be suspended immediately on written order of the City Engineer or the City Manager, a copy of such notice to be served on the Contractor's sureties, or the contract may be annulled by the City for any good cause or causes, among others of which special reference is made to the following:

- (a) Failure of the Contractor to start the work within the specified number of calendar days from the date of written notice by the City to begin the work.
- (b) Substantial evidence that the progress of the work being made by the Contractor is insufficient to complete the work within the specified time.
- (c) Failure of the Contractor to provide sufficient and proper equipment for properly executing the work.
- (d) Substantial evidence that the Contractor has abandoned the work.
- (e) Substantial evidence that the Contractor has become insolvent or bankrupt, or otherwise financially unable to carry on the work.
- (f) Deliberate failure on the part of the Contractor to observe any requirements of these specifications or to comply with any orders given by the Engineer as provided for in these specifications.
- (g) Failure of the Contractor to promptly make good any defects in materials or workmanship, or any defects of any nature, the correction of which has been directed in writing by the Engineer.
- (h) Substantial evidence of collusion for the purpose of illegally procuring a contract or perpetrating fraud on the City in the construction of the work under contract.

When the work is suspended for any of the causes itemized above or for any other cause or causes, the Contractor shall discontinue the work or such part thereof as the City shall designate, whereupon the sureties may, at their option, assume the contract or that portion thereof which the City has ordered the Contractor to discontinue, and may perform the same, or may, with the written consent of the City, sublet the work or that portion of the work so taken over, provided however that the sureties shall exercise their option, if at all, within two (2) weeks after the written notice to discontinue the work has been served upon the Contractor and upon the sureties or their authorized agents. The sureties in such event shall assume the Contractor's place in all respects, and shall be paid by the City for all work performed by them in accordance with the terms of the contract. All monies remaining due the Contractor at the time of his default shall thereupon become due and payable to the sureties as the work progresses, subject to all the terms of the contract. In case the sureties do not, within the hereinabove specified time, exercise their right and option to assume the contract or that portion thereof which the City has ordered the Contractor to discontinue, then the City shall have the power to complete by contract or otherwise as it may deem necessary; and the Contractor hereto agrees that the City shall have the right to take possession of and use any of the materials, plant, tools, equipment, supplies and property of every kind provided by the Contractor for the purpose of his work and to procure other tools, equipment and materials for the completion of the same, and to charge to the account of the Contractor the expenses of said contract or labor, materials, tools, equipment and expenses incidental thereto. The expense so charged shall be deducted by the City out of such monies as may be due or may at any time thereafter become due the Contractor under and by virtue of the contract or any part thereof. The City shall not be required to obtain the lowest bid for the work of completing the contract, but the expenses to be deducted shall be the actual cost of such work. In case such expense is less than the sum which would

have been payable under the contract if the same had been completed by the Contractor, then in such case, the City may pay to the Contractor the difference in cost provided that the Contractor shall not be entitled to any claim for damages or for loss of anticipated profits; in case such expense shall exceed the amount which would have been payable under the contract if the same had been completed by the Contractor, then the Contractor and his sureties shall pay the amount of such excess to the City on notice from the City of the excess due. When any particular part of the work is being carried on by the City by contract or otherwise under the provisions of this section, the Contractor shall continue the remainder of the work in conformity with the terms of the contract, and in such manner as not to hinder or interfere with the performance of workmen employed as above provided by the City.

**B-7-14 Termination of Contract:**

The contract will be considered fulfilled, saved as provided in any maintenance stipulations, bond or by law, when all the work has been completed, the final inspection made by the Engineer, and final acceptance and final payment made by the City.

**B-8 MEASUREMENT AND PAYMENT:**

**B-8-1 Measurement of Quantities:**

The determination of quantities of work acceptably completed under the terms of the contract, or as directed by the Engineer in writing, will be made by the Engineer, based on measurements made by the Engineer. These measurements will be taken according to the U.S. Standard Measurements, used in common practice, and will be the actual length, area, solid contents, numbers and weight. It is pointed out that inclusion in the standard construction specifications of paragraphs describing methods of measurement and payment is not intended to imply that separate payments shall be made under each such standard specification. The units for which payment shall be made are those stated in the proposal.

**B-8-2 Unit Price:**

Where in the proposal form a "Unit Price" is set forth, the "Unit Price" shall include the furnishing by the Contractor of all labor, tools, materials, machinery, appliances, plant and equipment appurtenant to and necessary for construction in every detail and the completion in a first class, workmanlike manner of all the work to be done under these specifications. The "Unit Price" shall also include all permanent protection of overhead, surface and underground structures, cleaning up, finish, overhead expense, bond, insurance, patent fees, royalties, risk due to the elements, delay, profit, injuries, damages, claims and all other items not specifically mentioned that may be required to construct fully each item of the work complete in place.

**B-8-3 Scope of Payment:**

The Contractor shall receive and accept the compensation, as herein provided, in full payment for furnishing all labor, tools, materials, equipment and incidentals; for performing all work contemplated and embraced under the contract; for all loss or damage arising out of the nature of the work or from the action of the elements; for any unforeseen defects or obstructions which may arise or be encountered during the prosecution of the work and before its final acceptance by the Engineer; for all risks of whatever description connected with the prosecution of the work; for all expense incurred by or in consequence of suspension or discontinuance of such prosecution of the work as herein specified; for any infringement of patents, trademarks or copyrights; and for completing the work in an acceptable manner according to the plans and specifications. The payment of any current or partial estimate prior to final acceptance of the work by the City shall in no way constitute an acknowledgement of the acceptance of the work nor in any way prejudice or affect the obligation of the Contractor to repair, correct, renew, or replace, at his expense, any defects or imperfections

in the construction or in the strength or quality of the materials used in or about the construction of the work under contract and its appurtenances, nor any damage due or attributed to such defects, imperfections or damage shall have been discovered on or before the final inspection and acceptance of the work.

The Engineer shall be the sole judge of such defects, imperfections or damage; and the Contractor shall be liable to the City for failure to correct the same as provided herein.

**B-8-4 Payment for Extra Work:**

Extra work authorized and approved by the City Engineer and performed by the Contractor will be paid for in the manner hereinafter described, and the compensation thus provided shall be accepted by the Contractor as payment in full for all labor, material, tools, equipment and incidentals and all superintendents' time and timekeepers' services, all insurance, bond and all other overhead expenses incurred in the prosecution of the extra work. Payment for extra work will be calculated on one of the following basis, subject to all other conditions of the contract:

- (a) By unit prices agreed on in writing by both parties, payment to be for the quantity actually installed as finally measured.
- (b) By a lump sum price agreed on in writing by both parties.
- (c) By actual field cost of the work plus fifteen percent (15%) as described hereinbelow, agreed on in writing by both parties. In the event extra work is to be performed and paid for under this method, the actual field cost of the work will include the cost of all workmen, foremen, timekeepers, mechanics and laborers, and materials, supplies, trucks, rental or machinery equipment, only for the time actually employed or used on such extra work, plus all power, fuel, lubricants, water and similar operating expenses, and a rateable proportion of premiums on Performance and Payment Bonds, public liability and Workmen's Compensation and all other insurance required by law or ordinance. The Engineer will direct the form in which the accounts or actual field cost will be kept and will specify in writing the methods of doing the work, and the type and kind of machinery and equipment to be used, and shall have authority to suspend such extra work if in his judgement it is being conducted in a manner wasteful of materials, equipment, or labor, or is not being prosecuted in an efficient manner. The fifteen percent (15%) of the actual field cost to be paid the Contractor shall cover and compensate him for profit, overhead, general superintendence and field office expense, and all other elements of cost and expense not embraced within the actual field cost as herein specified. The Contractor shall give the Engineer access to all accounts, bills, invoices and vouchers relating thereto.

In the event agreement cannot be reached on method or prices of payment for extra work, the City reserves the right to enter on the job with its own forces or to hire other contractors to perform such extra work.

**B-8-5 Policy on Extra Work and Change Orders:**

The City Council of the City of Corpus Christi has adopted the following Construction Change Order Policy which will be applicable to all City construction projects, and the Contractor is hereby advised to be so guided in the proceeding with any item of work which he considers to be extra work:

- (a) All change orders require written quotations and must be approved in writing by the Contractor and the City Engineer or his representative prior to the work being done.



(b) All change orders in involving an expenditure of \$10,000.00 or more must be approved by the City Council.

(c) The City Manager, or duly authorized Assistant City Manager, has authority to approve change orders between \$5,000.00 and \$10,000.00. The City Manager may authorize change orders in excess of this amount only in emergency situations where undue delays could cause damages, either physical or monetary, to the City, Contractor, or general public. However, final approval must be granted by the City Council.

(d) The City Engineer has authority to issue change orders up to \$5,000.00.

(e) The total amount of all change orders to a contract shall not exceed 25% of the original contract price.

Contractors are advised that the City is under no obligation to appropriate change order(s) which have not been prepared and executed as stated herein. The addition of items of work covered by unit prices may be performed without written change orders unless the quantity and cost of such work, in the Engineer's opinion, require such written change orders, in which event the Contractor will be so notified.

**B-8-6 Partial Estimates:**

After the twenty-fifth (25th) day of the month and at the Contractor's request, the Engineer will make an approximate estimate of the value of the work done during the month under the specifications, which approximate estimate may include the full net invoice value of acceptable non-perishable materials delivered to the work (i.e. materials on hand). The Contractor shall furnish to the Engineer such detailed information as he may request to aid him as a guide in the preparation of partial estimates. It is understood that the partial estimates from month to month will be approximate only and all partial estimates and payments will be subject to correction in the estimate rendered following the discovery of an error in any previous estimate, and such estimate shall not in any respect be taken as an admission of the City of the amount of work done or of its quality or sufficiency nor as an acceptance of the work or the release of the contractor of any of his responsibility under the contract.

In determining the partial payment to be made to the Contractor, the City will retain five percent (5%) of the total approximate estimate, unless otherwise stated, and will deduct payments previously made. No partial payment will be made when the said estimate or the estimates of work done since the last previous estimate is less than One Hundred Dollars (\$100.00) in amount. All retainage is due and payable to the Contractor upon successful completion of the project and will be included in the final payment. Payment shall be withheld as elsewhere herein specified.

The City reserves the right to increase the retainage. In contracts in which the total amount bid is Four Hundred Thousand Dollars (\$400,000) or more and providing for retainage of greater than five percent (5%) of the total estimate, the amount retained shall be deposited in an interest bearing account and the interest earned shall be paid to the contractor upon completion of the contract with the final payment, unless withheld as otherwise specified.

**B-8-7 Withholding Payment:**

Payment of estimates may be withheld if the work is not being executed in accordance with the specifications and contract and/or to cover known claims as elsewhere specified.

**B-8-8 Final Cleanup:**

Upon completion of the work and before acceptance and final payment will be made, the contractor shall clean and remove from the site of the work surplus and discarded materials, temporary structures, and debris of every kind. He shall

leave the site of the work in a neat, orderly condition, equal to that which originally existed. Surplus and waste materials removed from the site of the work shall be disposed of at locations satisfactory to the Engineer. Such final cleanup shall in general be considered as subsidiary to the established pay items as a whole.

**B-8-9 Final Acceptance:**

Whenever the improvement provided for by contract shall have been completely performed on the part of the Contractor, the Contractor shall notify the Engineer that the improvement is ready for final inspection. The Engineer will then make such final inspection; and if the work is satisfactory and in accordance with the specifications and contract, he will certify such completion for Final Acceptance.

**B-8-10 Final Payment:**

Whenever the improvement provided for by contract shall have been completely performed on the part of the Contractor as evidenced by the Engineer in the Certificate of Final Inspection and Acceptance, a final estimate showing the value of the work will be prepared by the Engineer as soon as the necessary measurements and computations can be made. All prior estimates upon which payments have been made are subject to necessary corrections or revisions in the final payment. The amount of this final estimate, less any sums that have been deducted or retained under the provisions of the contract, will be paid the Contractor within thirty (30) days after Final Acceptance provided the Contractor has furnished to the City satisfactory evidence in the form of an affidavit(s) that all sums of money due for any labor, materials, apparatus, fixtures, or machinery furnished for and used in the prosecution of the work have been paid; or that the person or persons to whom the sum may respectively be due have consented to such final payment. The improvement will not be recommended for Final Acceptance until this payment affidavit has been submitted. The acceptance by the Contractor of the last payment as aforesaid shall operate as and shall be a release to the City from all claims or liabilities under the contract for anything done or furnished or relating to the work under the contract or for any act of neglect of said City relating to or connected with the contract.

**B-8-11 Maintenance Guaranty:**

The Contractor shall maintain and keep in good repair the work herein contracted to be done and performed for a period of one (1) year from the date of acceptance, or for such lesser or greater period as may be specially provided, shall do all necessary backfilling that may arise on account of sunken conditions in ditches, or otherwise, and shall do and perform all necessary work and repair any defective condition growing out of or arising from the improper joining of the same, or on account of any breaking of the same caused by the said Contractor, in laying or building the same, or on account of any defect arising in any of said parts of said work laid or constructed by said Contractor, or on account of improper excavation or backfilling; it being understood that the purpose of this section is to cover all defective conditions arising by reason of negligence of the Contractor, or by reason of defective materials, work or labor performed by the said Contractor, and in case the said Contractor shall fail to do so, it is agreed that the City may do said work and supply such materials, and charge the same against the said Contractor and sureties on this obligation. This provision shall further, and in addition, be evidence by the provisions of the Performance Bond or such other bond as may be required.

# PART C

Look



WAGE RATES WILL BE PROVIDED BY ENGINEERING SERVICES - WE WOULD NEED TO CHECK WITH AL DAVILA FOR CURRENT WAGE RATES TO INSERT AT TIME OF PROJECT BIDDING

880-3771

PART "S"

std - spec.

AND/OR

PART "T"

Tech - spec

INSERT APPLICABLE SPECIFICATIONS, IF ANY.

followed by

{ Exhibits  
Photo's  
DRAWING  
etc

Insert LIST OF DRAWINGS, if any.

*must*

**NOTICE**

THE FOLLOWING BLANK SPACES IN THE CONTRACT AND BONDS ARE NOT TO BE FILLED IN BY THE BIDDER AT THE TIME OF SUBMITTING HIS PROPOSAL. THE CONTRACT AND BONDS FORMS ARE SUBMITTED AT THIS TIME TO FAMILIARIZE THE BIDDER WITH THE FORM OF CONTRACT AND BONDS WHICH THE SUCCESSFUL BIDDER WILL BE REQUIRED TO EXECUTE.

Leave Blank

A G R E E M E N T

THE STATE OF TEXAS §  
COUNTY OF NUECES §

THIS AGREEMENT is entered into this KEYBOARD (date) day of KEYBOARD (month), 20KEYBOARD (year), by and between the CITY OF CORPUS CHRISTI of the County of Nueces, State of Texas, acting through its duly authorized City Manager, termed in the Contract Documents as "City," and KEYBOARD (company name) termed in the Contract Documents as "Contractor," upon these terms, performable in Nueces County, Texas:

In consideration of the payment of \$KEYBOARD (award amount) by City and other obligations of City as set out herein, Contractor will construct and complete certain improvements described as follows:

Fill-in  
must be the same as cover sheet + drawing

KEYBOARD (project name (all caps))

according to the attached Plans and Specifications in a good and workmanlike manner for the prices and conditions set out in their attached bid proposal supplying at their expense such materials, services, labor and insurance as required by the attached Contract Documents, including overseeing the entire job. The Contract Documents include this Agreement, the bid proposal and instructions, plans and specifications, including all maps, plats, blueprints, and other drawings, the Performance and Payment bonds, addenda, and related documents all of which constitute the contract for this project and are made a part hereof.

Fill-in as required for  
Project MUST be same  
as A-6 of special provisions

Delete

The Contractor will commence work within ten (10) calendar days from date they receive written work order and will substantially complete same within KEYBOARD(number & type of days to finish job) after construction is begun. Should Contractor default, Contractor may be liable for liquidated damages as set forth in the Contract Documents.

City will pay Contractor in current funds for performance of the contract in accordance with the Contract Documents as the work progresses.

Signed in 4 parts at Corpus Christi, Texas on the date shown above.

ATTEST:

CITY OF CORPUS CHRISTI

\_\_\_\_\_  
City Secretary

By: \_\_\_\_\_  
Ronald F. Massey  
Assistant City Manager of  
Public Works & Utilities

APPROVED AS TO LEGAL FORM:

\_\_\_\_\_  
City Attorney

By: \_\_\_\_\_  
Director of Engr. Services

CONTRACTOR

ATTEST: (If Corporation)

KEYBOARD(contractor)

\_\_\_\_\_  
(Seal Below)

By: \_\_\_\_\_

(Note: If person signing for corporation is not President, attach copy of authorization to sign.)

Title: \_\_\_\_\_

KEYBOARD(address)  
(Address)  
KEYBOARD(city, state & zip)  
(City) (State) (Zip)  
KEYBOARD(phone number)  
(Telephone Number)

(Revised August 2000)



PROPOSAL FORM  
FOR

*must be same  
as title sheet*

**KEYBOARD(PROJECT NAME)**

DEPARTMENT OF ENGINEERING SERVICES

CITY OF CORPUS CHRISTI, TEXAS

PROPOSAL FORM  
PAGE 1 OF 5

*must  
number*

P R O P O S A L

Place:

Date: \_\_\_\_\_

Proposal of \_\_\_\_\_,

a Corporation organized and existing under the laws of  
the State of \_\_\_\_\_.

OR

a Partnership or Individual doing business as

\_\_\_\_\_  
\_\_\_\_\_.

TO: The City of Corpus Christi, Texas

Gentlemen:

The undersigned hereby proposes to furnish all labor and materials, tools, and necessary equipment, and to perform the work required for:

*Fill-in must be same as cover sheet*

**KEYBOARD(project name)**

at the locations set out by the plans and specifications and in strict accordance with the contract documents for the following prices, to-wit:

*\* use only when bids will be lump sum*

BASE BID: \$ \_\_\_\_\_

*if unit price (omit) and use next sheets*

Show Qty + Unit  
 example  
 1 Lump Sum  
 1 L.S.  
 237 Linear feet  
 37 L.F.  
 e.a.  
 S.Y.

Project Name  
 Must Be Same AS  
 Cover Sht

Indicate whether sht. is for  
 BASE Bid  
 Additive Alternate  
 Deducitive Alternate

Project Name-  
 Base Bid? Alternate Bid?-

I	II	III	IV
BID ITEM	QTY & UNIT	DESCRIPTION	TOTAL PRICE IN FIGURES
KEYBOARD Item No.	KEYBOARD Qty & Unit	KEYBOARD (item description) complete in place per KEYBOARD (unit?) MUST BE SAME	\$ _____

TOTAL BASE BID: \$ \_\_\_\_\_

Show Bid item No.  
 example  
 1.  
 2.  
 3.  
 or if Bid Items are in PARTS due to funding source  
 example PART A water Imp.  
 Bid items A-1 } etc  
 A-2 }  
 A-3 }

Item description  
 indicate Bid item  
 By Title  
 example 8" Gate Valve  
 12" Colicche Base  
 Demolition  
 site work  
 yard piping

Proposal  
 — of —

for PARTS OF PROPOSAL.  
 ● example  
 PART A. #

OR ALTERNATES  
 ● example  
 Additive Alternate No 1 #

KEYBOARD (Project Name)  
 KEYBOARD (Base Bid? Alternate?)

I	II	III	IV
BID ITEM	QTY & UNIT	DESCRIPTION	TOTAL PRICE IN FIGURES
KEYBOARD (Item No.)	KEYBOARD (Qty. & Unit)	KEYBOARD (Item description), complete in place per KEYBOARD (Unit?)	\$ _____
KEYBOARD (Item No.)	KEYBOARD (Qty. & Unit)	KEYBOARD (Item description), complete in place per KEYBOARD (Unit?)	\$ _____

indicate **Sub-TOTAL BID:** \$ \_\_\_\_\_

OR

**TOTAL BASE Bid** \$ \_\_\_\_\_

Proposal  
 — of —

KEYBOARD (Project Name)  
 KEYBOARD (Base Bid? Alternate?)

I	II	III	IV
BID ITEM	QTY. & UNIT	DESCRIPTION	(TOTAL PRICE IN FIGURES)
KEYBOARD Item No.	KEYBOARD Qty. & Unit	KEYBOARD (Item description), complete in place per <u>KEYBOARD (unit)</u>	\$ _____
KEYBOARD Item No.	KEYBOARD Qty. & Unit	KEYBOARD (Item description), complete in place per <u>KEYBOARD (unit?)</u>	\$ _____
KEYBOARD Item No.	KEYBOARD Qty. & Unit	KEYBOARD (Item description), complete in place per <u>KEYBOARD (unit)</u>	\$ _____

TOTAL BID: \$ \_\_\_\_\_

KEYBOARD{Project Name}  
 KEYBOARD{Base Bid? Alternate Bid?}

I	II	III	IV	V
BID ITEM	QTY & UNIT	DESCRIPTION	UNIT PRICE IN FIGURES	BID ITEM EXTENSION (QTY X UNIT PRICE IN FIGURES)
KEYBOARD Item No.	KEYBOARD Qty & Unit)	KEYBOARD{item description}, complete in place per _ KEYBOARD{unit?}	_____	\$ _____

TOTAL BID: \$ \_\_\_\_\_

KEYBOARD{Project Name}  
 KEYBOARD{Base Bid? Alternate?}

I	II	III	IV	V
BID ITEM	QTY & UNIT	DESCRIPTION	UNIT PRICE IN FIGURES	BID ITEM EXTENSION (QTY X UNIT PRICE IN FIGURES)
KEYBOARD Item No.}	KEYBOARD Qty. & Unit}	KEYBOARD{Item description}, complete in place per _ KEYBOARD{Unit?}	_____	\$ _____
KEYBOARD Item No.}	KEYBOARD Qty. & Unit}	KEYBOARD{Item description}, complete in place per _ KEYBOARD{Unit?}	_____	\$ _____

TOTAL BID: \$ \_\_\_\_\_

KEYBOARD(Project Name)  
 KEYBOARD(Base Bid? Alternate?)

I	II	III	IV	V
BID ITEM	QTY & UNIT	DESCRIPTION	UNIT PRICE IN FIGURES	BID ITEM EXTENSION (QTY X UNIT PRICE IN FIGURES)
KEYBD Item No.}	KEYBOARD Qty. & Unit)	KEYBOARD(Item description), complete in place per <u>KEYBOARD</u> <u>unit</u>	_____	\$ _____
KEYBD Item No.}	KEYBOARD Qty. & Unit)	KEYBOARD(Item description), complete in place per <u>KEYBOARD</u> <u>unit?</u>	_____	\$ _____
KEYBD Item No.}	KEYBOARD Qty. & Unit)	KEYBOARD(Item description), complete in place per <u>KEYBOARD</u> <u>unit</u>	_____	\$ _____

TOTAL BID: \$ \_\_\_\_\_



KEYBOARD (Project Name)  
 KEYBOARD (Base Bid? Alternate?)

I	II	III	IV	V
BID ITEM	QTY. & UNIT	DESCRIPTION	UNIT PRICE IN FIGURES	BID ITEM EXTENSION (QTY. X UNIT PRICE IN FIGURES)
RECORD Item No.}	KEYBOARD Qty. & Unit)	KEYBOARD (Item description), complete in place per _ <u>KEYBOARD (unit)</u>	_____	\$ _____
RECORD Item No.}	KEYBOARD Qty. & Unit)	KEYBOARD (Item description), complete in place per _ <u>KEYBOARD (unit)</u>	_____	\$ _____
RECORD Item No.}	KEYBOARD Qty. & Unit)	KEYBOARD (Item description), complete in place per _ <u>KEYBOARD (unit)</u>	_____	\$ _____
RECORD Item No.}	KEYBOARD Qty. & Unit)	KEYBOARD (Item description), complete in place per _ <u>KEYBOARD (unit)</u>	_____	\$ _____

TOTAL BID: \$ \_\_\_\_\_

The undersigned hereby declares that he has visited the site and has carefully examined the plans, specifications and contract documents relating to the work covered by his bid or bids, that he agrees to do the work, and that no representations made by the City are in any sense a warranty but are mere estimates for the guidance of the Contractor.

Upon notification of award of contract, we will within ten (10) calendar days execute the formal contract and will deliver a Performance Bond (as required) for the faithful performance of this contract and a Payment Bond (as required) to insure payment for all labor and materials. The bid bond attached to this proposal, in the amount of 5% of the highest amount bid, is to become the property of the City of Corpus Christi in the event the contract and bonds are not executed within the time above set forth as liquidated damages for the delay and additional work caused thereby.

**Minority/Minority Business Enterprise Participation:** The apparent low bidder shall, within five days of receipt of bids, submit to the City Engineer, in writing, the names and addresses of MBE firms participating in the contract and a description of the work to be performed and its dollar value for bid evaluation purpose.

**Number of Signed Sets of Documents:** The contract and all bonds will be prepared in not less than four counterpart (original signed) sets.

*Same as  
A-6*

**Time of Completion:** The undersigned agrees to complete the work within KEYBOARD (number of days) KEYBOARD (type of days) days from the date designated by a Work Order.

The undersigned further declares that he will provide all necessary tools and apparatus, do all the work and furnish all materials and do everything required to carry out the above mentioned work covered by this proposal, in strict accordance with the contract documents and the requirements pertaining thereto, for the sum or sums above set forth.

Receipt of the following addenda is acknowledged (addenda number): \_\_\_\_\_

Respectfully submitted:

Name: \_\_\_\_\_

By: \_\_\_\_\_

(SIGNATURE)

Address: \_\_\_\_\_

(P.O. Box) (Street)

(City) (State) (Zip)

Telephone: \_\_\_\_\_

(SEAL - IF BIDDER IS  
a Corporation)

*This should be  
3rd from last  
sheet of proposal*

**NOTE:** Do not detach bid from other papers.  
Fill in with ink and submit complete  
with attached papers.



**CITY OF CORPUS CHRISTI  
DISCLOSURE OF INTERESTS**

City of Corpus Christi Ordinance 17112, as amended, requires all persons or firms seeking to do business with the City to provide the following information. Every question must be answered. If the question is not applicable, answer with "NA".

**FIRM NAME:** \_\_\_\_\_

**STREET:** \_\_\_\_\_ **CITY:** \_\_\_\_\_ **ZIP:** \_\_\_\_\_

**FIRM is:** 1. Corporation      2. Partnership      3. Sole Owner      4. Association  
5. Other \_\_\_\_\_

**DISCLOSURE QUESTIONS**

If additional space is necessary, please use the reverse side of this page or attach separate sheet.

**1. State the names of each "employee" of the City of Corpus Christi having an "ownership interest" constituting 3% or more of the ownership in the above named "firm".**

Name      Job Title and City Department (if known)

\_\_\_\_\_  
\_\_\_\_\_

**2. State the names of each "official" of the City of Corpus Christi having an "ownership interest" constituting 3% or more of the ownership in the above named "firm".**

Name      Title

\_\_\_\_\_  
\_\_\_\_\_

**3. State the names of each "board member" of the City of Corpus Christi having an "ownership interest" constituting 3% or more of the ownership in the above named "firm".**

Name      Board, Commission or Committee

\_\_\_\_\_  
\_\_\_\_\_

**4. State the names of each employee or officer of a "consultant" for the City of Corpus Christi who worked on any matter related to the subject of this contract and has an "ownership interest" constituting 3% or more of the ownership in the above named "firm".**

Name      Consultant

\_\_\_\_\_  
\_\_\_\_\_

**CERTIFICATE**

I certify that all information provided is true and correct as of the date of this statement, that I have not knowingly withheld disclosure of any information requested; and that supplemental statements will be promptly submitted to the City of Corpus Christi, Texas as changes occur.

**Certifying Person:** \_\_\_\_\_ **Title:** \_\_\_\_\_  
(Type or Print)

**Signature of Certifying Person:** \_\_\_\_\_ **Date:** \_\_\_\_\_

## DEFINITIONS

- a. "Board Member". A member of any board, commission or committee appointed by the City Council of the City of Corpus Christi, Texas.
- b. "Employee". Any person employed by the City of Corpus Christi, Texas, either on a full or part time basis, but not as an independent contractor.
- c. "Firm". Any entity operated for economic gain, whether professional, industrial or commercial and whether established to produce or deal with a product or service, including but not limited to, entities operated in the form of sole proprietorship, as self-employed person, partnership, corporation, joint stock company, joint venture, receivership or trust and entities which, for purposes of taxation, are treated as non-profit organizations.
- d. "Official". The Mayor, members of the City Council, City Manager, Deputy City Manager, Assistant City Managers, Department and Division Heads and Municipal Court Judges of the City of Corpus Christi, Texas.
- e. "Ownership Interest". Legal or equitable interest, whether actually or constructively held, in a firm, including when such interest is held through an agent, trust, estate or holding entity. "Constructively held" refers to holding or control established through voting trusts, proxies or special terms of venture or partnership agreements.
- f. "Consultant". Any person or firm, such as engineers and architects, hired by the City of Corpus Christi for the purpose of professional consultation and recommendation.

*This is your last  
sheet for Proposal*

Leave Blank

DO NOT CHANGE

P E R F O R M A N C E   B O N D

STATE OF TEXAS §  
COUNTY OF NUECES §

KNOW ALL BY THESE PRESENTS:

THAT \_\_\_\_\_ of \_\_\_\_\_ County, Texas, hereinafter called "Principal", and \_\_\_\_\_, a corporation organized under the laws of the State of \_\_\_\_\_, and duly authorized to do business in the State of Texas, hereinafter called "Surety", are held and firmly bound unto the City of Corpus Christi, a municipal corporation of Nueces County, Texas, hereinafter called "City", in the penal sum of KEYBOARD (amount in words) (KEYBOARD (amount in figures)) DOLLARS, lawful money of the United States, to be paid in Nueces County, Texas, for the payment of which sum well and truly to be made we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents:

THE CONDITION OF THIS OBLIGATION IS SUCH THAT: Whereas, the principal entered into a certain contract with the City of Corpus Christi, dated the KEYBOARD (day) of KEYBOARD (month), 20 KEYBOARD (year), a copy of which is hereto attached and made a part hereof, for the construction of:

KEYBOARD (project name)

Must be same as cover sheet

NOW, THEREFORE, if the principal shall faithfully perform said work in accordance with the plans, specifications and contract documents, including any changes, extensions, or guaranties, and if the principal shall repair and/or replace all defects due to faulty materials and/or workmanship that appear within a period of one (1) year from the date of completion and acceptance of improvements by the City, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED FURTHER, that if any legal action be filed on this bond, venue shall lie in Nueces County, Texas.

And that said surety for value received hereby stipulates that no change, extension of time, alteration or addition to the terms of the contract, or to the work performed thereunder, or the plans, specifications, drawings, etc., accompanying the same shall in anywise affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract, or to the work to be performed thereunder.

This bond is given to meet the requirements of Article 5160, Vernon's Civil Statutes of Texas, and other applicable statutes of the State of Texas.

The undersigned agent is hereby designated by the Surety herein as the Agent Resident in Nueces County to whom any requisite notices may be delivered and on whom service of process may be had in matters arising out of such suretyship, as provided by Art. 7.19-1, Vernon's Texas Insurance Code.

IN WITNESS WHEREOF, this instrument is executed in 4 copies, each one of which shall be deemed an original, this the \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

**PRINCIPAL**

By: \_\_\_\_\_

**ATTEST**

Secretary

**SURETY**

By: \_\_\_\_\_  
Attorney-in-fact

The Resident Agent of the Surety in Nueces County, Texas, for delivery of notice and service of process is:

NAME: \_\_\_\_\_

ADDRESS: \_\_\_\_\_  
(P.O. Box) (Street)  
\_\_\_\_\_  
(City) (State) (Zip)

(NOTE: Date of Performance Bond must not be prior to date of contract.)

(Revised August 2000)

DO NOT CHANGE

PAYMENT BOND

STATE OF TEXAS ()

KNOW ALL BY THESE PRESENTS:

COUNTY OF NUECES ()

THAT \_\_\_\_\_ of \_\_\_\_\_ County, Texas, hereinafter called "Principal" and \_\_\_\_\_, a corporation organized under the laws of the state of \_\_\_\_\_ and duly authorized to do business in the State of Texas, hereinafter called "Surety", are held and firmly bound unto the City of Corpus Christi, a municipal corporation of Nueces County, Texas, hereinafter called "City", and unto all persons, firms and corporations supplying labor and materials in prosecution of the work referred to in the attached contract, in the penal sum of \_\_\_\_\_ (\$ \_\_\_\_\_) DOLLARS, lawful money of the United States, to be paid in Nueces County, Texas, for the payment of which sum well and truly to be made we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents:

Must be same as cover sheet

THE CONDITION OF THIS OBLIGATION IS SUCH THAT: Whereas, the principal entered into a certain contract with the City of Corpus Christi, dated the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, a copy of which is hereto attached and made a part hereof, for the construction of

KEYBOARD (PROJECT NAME (bold/caps))

NOW, THEREFORE, if the principal shall faithfully perform its duties and make prompt payment to all persons, firms, subcontractors, corporations and claimants supplying labor and material in the prosecution of the work provided for in said contract and any and all duly authorized modification of said contract that may hereinafter be made, notice of which modification to the surety is hereby expressly waived, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED FURTHER, that if any legal action be filed upon this bond, venue shall lie in Nueces County, Texas.

And that said surety for value received hereby stipulates that no change, extension of time, alteration or addition to the terms of the contract, or to the work performed thereunder, or the plans, specifications, drawings, etc., accompanying the same shall in anywise affect its obligation on this bond and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract, or to the work to be performed thereunder.

This bond is given to meet the requirements of Article 5160, Vernon's Civil Statutes of Texas, and other applicable statutes of the state of Texas. The terms "Claimant", "Labor" and "Material", as used herein are in accordance with and as defined in said Article.

The undersigned agent is hereby designated by the Surety herein as the Agent Resident in Nueces County to whom any requisite notices may be delivered and on whom service of process may be had in matters arising out of such suretyship, as provided by Art. 7.19-1, Vernon's Texas Insurance Code.

IN WITNESS WHEREOF, This instrument is executed in 4 copies, each one of which shall be deemed an original, this the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

**PRINCIPAL**

\_\_\_\_\_  
By: \_\_\_\_\_

**ATTEST**

\_\_\_\_\_  
Secretary

**SURETY**

\_\_\_\_\_  
By: \_\_\_\_\_  
Attorney-in-fact

The Resident Agent of the Surety in Nueces County, Texas, for delivery of notice and service of process is:

NAME: \_\_\_\_\_

ADDRESS: \_\_\_\_\_  
(P. O. Box) (Street Address)  
\_\_\_\_\_  
(City) (State) (Zip)

(Note: Date of Payment Bond must not be prior to date of contract)

(Revised August 2000)



**TAB SEVEN—SMALL**  
**CONSTRUCTION**  
**CONTRACT**  
**DOCUMENTS**

**(Attachment No. 12 – New Document: December 2004)**

**Use when no Pre-Bid Meeting will be held.**

DATE

**TO:** Prospective Bidders  
**FROM:** 'Angel R. Escobar, P.E., Director of Engineering Services  
**SUBJECT:** **Bid Package - Project Name (Project Number)**

Attached you will find a Small Project Construction Agreement Bid Package for the above-referenced project. The following special instructions shall apply:

- A. Bidders proposal shall include a Small Project Construction Agreement with an **original signature**. The contract will also state the contractor's name and lump sum amount bid, as well as an executed Disclosure of Interest form attached to and made a part of the Small Project Construction Agreement.
- B. Successful bidder shall furnish the required Insurance Certificate meeting the attached requirements within five (5) working days of Notice of Award.
- C. All bid packages shall be submitted in a sealed envelope marked **Project: PROJECT NAME** \_\_\_\_\_, by no later than **2:00 p.m., Wednesday, DATE** addressed to:

City Secretary's Office  
City Hall - 1201 Leopard Street  
P. O. Box 9277  
Corpus Christi, TX 78469

'Angel R. Escobar, P.E.  
Director of Engineering Services

ARE:  
Attchs.

**Use when no Pre-Bid Meeting will be held**

Date

**NOTICE OF A SMALL PROJECT CONSTRUCTION CONTRACT**

**SUBJECT: Bid Package - Project Name (Project Number)**

Sealed Bids addressed to the City of Corpus Christi, Texas for a **Small Construction Project** will be received at the Office of the City Secretary until **2:00 p.m.**, **Wednesday, Bid Date**, and then publicly opened and read. Any bid received after closing time will be returned unopened. Small Construction Projects are those under \$25,000 and which require no bid bond.

Bid Packages may be obtained from the City's Department of Engineering Services located on the 3rd Floor of City Hall, or by calling 880-3500. No deposit is required when securing a bid package. The following will constitute a bidder's bid package:

- A. Bidders proposal shall include a Small Project Construction Agreement with an **original signature**. The contract will also state the contractor's name and lump sum amount bid, as well as an executed Disclosure of Interest form attached to and made a part of the Small Project Construction Agreement.
- B. Successful bidder shall furnish the required Insurance Certificate meeting the attached requirements within five (5) working days of Notice of Award.
- C. All bid packages shall be submitted in a sealed envelope marked **Project: PROJECT NAME**, by no later than **2:00 p.m., Wednesday, BID DATE** addressed to:

CITY SECRETARY'S OFFICE  
CITY HALL  
1201 LEOPARD STREET  
P. O. BOX 9277  
CORPUS CHRISTI, TX 78469

**Use when a Pre-Bid Meeting will be held.**

DATE

**TO:** Prospective Bidders  
**FROM:** 'Angel R. Escobar, P.E., Director of Engineering Services  
**SUBJECT:** **Bid Package - Project Name (Project Number)**

Attached you will find a Small Project Construction Agreement Bid Package for the above-referenced project. The following special instructions shall apply:

- A. Bidders proposal shall include a Small Project Construction Agreement with an **original signature**. The contract will also state the contractor's name and lump sum amount bid, as well as an executed Disclosure of Interest form attached to and made a part of the Small Project Construction Agreement.
- B. Successful bidder shall furnish the required Insurance Certificate meeting the attached requirements within five (5) working days of Notice of Award.
- C. A pre-bid conference will be held at                     LOCATION                     on DAY AND DATE, at TIME. The pre-bid conference will be conducted by CONSULTANT NAME.
- D. All bid packages shall be submitted in a sealed envelope marked **Project: PROJECT NAME**, by no later than **2:00 p.m., Wednesday, DATE** addressed to:

City Secretary's Office  
City Hall - 1201 Leopard Street  
P. O. Box 9277  
Corpus Christi, TX 78469

'Angel R. Escobar, P.E.  
Director of Engineering Services

ARE:  
Attchs.

Use when a Pre-Bid Meeting will be held.

Date

NOTICE OF A SMALL PROJECT CONSTRUCTION CONTRACT

**SUBJECT: Bid Package - Project Name (Project Number)**

Sealed Bids addressed to the City of Corpus Christi, Texas for a **Small Construction Project** will be received at the Office of the City Secretary until **2:00 p.m., Wednesday, Bid Date** \_\_\_\_\_, and then publicly opened and read. Any bid received after closing time will be returned unopened. Small Construction Projects are those under \$25,000 and which require no bid bond.

Bid Packages may be obtained from the City's Department of Engineering Services located on the 3rd Floor of City Hall, or by calling 880-3500. No deposit is required when securing a bid package. The following will constitute a bidder's bid package:

- A. Bidders proposal shall include a Small Project Construction Agreement with an **original signature**. The contract will also state the contractor's name and lump sum amount bid, as well as an executed Disclosure of Interest form attached to and made a part of the Small Project Construction Agreement.
- B. Successful bidder shall furnish the required Insurance Certificate meeting the attached requirements within five (5) working days of Notice of Award.  
requirements within five (5) working days of Notice of Award.

C. A pre-bid conference will be held at \_\_\_\_\_ **LOCATION** \_\_\_\_\_ on **DAY AND DATE** \_\_\_\_\_, at **TIME** \_\_\_\_\_. The pre-bid conference will be conducted by **CONSULTANT NAME**.

- D. All bid packages shall be submitted in a sealed envelope marked **Project: PROJECT NAME** \_\_\_\_\_, by no later than **2:00 p.m., Wednesday, BID DATE** \_\_\_\_\_ addressed to:

CITY SECRETARY'S OFFICE  
CITY HALL  
1201 LEOPARD STREET  
P. O. BOX 9277  
CORPUS CHRISTI, TX 78469

Sealed Bid Submission Deadline

Date:

Time:

Location: City Secretary's Office, First Floor City Hall  
1201 Leopard Street, Corpus Christi, TX 78401

**SMALL PROJECT CONSTRUCTION AGREEMENT**

THE STATE OF TEXAS §

KNOW ALL MEN BY THESE PRESENTS:

COUNTY OF NUECES §

This CONSTRUCTION AGREEMENT is between the City of Corpus Christi, Texas, a Texas home-rule municipal corporation ("CITY"), acting through its duly authorized City Manager or designee ("City Engineer"), and \_\_\_\_\_, ("CONTRACTOR"), acting through its duly authorized representative who is \_\_\_\_\_ (Name), \_\_\_\_\_ (Title), which agree as follows:

**WITNESSETH:**

1. The "CITY" hereby contracts with the "CONTRACTOR" to construct and complete certain improvements in accordance with the plans and specifications described in Exhibit "A" attached hereto and incorporated herein verbatim for all purposes. The "CONTRACTOR" agrees to do all work as provided in said plans and specifications and shall do such additional work as may be considered necessary to complete the work in a satisfactory and acceptable manner. The "CITY" reserves the right to make such changes in the plans and specifications and in the character of the work as may be necessary or desirable. Authorization for all changes shall be made in writing. The "CONTRACTOR" shall furnish all labor, tools, material, machinery, equipment and incidentals necessary to the prosecution of the work unless otherwise provided by the written terms of the plans and specifications.

2. The work described in Exhibit "A" shall be completed within NUMBER WORKING/CALENDAR DAYS of Notice to Proceed.

3. In consideration of the completion of the above described work, the "CITY" agrees to pay to "CONTRACTOR" the lump sum amount of \$\_\_\_\_\_, Said payment shall be conditioned upon the acceptance of the work by the "CITY" as certified by its final inspection following the receipt of notice from the "CONTRACTOR" that the work is completed and ready for acceptance. Upon completion of the work and before acceptance and final payment is made, the "CONTRACTOR" shall clean and remove from the work site all surplus and discarded materials, temporary structures, and debris of every kind in order to leave the work site in a neat, orderly condition, equal to that which originally existed. The "CONTRACTOR" shall submit a notarized affidavit that bills for all labor, equipment, materials, and supplies associated with this project have been paid before final payment is released.

4. All work shall be performed in a workmanlike manner and to the satisfaction of the "CITY". The "CITY" shall determine the quality and acceptability of materials furnished, work performed, manner of performance, rate of progress of the work, sequence of construction, and interpretation of the plans and specifications.

5. The "CONTRACTOR" agrees to comply with all insurance requirements as contained in Exhibit B (Insurance Requirements) and Notice To Contractors B (Worker's Compensation Coverage for Building or Construction Projects for government Entities).

6. The "CONTRACTOR" shall at all times observe and comply with all City, federal, state and county laws, ordinances or regulations which in any manner affect the conduit of the work. The Contractor shall be responsible for procuring all legally required building, plumbing, electrical, and other permits and licenses, pay all charges and fees, and give all notices necessary and incidental to the due and lawful prosecution of the work, unless otherwise provided by the written terms of the plans and specifications.

7. This Agreement or the work provided may not be assigned or subcontracted by "CONTRACTOR" without the written permission of the "CITY".

IN WITNESS WHEREOF this Agreement is executed in duplicate originals, both of equal force and effect.

CITY OF CORPUS CHRISTI, TEXAS

CONTRACTOR:

By \_\_\_\_\_  
- Authorized Agent - (Name)  
(Executive Dir. or Dept. Head)

\_\_\_\_\_  
\_\_\_\_\_  
(Date)

\_\_\_\_\_  
(Date)

By: \_\_\_\_\_  
**(ORIGINAL SIGNATURE)**

(Address)

FUNDING SOURCE:

(City, State, Zip)

\_\_\_\_\_

\_\_\_\_\_  
(Telephone Number)

FORM REVIEWED:

Date:

\_\_\_\_\_  
Director of Engineering Services

\_\_\_\_\_

\_\_\_\_\_  
Director of Risk Management

\_\_\_\_\_

**Acknowledgement of Addenda(s)**

(Revised January, 1998)



EXHIBIT "A"

PROJECT NAME (PROJECT NUMBER)

1. Scope of Services:

2. Time of Completion

The Contractor shall be prepared to begin work within ten (10) calendar days from the date of a formal Notice to Proceed (Work Order). All work shall be completed within NUMBER WORKING/CALENDAR DAYS from the date on the work order. For every working day used in excess of the working days specified herein, the Contractor shall be assessed \$ DOLLARS per day as liquidated damages.

3. City's Representative

For this project CITY REPRESENTATIVE NAME AND TITLE shall be the City's representative on all matters concerning the project. The City's Representative shall work with the contractor on matters affecting the program. All work shall be completed in a manner satisfactory and acceptable to the City representative as a strict requirement for fulfilling the contract.

4. Pre-Bid Conference

A pre-bid conference will be held at LOCATION, on DAY AND DATE at TIME. Pre-Bid will be conducted by CONSULTANT NAME.

**ANY DRAWINGS, ADDITIONAL TECHNICAL OR STANDARD SPECIFICATIONS  
AND/OR ANY OTHER REQUIREMENTS ARE ADDED BEHIND THIS PAGE.**

**Exhibit B  
(Revised October, 1997)**

**INSURANCE REQUIREMENTS**

**I. CONTRACTOR'S LIABILITY INSURANCE**

- A. The Contractor shall not commence work under this Agreement until he/she has obtained all insurance required herein and such insurance has been approved by the City. Nor shall the Contractor allow any subcontractor to commence work until all similar insurance required of the subcontractor has been so obtained.
- B. The Contractor shall furnish two (2) copies of certificates, with the City named as an additional insured, showing the following minimum coverage in an insurance company acceptable to the City.

TYPE OF INSURANCE	MINIMUM INSURANCE COVERAGE
<b>30-Day Notice of Cancellation required on all certificates</b>	<b>Bodily Injury and Property Damage</b>
Commercial General Liability including: 1. Commercial Form 2. Premises - Operations 3. Explosion and Collapse Hazard 4. Underground Hazard 5. Products/ Completed Operations Hazard 6. Contractual Insurance 7. Broad Form Property Damage 8. Independent Contractors 9. Personal Injury	\$2,000,000 COMBINED SINGLE LIMIT
AUTOMOBILE LIABILITY--OWNED NON-OWNED OR RENTED	\$1,000,000 COMBINED SINGLE LIMIT
WORKERS' COMPENSATION	WHICH COMPLIES WITH THE TEXAS WORKERS' COMPENSATION ACT AND PARAGRAPH II OF THIS EXHIBIT
EMPLOYERS' LIABILITY	\$100,000
EXCESS LIABILITY	\$1,000,000 COMBINED SINGLE LIMIT
PROFESSIONAL POLLUTION LIABILITY/ ENVIRONMENTAL IMPAIRMENT COVERAGE Not limited to sudden & accidental discharge; to include long-term environmental impact for the disposal of contaminants	\$2,000,000 COMBINED SINGLE LIMIT <input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED
BUILDERS' RISK	See Section B-6-11 and Supplemental Insurance Requirements <input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED
INSTALLATION FLOATER	\$100,000 Combined Single Limit See Section B-6-11 and Supplemental Insurance Requirements <input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED

- C. In the event of accidents of any kind, the Contractor shall furnish the City with copies of all reports of such accidents at the same time that the reports are forwarded to any other interested parties.

II. HOLD HARMLESS

- A. Contractor agrees to indemnify, save harmless and defend the City of Corpus Christi, and its agents, servants, and employees, and each of them against and hold it and them harmless from any and all lawsuits, claims, demands, liabilities, losses and expenses, including court costs and attorneys' fees, for or on account of any injury to any person, or any death at any time resulting from such injury, or any damage to any property, which may arise or which may be alleged to have arisen out of or in connection with the work covered by this contract. The foregoing indemnity shall apply except if such injury, death or damage is caused solely by the negligence or other fault of the City of Corpus Christi, its agents, servants, or employees or any other person indemnified hereunder.
  
- B. The Contractor shall obtain workers' compensation insurance coverage through a licensed insurance company or through self-insurance obtained in accordance with Texas law. If such coverage is obtained through a licensed insurance company, then the contract for coverage shall be written on a policy and endorsements approved by the Texas State Board of Insurance.

If such coverage is provided through self-insurance, then within ten (10) calendar days after the date the City requests that the Contractor sign the contract documents, the Contractor shall provide the City with a copy of its certificate of authority to self-insure its workers' compensation coverage, as well as a letter, signed by the Contractor, stating that the certificate of authority to self-insure remains in effect and is not the subject of any revocation proceeding then pending before the Texas Workers' Compensation Commission. Further, if at any time before final acceptance of the Work by the City, such certificate of authority to self-insure is revoked or is made the subject of any proceeding which could result in revocation of the certificate, then the Contractor shall immediately provide written notice of such facts to the City, by certified mail, return receipt requested directed to: City of Corpus Christi, Department of Engineering Services, P. O. Box 9277, Corpus Christi, Texas 78469 - Attention: Contract Administrator.

Whether workers' compensation insurance coverage is provided through a licensed insurance company or through self-insurance, the coverage provided must be in an amount sufficient to assure that all workers' compensation obligations incurred by the Contractor will be promptly met.

- C. **Builder's Risk Coverage:** Contractor will be responsible for providing builder's risk insurance coverage for the term of the contract up to and including the date the City finally accepts the project or work. Builder's risk coverage shall be an "All Risk" form. The policy shall be a completed value form. The Contractor shall provide such builder's risk coverage at least in the amount of \$ \_\_\_\_\_ ( \_\_\_\_\_ DOLLARS) which is estimated to be the value at completion of the real or personal property to be constructed, repaired or otherwise improved under the contract.

Contractor shall be responsible for paying all costs necessary to procure such builder's risk insurance coverage, including any deductible. The City shall be named an **additional** insured on any policy providing such insurance coverage.

III. On the certificate of insurance:

- o The **City of Corpus Christi** is to be named as an **additional insured** on the liability coverage, except for workers' compensation coverage.
- o Should your insurance company elect to use the standard ACORD form, the **cancellation clause** (bottom right) **shall be amended** by adding the wording "changed or" between "be" and "cancelled" and deleting the words "endeavor to" and the wording after "left". If the cancellation clause is not amended in the ACORD form, then **endorsements** shall be submitted.
- o The **name of the project** also needs to be listed under "description of operations".
- o At least **10-day written notice** of change or cancellation will be required.

IV. A completed **Disclosure of Interest** must be submitted with your proposal.



City of  
Corpus  
Christi

August 11, 2003


**TO:** Prospective Bidders  
**FROM:** 'Angel R. Escobar, P.E., Director of Engineering Services  
**SUBJECT:** **Bid Package – Rincon Channel Drainage Ditches Maintenance - REBID**  
**Project Nos. 2192/8446**

---

Attached you will find a Small Project Construction Agreement Bid Package for the above-referenced project. The following special instructions shall apply:

- A. Bidders proposal shall include a Small Project Construction Agreement with an **original signature**. The contract will also state the contractor's name and lump sum amount bid, as well as an executed Disclosure of Interest form attached to and made a part of the Small Project Construction Agreement.
- B. Successful bidder shall furnish the required Insurance Certificate meeting the attached requirements within five (5) working days of Notice of Award.
- C. All bid packages shall be submitted in a sealed envelope marked **Project: Rincon Channel Drainage Ditches Maintenance - REBID**, by no later than **2:00 p.m., Wednesday, August 20, 2003**, addressed to:

City Secretary's Office  
City Hall - 1201 Leopard Street  
P. O. Box 9277  
Corpus Christi, TX 78469

  
'Angel R. Escobar, P.E.  
Director of Engineering Services

ARE:hmm  
Attchs.



8/12/03

**SMALL CONSTRUCTION CONTRACT  
SAMPLE CONTRACT PACKAGE**

Page 1 of 55

New Document: Dec. 2004



City of  
Corpus  
Christi

Sealed Bid Submission Deadline

Date: Wednesday, August 20, 2003

Time: 2:00 PM

Location: City Secretary's Office, First Floor City Hall  
1201 Leopard Street, Corpus Christi, TX 78401

SMALL PROJECT CONSTRUCTION AGREEMENT

THE STATE OF TEXAS §

KNOW ALL MEN BY THESE PRESENTS:

COUNTY OF NUECES §

This CONSTRUCTION AGREEMENT is between the City of Corpus Christi, Texas, a Texas home-rule municipal corporation ("CITY"), acting through its duly authorized City Manager or designee ("City Engineer"), and \_\_\_\_\_, ("CONTRACTOR"), acting through its duly authorized representative who is \_\_\_\_\_ (Name), \_\_\_\_\_ (Title), which agree as follows:

WITNESSETH:

1. The "CITY" hereby contracts with the "CONTRACTOR" to construct and complete certain improvements in accordance with the plans and specifications described in Exhibit "A" attached hereto and incorporated herein verbatim for all purposes. The "CONTRACTOR" agrees to do all work as provided in said plans and specifications and shall do such additional work as may be considered necessary to complete the work in a satisfactory and acceptable manner. The "CITY" reserves the right to make such changes in the plans and specifications and in the character of the work as may be necessary or desirable. Authorization for all changes shall be made in writing. The "CONTRACTOR" shall furnish all labor, tools, material, machinery, equipment and incidentals necessary to the prosecution of the work unless otherwise provided by the written terms of the plans and specifications.

2. The work described in Exhibit "A" shall be completed within **20 calendar days** of Notice to Proceed.

3. In consideration of the completion of the above described work, the "CITY" agrees to pay to "CONTRACTOR" the lump sum amount (Total Base Bid) **for the Contractor to provide the necessary equipment, material, labor, and supervision to clean, excavate and grade existing drainage ditches and remove and dispose of excess material as described in Exhibit "A" including Attachment No. 1 – Specifications, Attachment No. 2 – TXDOT Permit, Attachment No. 3 – Traffic Control Plans, and Attachment No. 4 – Corps of Engineers (COE) Permit.** Said payment shall be conditioned upon the acceptance of the work by the "CITY" as certified by its final

Rincon Channel Drainage Ditches Maintenance - REBID (Project No. 2192/8446) - Agreement

Page 1 of 3

**SMALL CONSTRUCTION CONTRACT  
SAMPLE CONTRACT PACKAGE**

Page 2 of 55

**New Document: Dec. 2004**

Engineering Services

P.O.Box 9277 • Corpus Christi, Texas 78469-9277 • (361) 880-3500

inspection following the receipt of notice from the "CONTRACTOR" that the work is completed and ready for acceptance. Upon completion of the work and before acceptance and final payment is made, the "CONTRACTOR" shall clean and remove from the work site all surplus and discarded materials, temporary structures, and debris of every kind in order to leave the work site in a neat, orderly condition, equal to that which originally existed. The "CONTRACTOR" shall submit a notarized affidavit that bills for all labor, equipment, materials, and supplies associated with this project have been paid before final payment is released.

I	II	III	IV
BID ITEM	QTY & UNIT	DESCRIPTION	BID ITEM EXTENSION (QTY X UNIT PRICE IN FIGURES)
1.	1 LUMP SUM	Cleaning, excavating & grading ditches at culverts "I", "J", "K" & "L", complete in place, lump sum.	\$ _____
2.	1 LUMP SUM	Cleaning, excavating & grading ditch "M" including three (3) 36" RCP outfalls, complete in place, lump sum.	\$ _____

**Total Base Bid (Item 1 + Item 2):** \$ \_\_\_\_\_

4. All work shall be performed in a workmanlike manner and to the satisfaction of the "CITY". The "CITY" shall determine the quality and acceptability of materials furnished, work performed, manner of performance, rate of progress of the work, sequence of construction, and interpretation of the plans and specifications.

5. The "CONTRACTOR" agrees to comply with all insurance requirements as contained in Exhibit B (Insurance Requirements) and Notice To Contractors B (Worker's Compensation Coverage for Building or Construction Projects for government Entities).

6. The "CONTRACTOR" shall at all times observe and comply with all City, federal, state and county laws, ordinances or regulations which in any manner affect the conduit of the work. The Contractor shall be responsible for procuring all legally required building, plumbing, electrical, and other permits and licenses, pay all charges and fees, and give all notices necessary and incidental to the due and lawful prosecution of the work, unless otherwise provided by the written terms of the plans and specifications. (All requirements of Corps of Engineers Permit shall strictly be adhered to.)

7. This Agreement or the work provided may not be assigned or subcontracted by "CONTRACTOR" without the written permission of the "CITY".

IN WITNESS WHEREOF this Agreement is executed in duplicate originals, both of equal force and effect.

CITY OF CORPUS CHRISTI, TEXAS

CONTRACTOR:

By \_\_\_\_\_  
Authorized Agent - (Name)  
(Executive Dir. or Dept. Head)

\_\_\_\_\_  
\_\_\_\_\_  
(Date)

\_\_\_\_\_  
(Date)

By: \_\_\_\_\_  
**(ORIGINAL SIGNATURE)**

FUNDING SOURCE:  
\_\_\_\_\_

\_\_\_\_\_  
(Address)  
\_\_\_\_\_  
(City, State, Zip)  
\_\_\_\_\_  
(Telephone Number)

FORM REVIEWED:

Date:  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
Director of Engineering Services

\_\_\_\_\_  
Director of Risk Management

---

**Acknowledgement of Addenda(s)**

(Revised January, 1998)



**EXHIBIT "A"**  
**Rincon Channel Drainage Ditches Maintenance - REBID**  
**Project Nos. 2192/8446**

**1. Scope of Services**

The intent of this project is for the Contractor to provide the necessary equipment, material, labor, and supervision to clean and excavate existing drainage ditches and culverts and grade existing drainage ditches, and remove and dispose of excess material and complete the work to the satisfaction of the City's Engineering Department as described in Exhibit "A".

- **Exhibit A, page 5 shows on a map of part of North Beach the locations of all the work sites.**
- **Exhibit A, page 6 provides a Table of Ditch Sizes and Estimated Quantities.**

**All work shall comply with the attached Specifications (Attachment No. 1), the TXDOT Permit (Attachment No. 2), the Traffic Control Plans (Attachment No. 3), and the Corps of Engineers Permit (Attachment No.4).**

**2. Description of Work**

**Note: This contract does not include work on ditches A, B, C, D, E, F, G, or H.**

**A. Ditches "T", "J", "K", & "L"**

**1) Ditch shaping**

- The new trapezoidal cross-sections for the outfall ditches are all to have bottom widths of 8 feet.
- The elevation of the ditch bottom is to match the elevation of the culvert outfall pipe flowline. The side slopes are to be 2 horizontal to 1 vertical (or steeper) from the proposed bottom flowline to the point on the side slope where the elevation is the same as that of the top of the adjacent existing ground surface elevation.
- The proposed ditch flowlines are to be flat or slightly sloping to provide positive drainage.

**2) Work Area Limits**

- Prior to the start of construction maintenance at each of the outfall ditches, a rectangular perimeter will be staked out by the City's Consultant (Shiner, Moseley & Associates, Inc.) to define the Work Area Limits for the Contractor's equipment; this will be the only area at each ditch where construction equipment will be allowed. Each rectangle will be

approximately 20 feet wide and extend from the back of curb on the west side feeder road (SH 181) to the western limit of the ditch excavation.

- The southern boundary of each Work Area will be not more than 12 feet from the centerline of the adjacent ditch.
- A majority of the Work Area will be within the wetlands. Another staked line will define the eastern edge of the wetlands. Within the wetlands portion of the Work Area, no equipment will be allowed without first placing work mats to protect the native vegetation. The Contractor shall not enter the Work Area for any ditch maintenance until the City has approved the staking of the Work Area and of the Wetland.
- Work mats will be set in place. Dragging of work mats will not be allowed.
- At each Work Area the work mats shall be removed not later than 48 hours after their installation began.

#### B. Ditch "M" and Three (3) 36" Culverts

##### 1) Ditch shaping

- The new trapezoidal cross-section for the ditch at "M" is to have a bottom width of 5 feet.
- The elevation of the ditch bottom is to match the elevation of the flowline of the dual 18" culverts at the east end and to slope uniformly down to the flowline of the 36" culverts at the west end.

##### 2) Three (3) – 36" Culverts

- Provide cleaning of each separate 30' long culvert (total of 3 culverts).

##### 3) Work Area Limits

- The side slopes are to be 2.5 horizontal to 1 vertical at the east end transitioning to 1.25 horizontal to 1 vertical at the west end.
- The contractor may use the southern lane of Burleson Street, but must provide for one-way reversing traffic flow along the north lane at the work site in accordance with the Traffic Control Plans, Attachment No. 3.

C. Only Gradall Type of Excavator Equipment will be allowed on all work.

### 3. Time of Completion

The Contractor shall be prepared to begin work within ten (10) calendar days from the date of a formal Notice to Proceed (Work Order). All work shall be completed within twenty (20) calendar days from the date on the work order. For every working day used in excess of the working days specified herein, the Contractor shall be assessed \$50.00 per day as liquidated damages.

4. City's Representative

For this project Lynda Kahn, Shiner Moseley and Associates, Inc. (the Consultant) shall be the City's representative on all matters concerning the project. The City's Representative shall work with the contractor on matters affecting the program. All work shall be completed in a manner satisfactory and acceptable to the City representative as a strict requirement for fulfilling the contract.

5. Pre-bid Conference

There will be no pre-bid conference for this project. The sites are readily visible from the feeder road (West Causeway Blvd.) on the west side of SH181. Please contact Mr. Joseph Cavalier, P.E. (telephone 361-880-3598).

6. Work Schedule

Work shall be scheduled during regular work hours (Monday – Friday, 7:00am to 6:00pm) unless approval of different hours is received from the City Representative, in advance.

7. Bid Evaluation Award/Payment

The bids will be evaluated based on **Total Base Bid (Item 1 + Item 2)**; subject to the availability of funds.

The City reserves the right to reject any or all bids, to waive irregularities and to accept the bid which, in the City's opinion, is most advantageous to the City and in the best interest of the public.

8. Pre-construction Conference

A pre-construction meeting will be scheduled upon contract award.

9. Clean-up and Disposal

Each work area must be kept clean of trash and debris at all times. The Contractor shall be responsible for removal, hauling and legal disposal of the demolition debris, forms, and any other material occasioned by this project. Prior to any vehicle or mobile equipment leaving the Work Area, any significant sediment accumulation on the tires, wheels, or Gradall bucket shall be removed by water wash, broom, etc. At the end of each work day, any sediment deposits found along the adjacent pavement of SH 181, between Ditch I and Burluson Street, shall be loosened and collected with broom and pan by the Contractor and added to the other excess excavation material for proper disposal offsite. All costs shall be subsidiary to the contract.

10. Project Close-out

The contractor shall submit a notarized affidavit, in City format, that all bills for labor, equipment materials, and supplies associated with this project have been paid before the final payment is released.

11. Crossing Pipeline

The El Paso Pipeline Company (telephone 1-800-895-2396) has an 8" Shuttle Line (carrying petroleum products) crossing some of these ditches. This company must be contacted prior to any excavation and approval received prior to any excavation.

The Contractor shall be responsible to contact all other utilities which affect this project.

12. Storm Water Pollution Prevention Measures

For each staked Work Area, a silt barrier shall be provided:

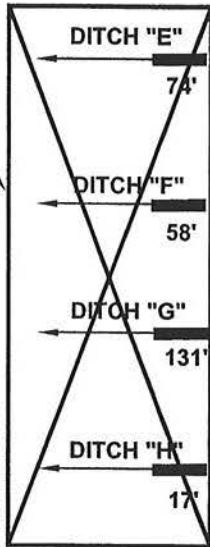
- Use hay bales wrapped in heavy duty black polyethylene sheeting along each side of the Work Area, except, the East boundary, located along the feeder road.
- Use fabric silt fencing across the water end of the proposed ditch excavation limit. The fencing shall remain in place until project completion and be removed upon project acceptance.



1" = 500'+

NOT IN REBID CONTRACT

RINCON CHANNEL "A"



W. CAUSEWAY BLVD.

E. CAUSEWAY BLVD.

EXISTING STORM SEWER (TYF.)

BEACH AVE

HAYES ST

NEAL ST

GULFSPRAY AVE

SURFBOARD AVE

TREASURE AVE

TOURIST AVE

ST. CHARLES ST

STEWART PL

BUSHICK PL

CHURCHDALE AVE

BREAKER AVE

BREAKER AVE

SEIGLER

HOTEL PL SO.

AVENUE H

BURLESON ST

DITCH "M" 110'

EXISTING 36" R.C.P. EACH 30' LONG (CLEAN OUT INTERIOR OF EACH PIPE)

DUAL 18" CULVERTS

16TH STREET

15TH STREET

U. S. HIGHWAY 181

SEAGULL BLVD.

SURFSIDE BLVD

GULFBREEZE BLVD

CORPUS CHRISTI BAY

DITCH A, B, C AND D NOT IN CONTRACT

SMALL CONSTRUCTION CONTRACT SAMPLE CONTRACT PACKAGE

Page 9 of 55

New Document: Dec. 2004

REBID  
RINCON CHANNEL DRAINAGE DITCHES MAINTENANCE  
PROJECT NO. 2192/8446  
LOCATION MAP

CITY OF CORPUS CHRISTI, TEXAS  
DEPARTMENT OF ENGINEERING SERVICES  
DATE: 4/7/03

EXHIBIT "A"  
Page 5 of 6



**EXHIBIT "A"**  
**Rincon Channel Drainage Ditches Maintenance - REBID**  
**Project Nos. 2192/8446**

TABLE OF DITCH SIZES AND ESTIMATED QUANTITIES

<u>Ditch at Point</u>	<u>Bottom Width LF</u>	<u>Side Slopes Horizontal to Vertical</u>	<u>Length LF</u>	<u>Estimated Disposal Quantity CY</u>
I	8	2 to 1	30'	13
J	8	2 to 1	40'	18
K	8	2 to 1	175'	52
L	8	2 to 1	180'	53
M ditch	5	varies	110'	23
M (3 culverts) (3 culverts (interior cleaning))	NA	NA	90' total	16

# **ATTACHMENT NO. 1**

## **SPECIFICATIONS**

# Specifications for Minor Drainage Ditch Grading

## 1. General

This specification shall cover the grading of minor drainage ditches and culvert cleaning and shall include items required to complete the work to the satisfaction of the City Engineering Department. The ditches to be graded under this specification will generally include minor drainage ditches of four (4) to six (6) foot or less, in depth, measured from the ditch flowline to the top of the ditch bank.

It is the intent of this specification to provide as many general guidelines and details as is possible for the scope of the work. However, conditions and/or circumstances may arise that are not generally or specifically covered under this specification. In these events, the Engineering Department shall review the situation and render a decision.

For the purpose of this specification, the term "Grading" shall include, but not be limited to:

- a. The removal and disposal of all trash, brush, hazardous materials, debris, etc. that may be present within the limits of the work area. All removal and disposal shall be done in accordance with all local, state and federal laws for removal and disposal for the particular materials.

## 2. Preliminary Scope of Work

The contractor shall be required to:

- a. Visit and investigate each roadside ditch to determine the scope of work at each location;
- b. Provide all personnel and equipment to survey each ditch segment to provide proper line and grade for all cleaning operations;
- c. Evaluate and determine methods for protecting any existing improvements and/or private property within the limits of the work area;
- d. Determine the locations of all existing underground utilities, both horizontally and vertically to be protected within the limits of the work area;
- e. Provide prior written notice to all abutting property owners about the cleaning operations a minimum of five (5) calendar days for the property owners to remove any parked vehicles and other wanted items that will hamper ditch grading operations.
- f. Identify locations where property owners have "manicured" the roadside ditches. "Manicured" basically means that the ditches have well-established grass and/or ground cover that is regularly maintained by the property owner. Decisions whether or not to excavate in these areas will be on case-by-case basis. In these areas, the contractor will be required to determine the depth of any needed excavation to establish grade and



proper side slope. The contractor will present this information to the representative of the City's Engineering Department for evaluation and a decision.

### **3. Cleaning Operations Scope of Work**

During actual grading operations, the contractor shall be required to:

- a. Excavate the ditch to an established grade. Use of "Gradall" type equipment is required. Type of equipment to be used shall be approved by the Engineer prior to construction.
- b. Provide traffic control, signage and barricading which satisfies the Traffic Control Plans and is approved by the City's Traffic Engineering Activity.
- c. For the three (3) 36" culverts location at ditch "M", clean all the interior of the culverts of all mud, silt, debris, etc. so as to leave the culverts completely open for free flow. In the event that unusual obstructions or culvert conditions are encountered, the Engineer shall be contacted to view the situation and make a determination as to how the contractor shall proceed.
- d. Protect all fixed items such as fire hydrants, sign posts, inlet structures, pipe ends, headwalls, etc. from any damage during excavation operation.
- e. Provide a ditch bottom width per the description in Exhibit "A".
- f. Provide ditch side slopes no steeper than two (2) foot horizontal to one (1) foot vertical unless steeper slopes are required by Exhibit "A". If specific locations will not allow this side slope because of obstacles, limited area between the edge of roadway and the property line, etc., the contractor shall notify the Engineer. The Engineer shall then establish the acceptable limits of excavation and side slopes.
- g. Remove all materials (i.e. mud, silt, dirt, trash, debris, etc.) from the work site on a daily basis. All these materials are the property of the contractor for disposal in accordance with all local, state and federal regulations.
- h. Coordinate operations with other organizations (i.e. City of Corpus Christi, franchise utilities, TxDOT, Corps of Engineers).

### **4. Equipment and Personnel**

The contractor shall be required to provide equipment and personnel such that:

- a. All excavation equipment shall have a smooth-edged bucket. Buckets shall not have teeth. The contractor will be allowed to weld steel bars across toothed buckets to create a smooth edge. Excavators with steel tracks will not be permitted to run across road pavement.
- b. Sufficient haul trucks are available so that all materials can be deposited directly into trucks. No stockpiling of materials will be permitted on roadways, driveways, or any other improved surface area.
- c. Personnel are available to act as flagmen for traffic on a full-time basis to insure safe traffic conditions per the Traffic Control Plans.

- d. When not in use, no equipment, signage, barricading, materials, etc. shall be stored or parked within TxDOT right-of-way. It shall be the contractor's responsibility to make his own arrangements for such items satisfactory, and with the approval of, the Engineer.

## **5. Incidental or Other Requirements**

The contractor shall be required to:

- a. Promptly address any complaints, inquiries, or permitting issues. If the situation cannot be resolved, the contractor shall notify the designated representative from the City's Engineer to mediate the situation.
- b. Regularly (weekly), meet with the representative from the City's Engineering Department to discuss progress, scheduling, special concerns, working days charged, rain days, etc.
- c. Prepare, complete and submit to the Engineer documents as follows:
  1. Identification of each ditch section cleaned.
  2. Description of any trash, debris or hazardous materials removed and their final disposition, including approximate quantity.
  3. Approximate time spent to clean each section.

This documentation shall be submitted to the Engineer on a weekly basis.

## **6. Measurement and Payment**

Prior to the contractor requesting payment, he shall contact the Engineer for inspection of all work requested for payment. If any work is found to be unacceptable, the contractor shall correct any deficiencies prior to submittal of the request for payment.

Measurement and payment for all work shall be by lump sum per completed items shown in Exhibit "A" and as stated in the proposal and agreement. This shall be full compensation for all labor, equipment, materials, incidentals, etc. for satisfying all requirements of the contract.

**ATTACHMENT NO. 2**

**TXDOT PERMIT**



# Texas Department of Transportation

May 19, 2003

Corpus Christi District  
RE: Rincon Channel Drainage  
Control: 101-6  
Nueces County  
US 181

Angel R. Escobar, P.E.  
City of Corpus Christi  
P.O. 9907  
Corpus Christi, TX 78401

Dear Mr. Escobar:

This is in response to your request of May 15, 2003, for the purpose of performing maintenance on the Rincon Channel Drainage System within the right-of-way of US 181. We offer no objection to the maintenance procedure at the location as outlined in your request, if you agree to the following conditions:


1. It is expressly understood that except as set forth herein, the State does not purport hereby to grant any right, claim, title, or easement in or upon this highway.
2. The maintenance process shall be conducted in compliance with all governing laws and State regulations and policies.
3. Storm water pollution preventative measures shall be in place to prevent debris and mud from entering on the roadway adjacent to operation site. At the end of every work day, construction equipment and materials shall be removed as far from the roadway edges as feasible. When the maintenance operation is complete, the right-of-way shall be reshaped to its original condition or better and the area reseeded or resodded to reduce erosion.

**SMALL CONSTRUCTION CONTRACT  
SAMPLE CONTRACT PACKAGE**


**Page 16 of 55**

**New Document: Dec. 2004**

4. The maintenance shall be performed in such a manner so as to minimize inconvenience to or interference with highway traffic. Any traffic control devices required shall be installed in accordance with the Texas Manual on Uniform Traffic Control Devices for Streets and Highways. As a minimum, "Road Work Ahead" signs shall be placed on each side of your operations for each direction of travel except on multi-lane divided highways, then signs can be placed only on the side you are doing work.
5. The City of Corpus Christi shall hold the State harmless against any action by any parties, including the traveling public, for personal injury or property damage related to the maintenance of Rincon Channel Drainage System.
6. You shall further indemnify the State and accept responsibility for all damages or injury to property of any character, including utilities, occurring during the prosecution of the maintenance resulting from any act, omission, neglect or misconduct on your part in the manner or method of executing the maintenance to Rincon Channel Drainage System.
7. Your attention is directed to the fact that utility installations owned by others exist in the right-of-way. You shall provide adequate notice of the proposed maintenance to all utility companies potentially impacted by the investigations.
8. Prior to termination of this Agreement, you shall restore the right-of-way to its original condition, free of any right-of-way damage, including ruts or any other injury to the highway right-of-way, necessary restoration/remediation work will be billed to you at cost.
9. Please notify Mr. Jim Jennings, Maintenance Construction Supervisor, at 361-289-1400 forty-eight (48) hours prior to beginning work in his area of responsibility.

  
\_\_\_\_\_  
Victor Piñon, Jr, P.E.  
Director of Maintenance

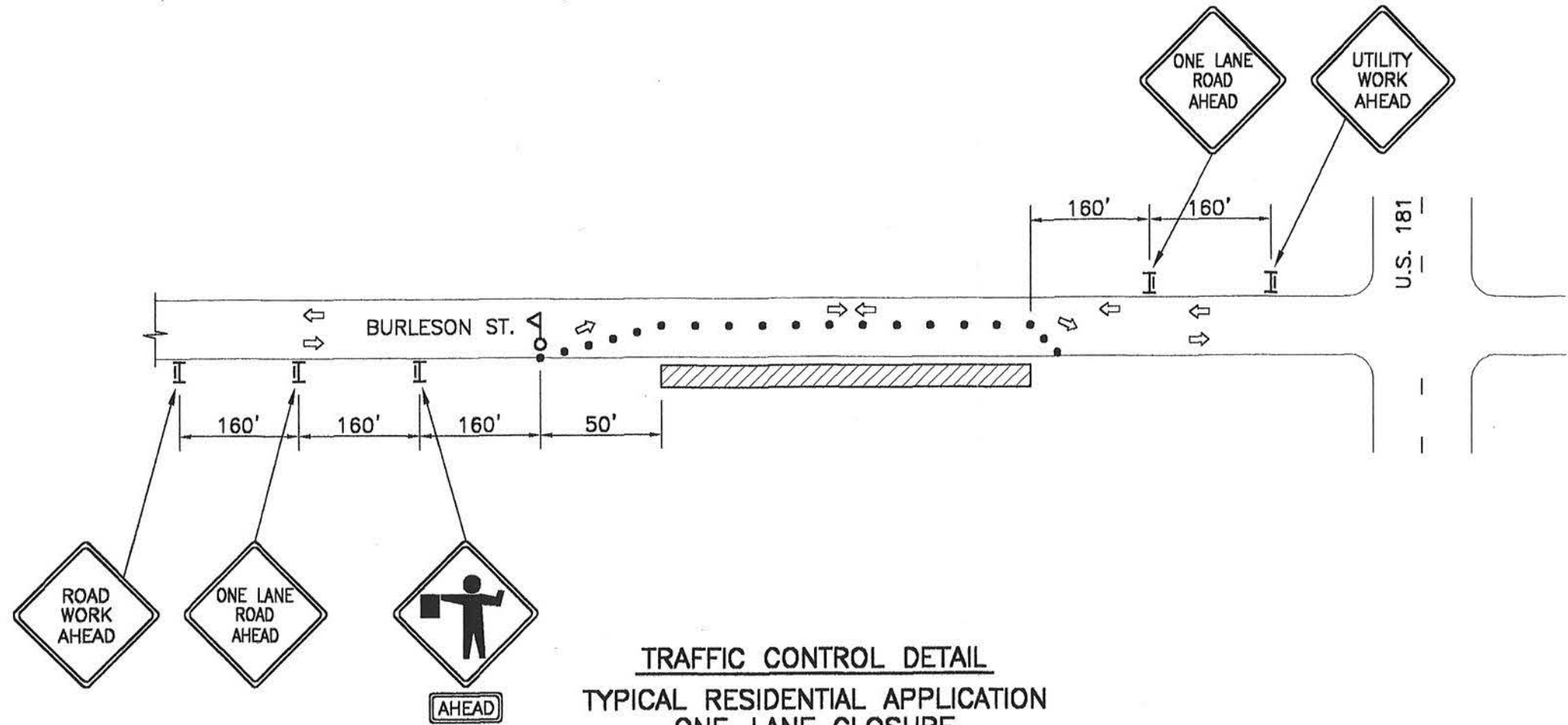
I (We) the undersigned am (are) fully aware and accept the above.

  
\_\_\_\_\_  
Authorized Signature for  
The City of C  
Dir OF

**ATTACHMENT NO. 3**

**TRAFFIC CONTROL**

**PLANS**



**TRAFFIC CONTROL DETAIL**  
**TYPICAL RESIDENTIAL APPLICATION**  
**ONE-LANE CLOSURE**  
**FLAG PERSON CONTROLLED**

**SPECIAL CONDITIONS:**

THE FOLLOWING SPECIAL CONDITIONS OUTLINE THE MINIMUM REQUIREMENTS ASSOCIATED WITH THIS TRAFFIC CONTROL PLAN FOR THE RINCON CHANNEL DRAINAGE IMPROVEMENTS.

**NOTE:**

ALL TRAFFIC CONTROL DEVICES SHALL CONFORM WITH CITY AND STATE SPECIFICATIONS IN ACCORDANCE WITH THE 2003 TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND SUBSEQUENT REVISIONS.

1. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN ALL TRAFFIC CONTROL DEVICES DURING THE COURSE OF THE CONSTRUCTION PERIOD.
2. EQUIPMENT AND MATERIALS SHALL NOT BE STORED ON RIGHT-OF-WAY AT ANY TIME DURING THE COURSE OF THE CONSTRUCTION PERIOD. ANY MATERIALS AND EQUIPMENT APPROVED BY THE CITY ENGINEER FOR TEMPORARY PLACEMENT ALONG THE PUBLIC RIGHT-OF-WAY SHALL BE ADEQUATELY BARRICADED WITH TYPE II BARRICADES FOR EACH DIRECTION OF TRAVEL AND SHALL IN NO CASE BE PLACED WITHIN FIVE (5) FEET FROM THE EDGE OF THE STREET PAVEMENT.
3. THE CONTRACTOR SHALL MAINTAIN ALL TRAFFIC SIGNS DURING THE CONSTRUCTION PERIOD.
4. CONSTRUCTION WARNING SIGNS MAY BE MOUNTED ON PORTABLE DEVICES.
5. SHOULD ANY TRAFFIC SIGN, SIGN POST OR ITS FOUNDATION BE DAMAGED, CONTRACTOR SHALL REPORT SUCH INFORMATION IMMEDIATELY TO THE ATTENTION OF THE CITY'S STREET DEPARTMENT AT (857-1940).
6. THE CONTRACTOR SHALL PROVIDE ACCESS TO ALL RESIDENTIAL DRIVEWAYS.

**KEY:**

- 8' TYPE III BARRICADE
- CONSTRUCTION WARNING SIGNS
- TYPE 'B' TRAILER MOUNT FLASHER
- FLAG PERSON
- REFLECTORIZED DRUM
- REFLECTORIZED DRUM W/ WARNING SIGN
- DIRECTION OF TRAVEL
- CONSTRUCTION AREA

SMALL CONSTRUCTION CONTRACT  
 SAMPLE CONTRACT PACKAGE  
 Page 19 of 55  
 New Document: Dec. 2004

**CITY OF CORPUS CHRISTI TEXAS**  
 Department of Engineering Services  
 Traffic Engineering Division

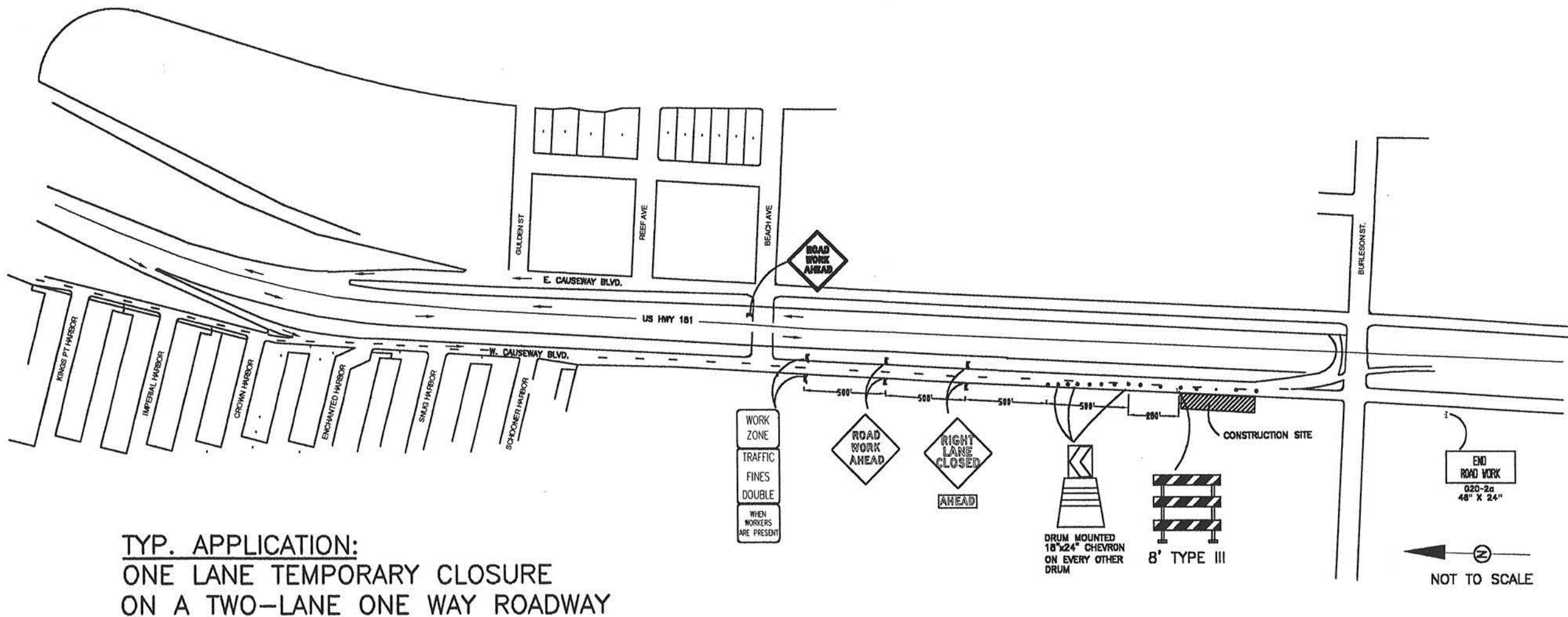
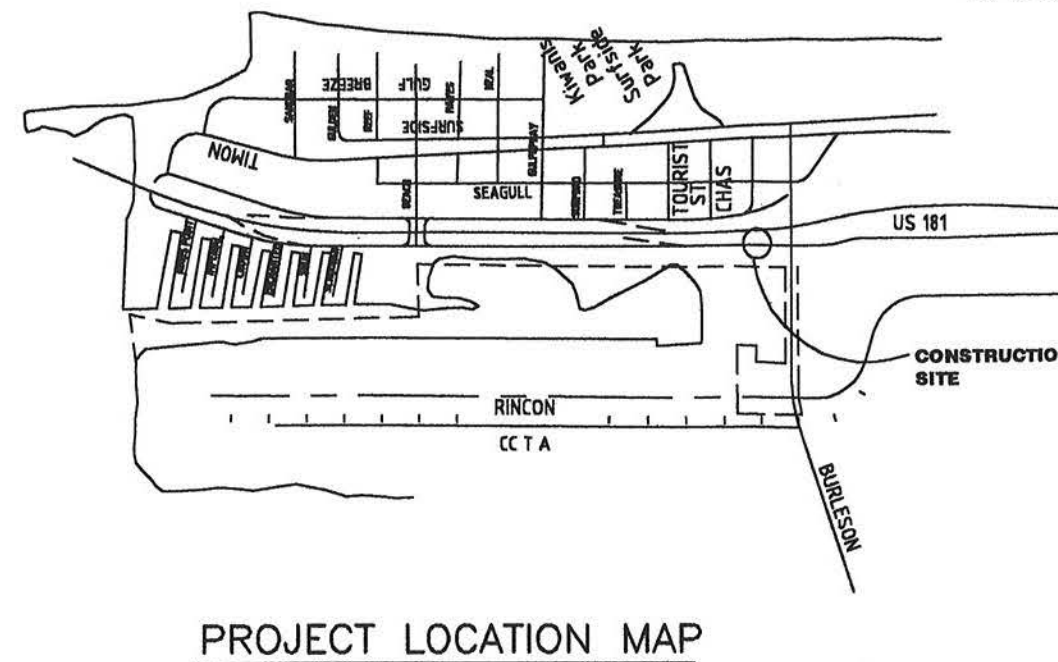
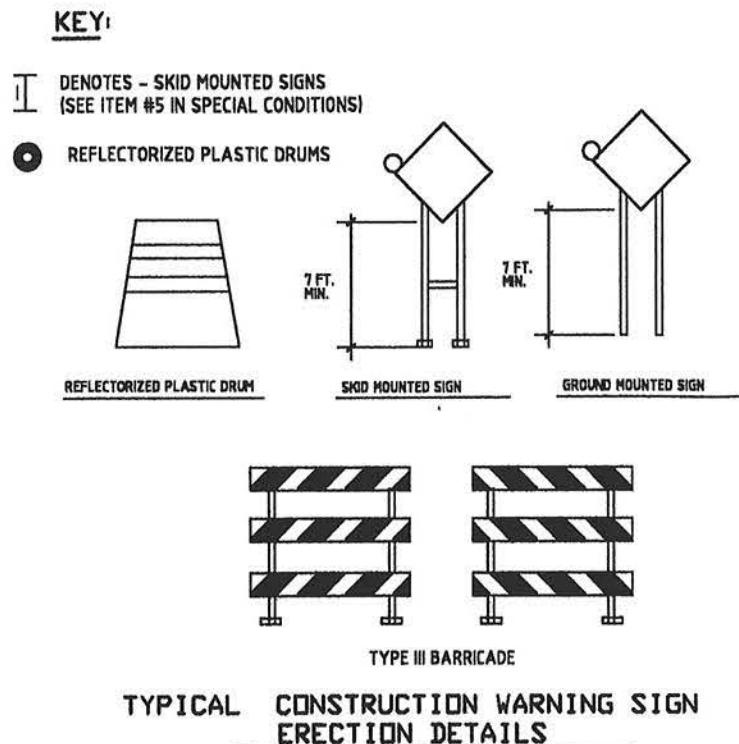
RINCON CHANNEL DRAINAGE  
 DITCHES MAINTENANCE  
 TRAFFIC CONTROL PLAN

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**SPECIAL CONDITIONS:**  
THE FOLLOWING SPECIAL CONDITIONS OUTLINE THE MINIMUM REQUIREMENTS ASSOCIATED WITH THIS TRAFFIC CONTROL PLAN FOR THE RINCON CHANNEL DRAINAGE DITCHES MAINTENANCE.

**NOTE:**  
ALL TRAFFIC CONTROL DEVICES SHALL CONFORM WITH CITY AND STATE SPECIFICATIONS IN ACCORDANCE WITH THE 2003 TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

1. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN ALL TRAFFIC CONTROL DEVICES DURING THE COURSE OF THE CONSTRUCTION PERIOD.
  2. EQUIPMENT AND MATERIALS SHALL NOT BE STORED ON RIGHT-OF-WAY AT ANY TIME DURING THE COURSE OF THE CONSTRUCTION PERIOD. ANY MATERIALS AND EQUIPMENT APPROVED BY THE CITY ENGINEER FOR TEMPORARY PLACEMENT ALONG THE PUBLIC RIGHT-OF-WAY SHALL BE ADEQUATELY BARRICADED WITH TYPE III BARRICADES FOR EACH DIRECTION OF TRAVEL AND SHALL IN NO CASE BE PLACED WITHIN FIVE (5) FEET FROM THE EDGE OF THE STREET PAVEMENT.
  3. THE CONTRACTOR SHALL MAINTAIN ALL TRAFFIC SIGNS DURING THE CONSTRUCTION PERIOD.
  4. CONSTRUCTION WARNING SIGNS MAY BE MOUNTED ON PORTABLE SIGN SUPPORT SYSTEMS. SEE ATTACHED BC (5) 03 SHEET
  5. CONTRACTOR SHALL RELOCATE TRAFFIC CONTROL DEVICES OFF OF TRAVEL LANES DURING NON-WORKING HOURS.
- POSTED SPEED LIMIT FOR SOUTHBOUND CAUSEWAY FRONTAGE RD. IS 45 MPH.



NOT TO SCALE

APPROVED:	CITY TRAFFIC ENGINEER
DATE:	
DESIGN: C.J.R.	NOTED
DRAWING: B.D.R./A.D.	NOTED
CHECK: D.V.S.	
REVISION NO.	
	BY
	DATE

**CITY OF CORPUS CHRISTI TEXAS**  
Department of Engineering Services  
Traffic Engineering Division

RINCON CHANNEL DRAINAGE  
DITCHES MAINTENANCE

TRAFFIC CONTROL PLAN

**SMALL CONSTRUCTION CONTRACT SAMPLE CONTRACT PACKAGE**  
Page 20 of 55  
New Document: Dec. 2004

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**TYPE III BARRICADES**

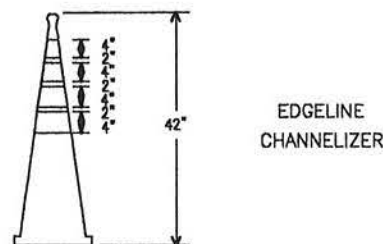
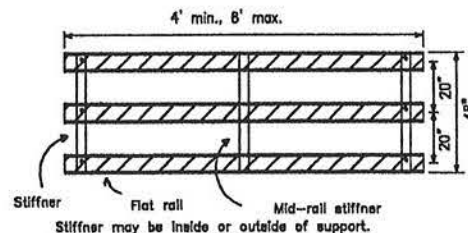
- Refer to the Compliant Work Zone Traffic Control Devices List (CWZTCD) for details of the Type III Barricades and a list of all materials used in the construction of Type III Barricades.
- Type III Barricades shall be used at each end of construction projects closed to all traffic.
- Barricades extending across a roadway should have stripes that slope downward in the direction toward which traffic must turn in detouring. When both right and left turns are provided, the chevron striping may slope downward in both directions from the center of the barricade.
- Striping of rolls, for the right side of the roadway, should slope downward to the left. For the left side of the roadway, striping should slope downward to the right.
- Identification markings may be shown only on the back of the barricade rolls. The maximum height of letters and/or company logos used for identification shall be 1".
- Barricades shall not be placed parallel to traffic unless an adequate clear zone is provided.
- Warning lights shall NOT be installed on barricades.
- Where barricades require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand is recommended. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight. Rock, concrete, iron, steel or other solid objects will NOT be permitted. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall not be used for sandbags. Sandbags shall only be placed along or upon the base supports of the device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners.

Barricades shall NOT be used as a sign support.

**TYPICAL STRIPING DETAIL FOR BARRICADE RAIL**

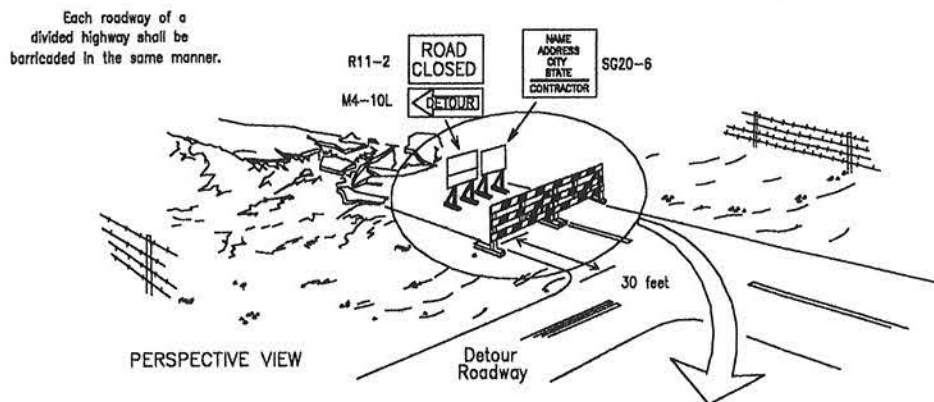


**TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES**



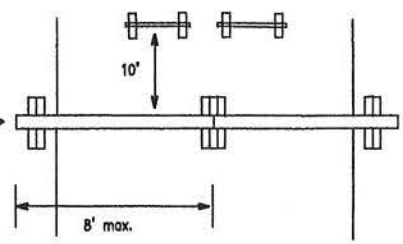
- This device is intended only for use in place of a vertical panel to channelize traffic by indicating the edge of the travel lane.
- This device shall not be used to separate lanes of traffic (opposing or otherwise) or warn of objects.
- This device is based on a 42 inch, two-piece cone with an alternate striping pattern: four 4 inch retroreflective bands, with an approximate 2 inch gap between bands. The color of the band should correspond to the color of the edgeline (yellow for left edgeline, white for right edgeline) for which the device is substituted or for which it supplements. The reflectorized bands shall be retroreflective Type C (High Specific Intensity) conforming to Departmental Material Specification DMS-8300, unless otherwise noted.
- The base must weigh a minimum of 30 lbs.

**TYPE III BARRICADE (POST AND SKID) TYPICAL APPLICATION**



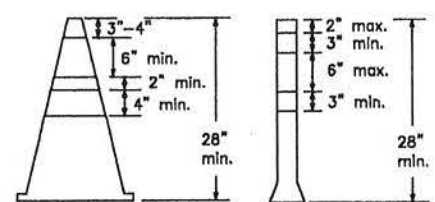
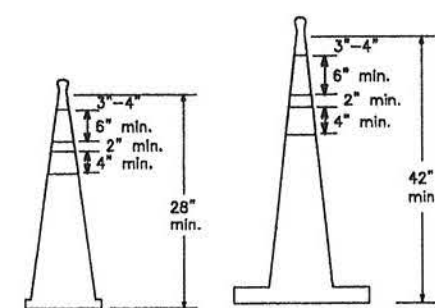
The three rails on Type III barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.

- Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type III Barricades.
- Advance signing shall be as specified elsewhere in the plans.



PLAN VIEW

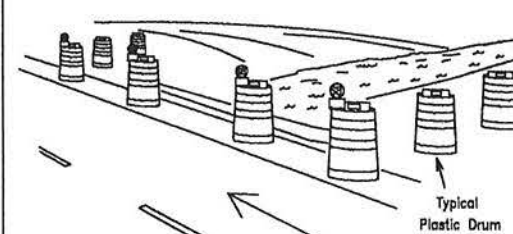
**CONES**



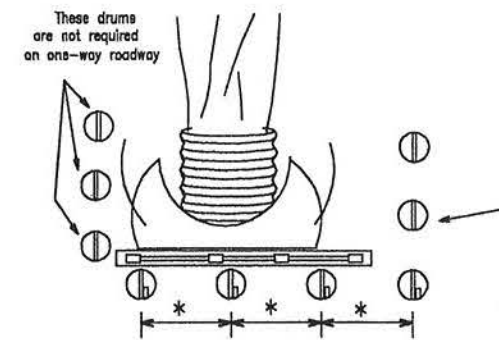
28" Cones shall have a minimum weight of 9 1/2 lbs.  
42" 2-piece cones shall have a minimum weight of 30 lbs.

- Traffic cones and tubular markers shall be a minimum of 28 inches in height when used either on freeways or at nighttime.
- Cones or tubular markers shall be predominantly orange, fluorescent red-orange, or fluorescent yellow-orange. They should be kept clean and bright for maximum visibility.
- Cones used only for daytime operations do not require the reflectorized bands.
- Cones used for nighttime operations shall be reflectorized. Reflectorized material shall have a smooth, sealed outer surface that displays the same approximate color during the day and night. The reflectorized bands shall be retroreflective Type C (High Specific Intensity) conforming to Departmental Material Specification DMS-8300, unless otherwise noted.
- When used at night, appropriate personnel shall ensure that cones and tubular markers remain in their proper location and in an upright position.
- Reflectorization of cones shall consist of a minimum 6 inch band placed at least 3 inches but not more than 4 inches from the top, supplemented by a minimum 4 inch band spaced a minimum of 2 inches below the 6 inch band.
- Reflectorization of tubular markers shall be a minimum of two 3 inch bands placed a maximum of 2 inches from the top with a maximum of 6 inches between bands. The reflectorized bands shall be retroreflective Type C (High Specific Intensity) conforming to Departmental Material Specification DMS-8300, unless otherwise noted.
- One-piece cones or tubular markers are generally suitable for temporary usage (up to 8 hours) with other channelization devices such as vertical panels, drums or two-piece cones for long term usage. Care should be taken to ensure they remain in their proper location and in an upright position.
- Cones or tubular markers used on each project shall be of the same size and shape.
- The handle may be designed as a hook or other shape, fabricated from non-rigid materials similar to the cone material, and may extend up to a maximum of 8 inches above the top of cone. Length of the handle shall not be considered with regard to the overall height of the cone.

**CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS**



PERSPECTIVE VIEW



PLAN VIEW

- Legend**
- (Symbol) Plastic drum
  - (Symbol) Plastic drum with steady burn light

- Where positive redirection capability is provided, drums may be omitted.
- Plastic construction fencing may be used with drums for safety as required in the plans.
- Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
- When the shoulder width is greater than 12 feet, steady-burn lights may be omitted if drums are used.
- Drums must extend the length of the culvert widening.

Only pre-qualified products shall be used. A copy of the "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be obtained by contacting:

Standards Engineer  
Traffic Operations Division - TE  
Texas Department of Transportation  
125 East 11th Street  
Austin, Texas 78701-2483  
Phone (512) 416-3120  
Fax (512) 416-3299

Instructions to locate the "CWZTCD" on TxDOT website are:

Start at website - [www.dot.state.tx.us](http://www.dot.state.tx.us)  
Click on "About TxDOT",  
Click on "Functional Organizational Chart",  
Click on "Traffic Operations Box",  
Click on "Compliant Work Zone Traffic Control Devices",  
again click on "Compliant Work Zone Traffic Control Devices".  
This site is printable.

CONSULTANT'S SHEET NO.



APPROVED: \_\_\_\_\_  
DATE: \_\_\_\_\_  
CITY TRAFFIC ENGINEER

DESIGN: C.A.R.	HORIZ. SCALE: NOTED
DRAWN: B.D.R. / A.D.	VERT. SCALE: NOTED
CHECK: D.V.S.	REVISION NO.

**CITY of CORPUS CHRISTI TEXAS**  
Department of Engineering Services  
Traffic Engineering Division

RINCON CHANNEL DRAINAGE  
DITCHES MAINTENANCE  
**BARRICADE AND CONSTRUCTION TYPE III BARRICADE & CONES STANDARD**

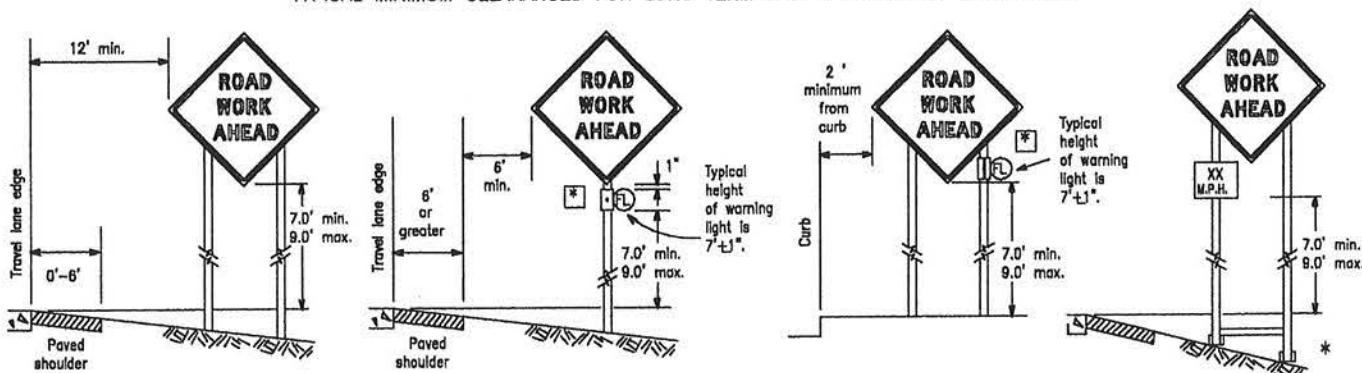
SHEET T03 of T05  
RECORD DRAWING NO.

CITY PROJECT # 2191

SMALL CONSTRUCTION CONTRACT SAMPLE CONTRACT PACKAGE Page 21 of 55  
New Document: Dec. 2004

BC(05)

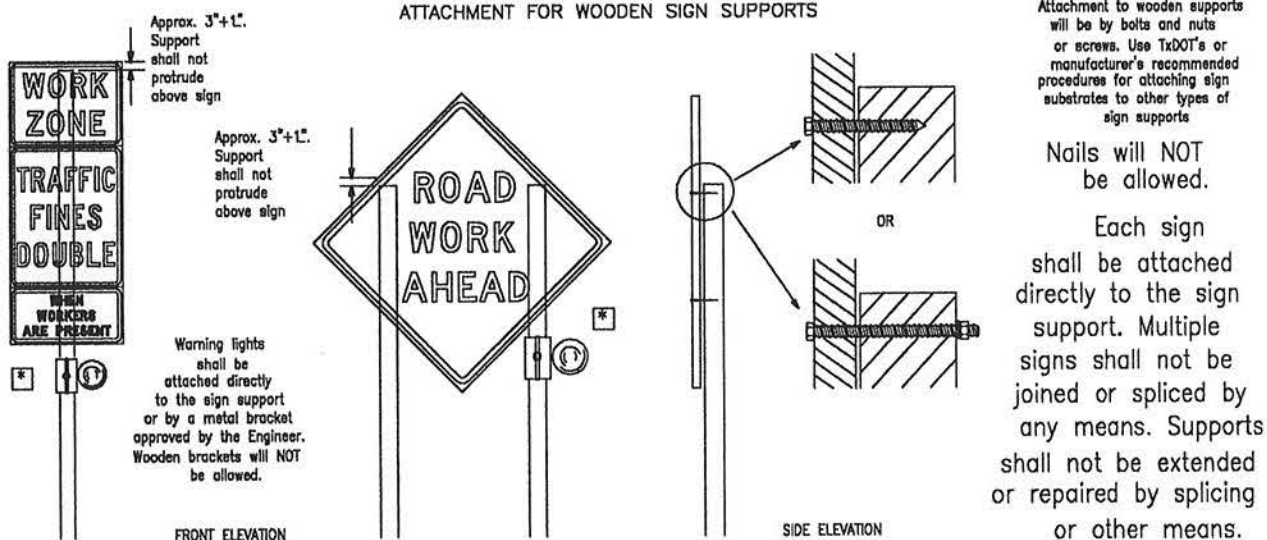
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



It is the intent of these plans to provide positive guidance to motorists throughout the project limits by the use of signs, pavement markings, delineation and/or channelizing devices. All traffic control devices shall conform with the "Texas Manual on Uniform Traffic Control Devices for Streets and Highways" (TMUTCD) and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).

\* When placing skid supports on uneven ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

ATTACHMENT FOR WOODEN SIGN SUPPORTS



Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports.

Nails will NOT be allowed. Each sign shall be attached directly to the sign support. Multiple signs shall not be joined or spliced by any means. Supports shall not be extended or repaired by splicing or other means.

GENERAL NOTES FOR WORK ZONE SIGNS

- Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
- Wooden sign posts shall be painted white.
- Barricades shall NOT be used as sign supports.
- Nails shall NOT be used to attach signs to any support.
- All signs shall be installed in accordance with the plans or as directed by the Engineer. Signs shall be used to regulate, warn, and guide the traveling public safely through the work zone.
- The Contractor may furnish either the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD). The Engineer/Inspector may require the Contractor to furnish other work zone signs that are shown in the TMUTCD but may have been omitted from the plans. Any variation in the plans shall be documented by written agreement between the Engineer and the Contractor's Responsible Person. All changes must be documented in writing before being implemented. This can include documenting the changes in the Inspector's daily report and having both the Inspector and Contractor initial and date the agreed upon changes. The additional signs requested by the Engineer/Inspector shall not be subsidiary.
- The Contractor shall furnish sign supports listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD). The Contractor shall install the sign support in accordance with the manufacturer's recommendations. If there is a question regarding installation procedures, the Contractor shall furnish the Engineer a copy of the manufacturer's installation recommendations so that the Engineer can verify the correct procedures are being followed.
- The contractor is responsible for sign installations and replacing signs with damaged or cracked substrates and/or damaged or marred reflective sheeting as directed by the Engineer/Inspector.
- Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used for identification shall be 1".
- The Contractor shall replace damaged wood posts. New or damaged wood sign posts shall not be spliced.
- Duration of Work (as defined by the "Texas Manual on Uniform Traffic Control Devices" Part V)
  - The types of sign supports, the size of signs, and the type of sign substrates can vary based on the type of work being performed. The Engineer is responsible for selecting the appropriate size sign for the type of work being performed. The Contractor is responsible for ensuring that the sign support and substrate meets crashworthiness and length of work requirements.
    - Long-term stationary - work that occupies a location more than 3 days.
    - Intermediate-term stationary - work that occupies a location from overnight to 3 days.
    - Short-term stationary - daytime work that occupies a location from 1 to 12 hours.
    - Short, duration - work that occupies a location up to 1 hour.
    - Mobile - work that moves intermittently or continuously. Does not stop for more than 15 minutes at a time.

SIGN MOUNTING HEIGHT

- The bottom of Long-term/Intermediate-term signs shall be at least 7 feet, but not more than 9 feet, above the paved surface.
- The bottom of Short-term/Short Duration signs shall be a minimum of 1 foot above the pavement surface but no more than 2 feet above the ground.
- Long-term/Intermediate-term Signs may be used in lieu of Short-term/Short Duration signing.
- Short-term/Short Duration signs shall be used only during daylight and shall be removed at the end of the workday.
- Regulatory signs shall be mounted at least 7 feet, but not more than 9.0 feet, above the paved surface regardless of work duration.

SIZE OF SIGNS

- The Engineer may allow the use of smaller size construction warning signs on secondary roads or city streets where speeds are low if the sign size is listed as an option on the "Typical Construction Warning Sign Size and Spacing" chart shown on BC(2).
- The Contractor shall furnish the sign sizes shown in plans, the BC Sheets, the TCP sheets or as directed by the Engineer.

SIGN SUBSTRATES

- The Contractor shall ensure that the sign substrate is allowed for the type of sign support that is being used. The CWZTCD lists each substrate that can be used on the different types and models of sign supports.
- "Mesh" type materials are NOT an approved sign substrate.

REFLECTIVE SHEETING

- ReflectORIZED signs shall be constructed of sheeting meeting the color and retro-reflectivity requirements of DMS-8300 or DMS-8310. The DMS specifications can be accessed from the following web address:  
<http://manuals.dot.state.tx.us/80/dynaweb/colmates/dms/GenericBookView>
- White sheeting, meeting the requirements of DMS-8300 Type C (High Specific Intensity), shall be used for signs with white background and channelizing devices.
- Orange sheeting, meeting the requirements of DMS-8300 Type E (Fluorescent PrismaLite), shall be used for signs with orange backgrounds.

SIGN LETTERS

- All sign letters and numbers shall be clear, and open rounded type uppercase alphabet letters as approved by the Federal Highway Administration (FHWA) and as published in the "Standard Highway Sign Design for Texas" manual. Signs, letters and numbers shall be of first class workmanship in accordance with Department Standards and Specifications.

REMOVING OR COVERING

- When sign messages may be confusing or do not apply, the signs shall be removed or completely covered.
- Long-term stationary or Intermediate stationary signs installed on square metal tubing may be turned away from traffic 90 degrees when the sign message is not applicable. This type of sign support meets the crashworthiness standards regardless of the direction of impact. This technique may not be used for signs installed in the median of divided highways or near any intersections where the sign may be seen from approaching traffic.
- Signs installed on skids shall not be turned at 90 degree angles to the roadway. These signs should be removed or completely covered when not required.
- When signs are covered, the material used shall be opaque, such as heavy mil black plastic.
- Burlap shall NOT be used to cover signs.
- Duct tape or other adhesive material shall NOT be affixed to a sign face. These materials can damage the retroreflectivity of sign sheeting.
- Signs shall be removed upon completion of the work.

SIGN SUPPORT WEIGHTS

- Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand is recommended.
- The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
- Rock, concrete, iron, steel or other solid objects will not be permitted for use as sign support weights.
- Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs.
- Sandbags shall be made of a durable material that tears upon vehicular impact.
- Rubber (such as tire inner tubes) shall NOT be used for sandbags.
- Rubber ballasts (such as those used with cones or edgeline channellizers) shall NOT be used as sign support weights.
- Sandbags shall only be placed along or laid over the base supports of the traffic control device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners. Sandbags shall be placed along the length of the skids to weigh down the sign support.
- Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

Only pre-qualified products shall be used. A copy of the "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be obtained by contacting:

Standards Engineer  
Traffic Operations Division - TE  
Texas Department of Transportation  
125 East 11th Street  
Austin, Texas 78701-2483  
Phone (512) 416-3120  
Fax (512) 416-3289

Instructions to locate the "CWZTCD" on TxDOT website are:

Start at website - [www.dot.state.tx.us](http://www.dot.state.tx.us)  
Click on "About TxDOT",  
Click on "Functional Organizational Chart",  
Click on Traffic Operations Box,  
Click on "Compliant Work Zone Traffic Control Devices",  
again click on "Compliant Work Zone Traffic Control Devices".  
This site is printable.

Ⓢ Flashing Type A - Low Intensity Warning Light

\* The Type A Warning lights shall not be used with Type E Sheeting (Fluorescent Prismatic) meeting the requirements of DMS-8300.

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

- Permanent signs are used to give notice of traffic laws or regulations, call attention to conditions that are potentially hazardous to traffic operations, show route designations, destinations, directions, distances, services, points of interest, and other geographical, recreational, or cultural information. Drivers proceeding through a work zone need the same, if not better route guidance as normally installed on a roadway without construction.
- When permanent regulatory or warning signs conflict with work zone conditions, remove or cover the permanent signs until the permanent sign message matches the roadway condition.
- When existing permanent signs are moved and relocated due to construction purposes, they shall be visible to motorists at all times.
- If existing signs are to be relocated on their original supports, they shall be installed on crashworthy bases as shown on the SMD Standard sheets. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards. This work should be paid for under the appropriate pay item for relocating existing signs.
- If permanent signs are to be removed and relocated using temporary supports, the Contractor shall use crashworthy supports as shown on the BC Sheets or the CWZTCD. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards during construction. This work should be paid for under the appropriate pay item for relocating existing signs.
- Any sign or traffic control device that is struck or damaged by the Contractor or his/her construction equipment shall be replaced as soon as possible by the Contractor to ensure proper guidance for the motorists.



APPROVED:	DATE:	DESIGN: C.A.R.	HORIZ. SCALE: NOTED
CITY TRAFFIC ENGINEER		DRAWING: B.L.R. / A.D.	VERT. SCALE: NOTED
		CHECK: D.V.S.	BY
		REVISION NO.	DATE

CITY of CORPUS CHRISTI  
TEXAS  
Department of Engineering Services  
Traffic Engineering Division

RINCON CHANNEL DRAINAGE  
DITCHES MAINTENANCE  
BARRICADE AND CONSTRUCTION  
TEMPORARY SIGN NOTES STANDARD

SHEET T04 of T05  
RECORD DRAWING NO.

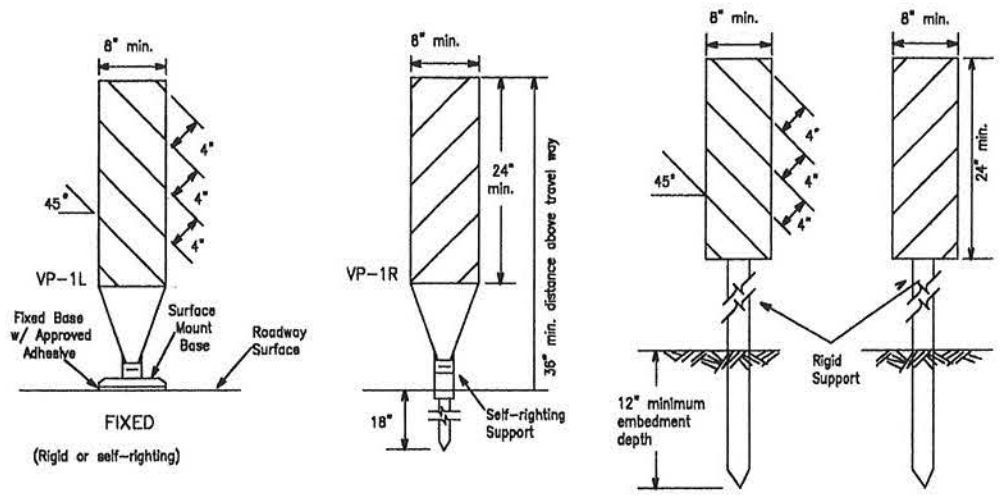
CITY PROJECT # 2191

SMALL CONSTRUCTION CONTRACT  
SAMPLE CONTRACT PACKAGE  
Page 22 of 55  
New Document: Dec. 2004

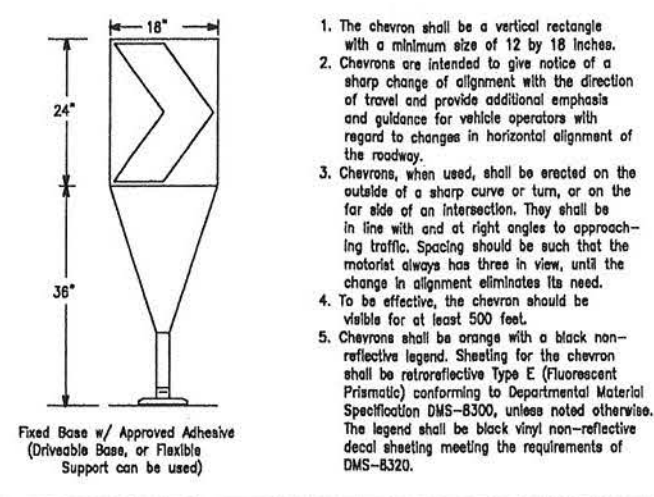


CHANNELIZING DEVICES

VERTICAL PANELS



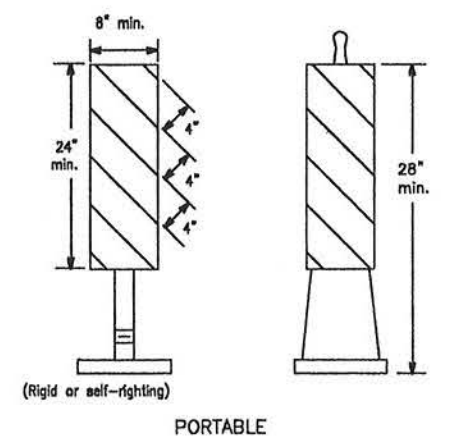
CHEVRONS



GENERAL NOTES:

1. Work Zone channelizing devices illustrated on this sheet may be installed in close proximity to traffic and are suitable for use on high or low speed roadways. The Engineer/Inspector shall ensure that spacing and placement is uniform and in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
2. Channelizing devices shown on this sheet may have a driveable, fixed or portable base. The requirement for self-righting channelizing devices must be specified in the General Notes or other plan sheets.
3. Channelizing devices on self-righting supports should be used in work zone areas where channelizing devices are frequently impacted by errant vehicles or vehicle related wind gusts making alignment of the channelizing devices difficult to maintain. Locations of these devices shall be detailed elsewhere in the plans. These devices shall conform to the TMUTCD and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
4. The contractor shall maintain devices in a clean condition and replace damaged, non-reflective, faded, or broken devices and bases as required by the Engineer/Inspector. The Contractor shall be required to maintain proper device spacing and alignment.
5. Portable bases shall be fabricated from virgin and/or recycled rubber. The portable bases shall weigh approximately 35 lbs.
6. Pavement surfaces shall be prepared in a manner that ensures proper bonding between the adhesives, the fixed mount bases and the pavement surface. Adhesives shall be prepared and applied according to the manufacturer's recommendations.
7. The installation and removal of channelizing devices shall not cause detrimental effects to the final pavement surfaces, including pavement surface discoloration or surface integrity. Driveable bases shall not be permitted on final pavement surfaces. The Engineer/Inspector shall approve all application and removal procedures of fixed bases.
8. Examples on this sheet are the most commonly used channelizing devices in work zones. For other devices, refer to the CWZTCD.

DRIVEABLE



1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is required. The Engineer/Inspector shall refer to the Roadway Design Manual Appendix B "Treatment of Pavement Drop-offs in Work Zones" for additional guidelines on the use of VP's for drop-offs.
3. VP's should be mounted back to back if used at the edge of cuts adjacent to two-way two lane roadways. Stripes are to be reflective orange and reflective white and should always slope downward toward the travel lane.
4. VP's used on expressways, freeways, and on high speed roadways shall have a minimum of 2 square feet of retroreflective area facing traffic.
5. Self-righting supports are available with portable base. See "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
6. Sheeting for the VP's shall be retroreflective Type C (High Specific Intensity) conforming to Departmental Material Specification DMS-8300, unless noted otherwise.

Posted Speed	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices	
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'-75'
35		205'	225'	245'	35'	70'-90'
40		265'	295'	320'	40'	80'-100'
45	L=WS	450'	495'	540'	45'	90'-110'
50		500'	550'	600'	50'	100'-125'
55		550'	605'	660'	55'	110'-140'
60		600'	660'	720'	60'	120'-150'
65		650'	715'	780'	65'	130'-165'
70		700'	770'	840'	70'	140'-175'
75		750'	825'	900'	75'	150'-185'

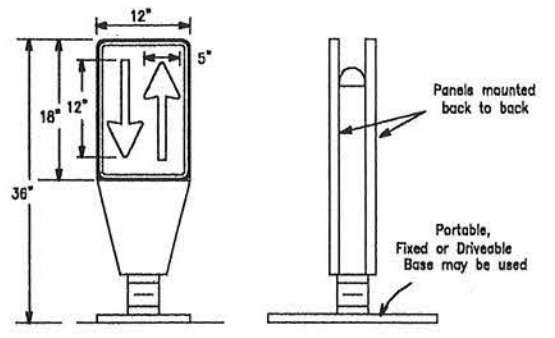
\*\* Taper lengths have been rounded off.  
L=Length of Taper (FT.) W=Width of Offset (FT.) S=Posted Speed (MPH)

Only pre-qualified products shall be used. A copy of the "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be obtained by contacting:

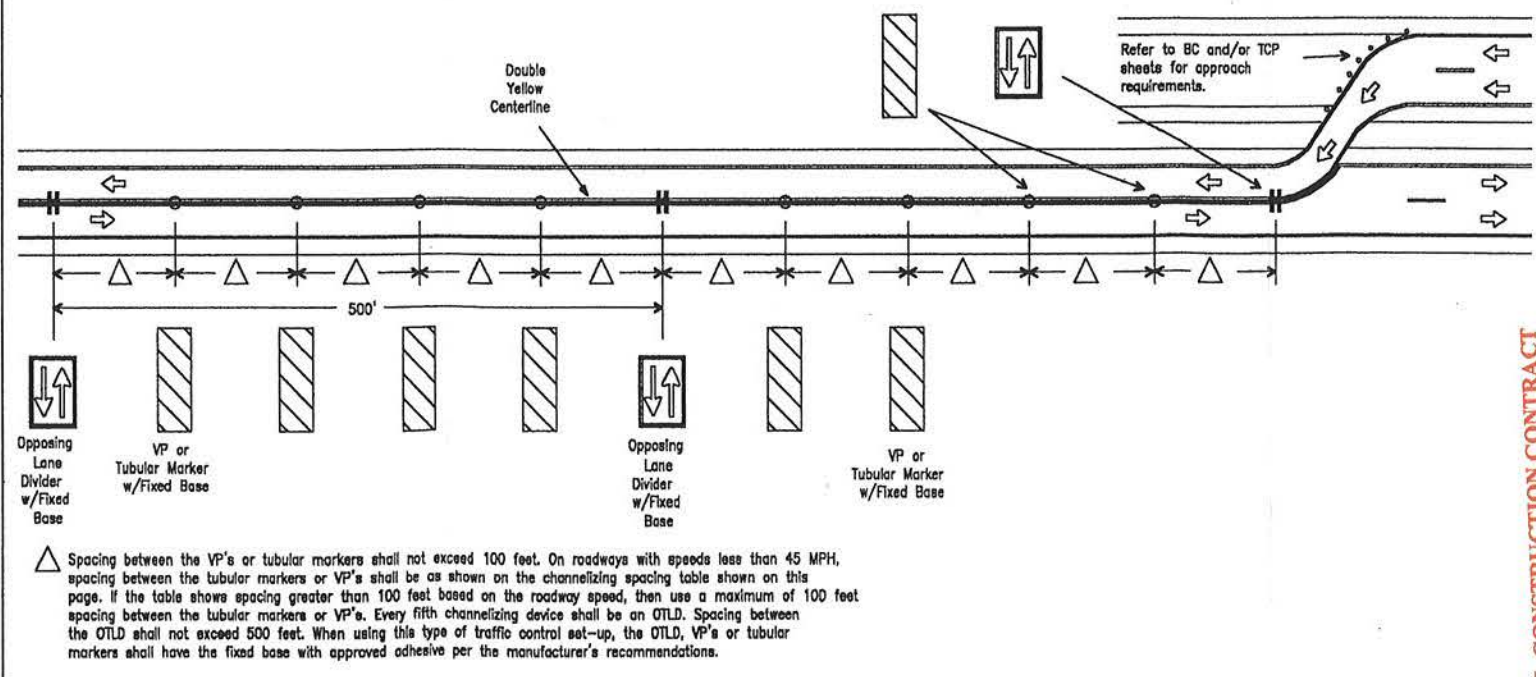
Standards Engineer  
Traffic Operations Division - TE  
Texas Department of Transportation  
125 East 11th Street  
Austin, Texas 78701-2483  
Phone (512) 416-3120  
Fax (512) 416-3298

Instructions to locate the "CWZTCD" on TxDOT website are:  
Start at website - www.dot.state.tx.us  
Click on "About TxDOT",  
Click on "Functional Organizational Chart",  
Click on Traffic Operations Box,  
Click on "Compliant Work Zone Traffic Control Devices",  
again click on "Compliant Work Zone Traffic Control Devices".  
This site is printable.

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



1. Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The base is secured to the pavement with an adhesive or rubber weight to minimize movement caused by a vehicle impact or wind gust. The OTLD is placed on a flexible self-righting support that returns to an up-right position when impacted by a vehicle.
2. The OTLD may be used in combination with simple tubular markers or vertical panels (vp's).
3. Spacing between the OTLD shall not exceed 500 feet. Tubular markers or vp's placed between the OTLD's should not exceed 100 foot spacing.
4. The OTLD shall be orange with a black non-reflective legend. Sheeting for the OTLD shall be retroreflective Type E (Fluorescent Prismatic) conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall be black vinyl non-reflective decal sheeting meeting the requirements of DMS-8320.



△ Spacing between the VP's or tubular markers shall not exceed 100 feet. On roadways with speeds less than 45 MPH, spacing between the tubular markers or VP's shall be as shown on the channelizing spacing table shown on this page. If the table shows spacing greater than 100 feet based on the roadway speed, then use a maximum of 100 feet spacing between the tubular markers or VP's. Every fifth channelizing device shall be an OTLD. Spacing between the OTLD shall not exceed 500 feet. When using this type of traffic control set-up, the OTLD, VP's or tubular markers shall have the fixed base with approved adhesive per the manufacturer's recommendations.

SMALL CONSTRUCTION CONTRACT  
SAMPLE CONTRACT PACKAGE  
Page 23 of 55  
New Document: Dec. 2004

CITY of CORPUS CHRISTI  
TEXAS  
Department of Engineering Services  
Traffic Engineering Division

RINCON CHANNEL DRAINAGE  
DITCHES MAINTENANCE  
BARRICADE AND CONSTRUCTION  
CHANNELIZING DEVICES STANDARD

SHEET T05 of T05  
RECORD DRAWING NO.

CITY PROJECT # 2191

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BC(08,

**ATTACHMENT NO. 4**

**CORPS OF ENGINEERS**

**PERMIT**



REPLY TO  
ATTENTION OF:

**DEPARTMENT OF THE ARMY**  
**GALVESTON DISTRICT, CORPS OF ENGINEERS**  
Corpus Christi Regulatory Field Office  
5151 Flynn Parkway, Suite 306  
Corpus Christi, Texas 78411-4318

March 10, 2003

Regulatory Section

SUBJECT: Permit D-14185

City of Corpus Christi  
Angel Escobar P.E.  
PO Box 9277  
Corpus Christi, TX 78469

Dear Mr. Escobar:

You may proceed with the maintenance of the existing drainage ditch connections (ditches E, F, G, and H) as proposed by your agent, Shiner Mosely and Associates, Inc in their August 9, 2002, letter. The connections are between existing 24-inch concrete pipe culverts along the west side of US Highway 181 and Rincon Canal "A". The maintenance activity shall comply with the project plans and the enclosed Nationwide Permit (NWP) general/regional conditions. Also, please be aware of the enclosed Texas Commission on Environmental Quality's best management practice guidelines for NWP No. 3. The project site is located between US Highway 181 and Rincon Canal A, between Surfboard and Beach Streets in Corpus Christi, Nueces County, TX.

Nationwide Permit 3 authorizes the repair of a previously authorized structure provided the structure is not put to a different use than that for which it was originally constructed. Minor deviations due to changes in construction techniques, materials or the like are authorized.

A copy of your plans in 4 sheets is enclosed. This authorization is based on a preliminary jurisdictional determination and remains valid for two years from the date of this letter. The following special condition(s) has been added to your authorization:

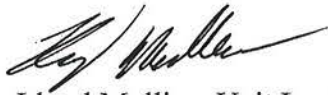
1. The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States because of any such removal or alteration.

**SMALL CONSTRUCTION CONTRACT  
SAMPLE CONTRACT PACKAGE**  
Page 25 of 55  
New Document: Dec. 2004

2. The permittee shall not remove, harm, or otherwise interfere with the mangrove tree located between Culvert "F" and Rincon Canal.

Please notify the US Army Corps of Engineers know when you complete your project by returning the enclosed pre-addressed postcard. If you have any questions concerning this matter, please contact Reagan Richter at the letterhead address or by telephone at 361-814-5847 Ext 29.

Sincerely,



Lloyd Mullins, Unit Leader  
Corpus Christi Regulatory Office

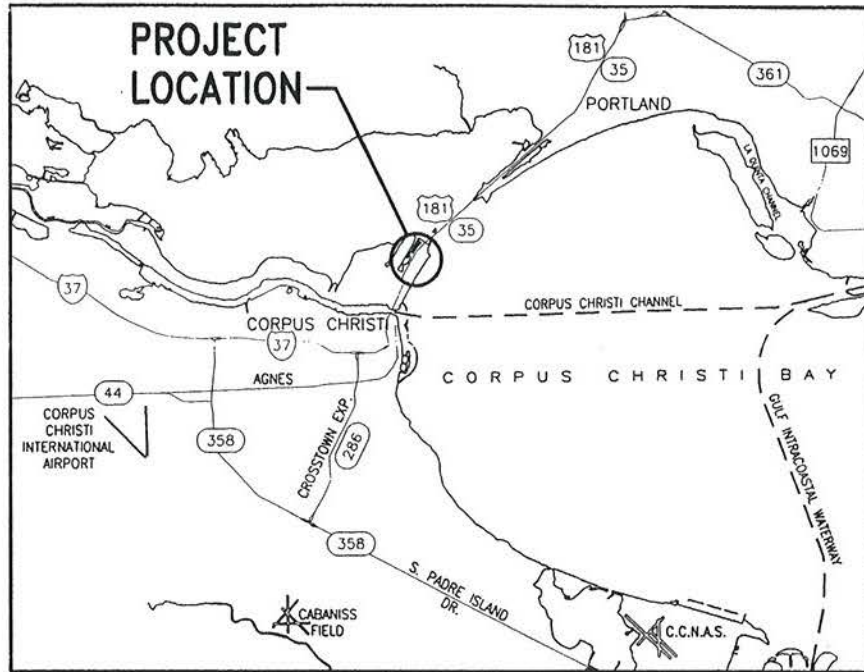
Enclosures  
General/Regional Conditions  
Best Management Practice Guidelines

Copy Furnished:  
Lynnda Khann  
Shiner Mosely and Associates, Inc.

**SMALL CONSTRUCTION CONTRACT  
SAMPLE CONTRACT PACKAGE**

Page 26 of 55

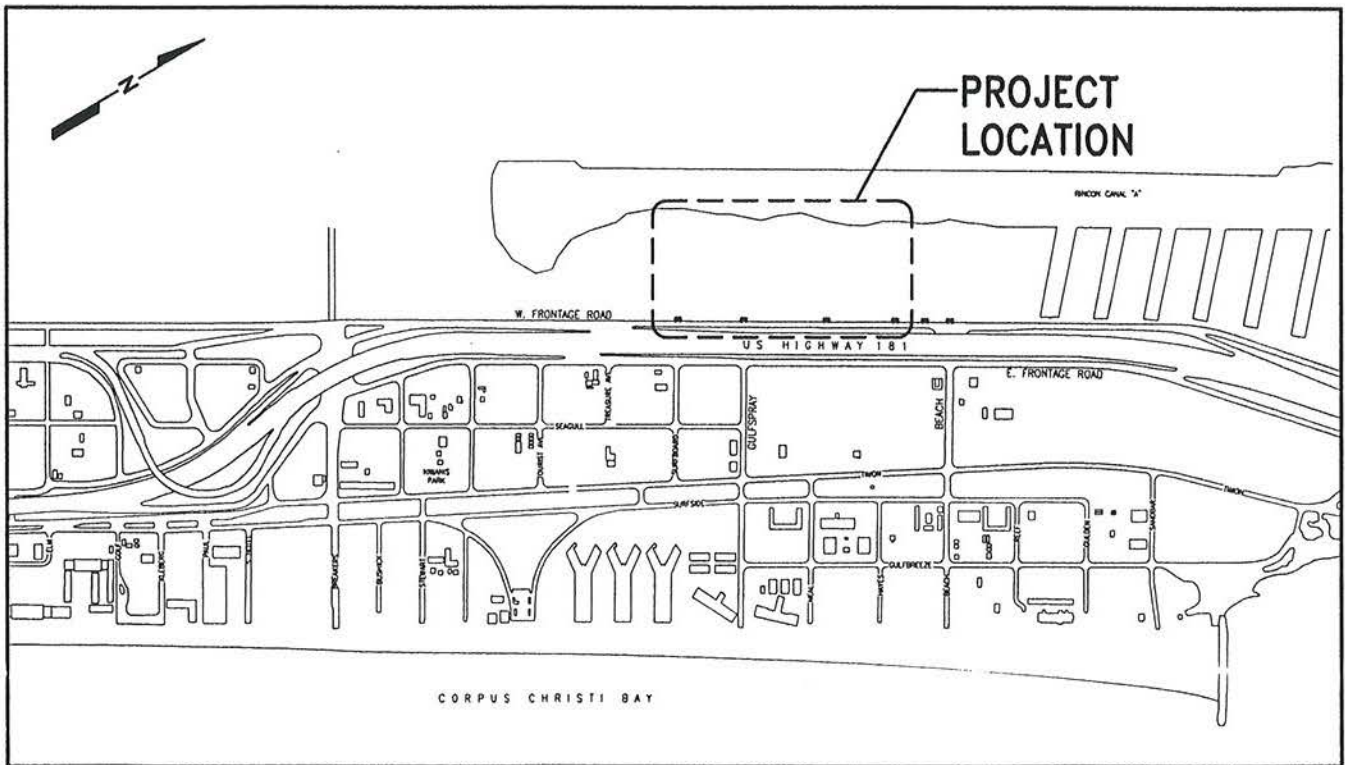
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D-14185  
P. 1 of 4

### VICINITY MAP

PERMITTED PLANS



### LOCATION MAP

0 1000'

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SAMPLE CONTRACT PACKAGE**

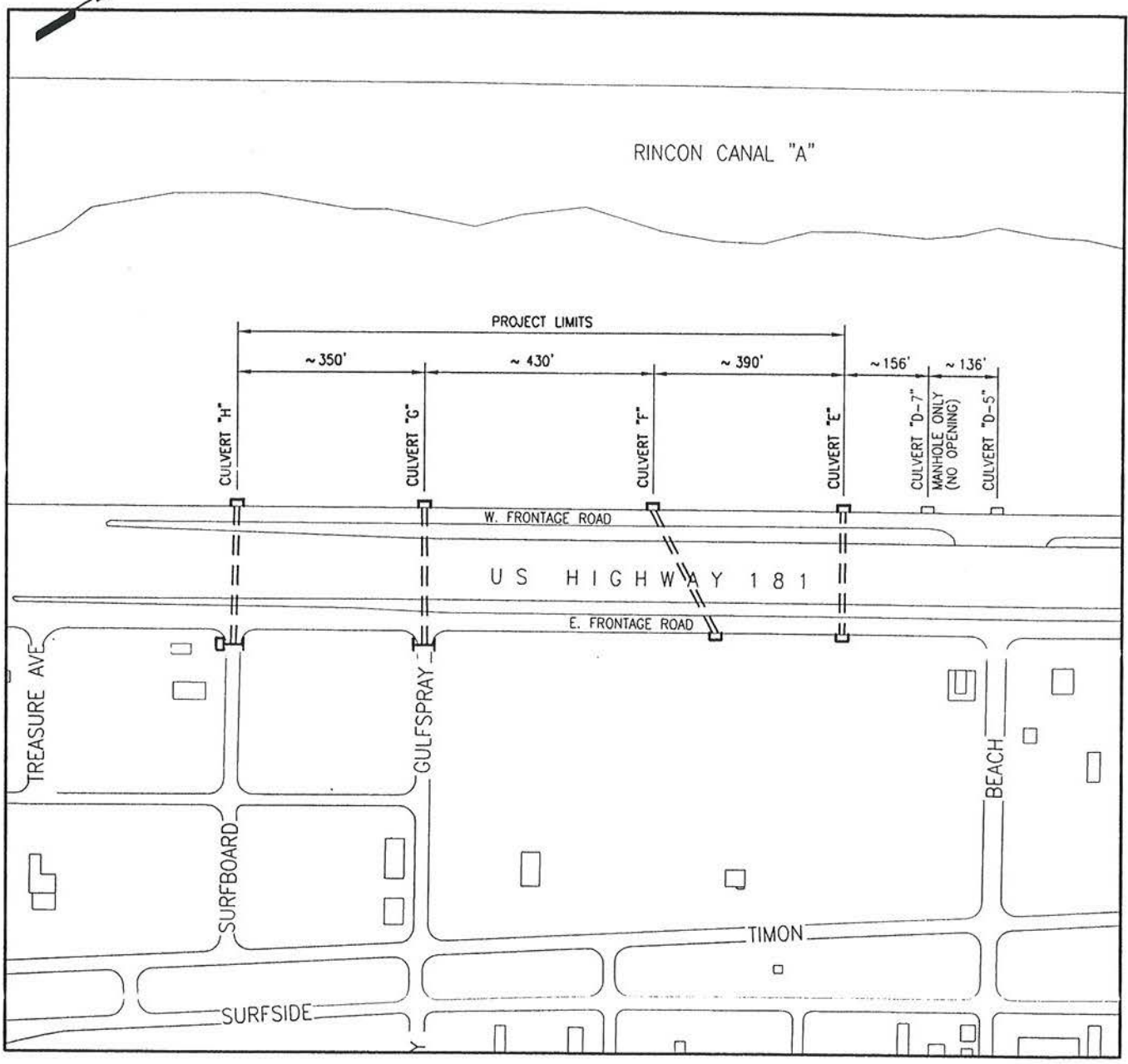
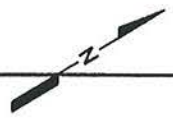
Page 27 of 55

New Document: Dec. 2004

ACTIVITY: RINCON CHANNEL MAINTENANCE OF EXISTING DRAINAGE DITCHES

APPLICANT: CITY OF CORPUS CHRISTI - PROJECT #8446

DATE: 08/08/02



D-14185  
p. 2 of 4

1 SITE PLAN  
1 2 SCALE: 1" = ~300'

PERMITTED PLANS

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ACTIVITY: RINCON CHANNEL MAINTENANCE OF EXISTING DRAINAGE DITCHES

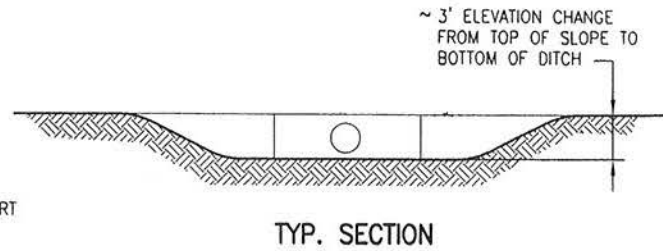
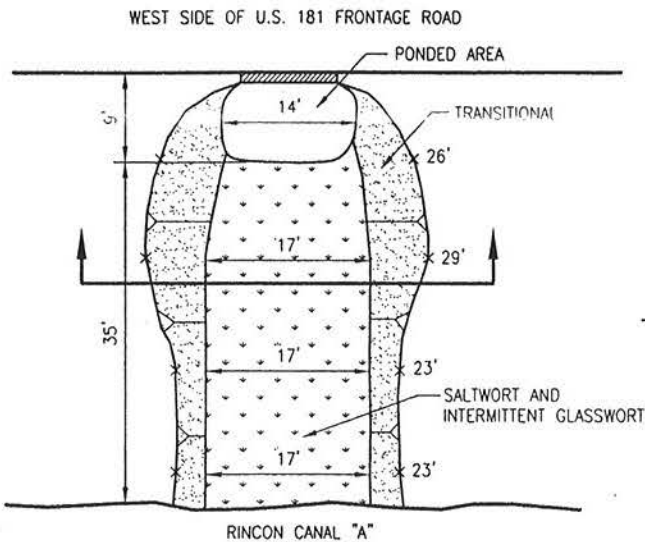
APPLICANT: CITY OF CORPUS CHRISTI - PROJECT #8446

DATE: 08/08/02

**SMALL CONSTRUCTION CONTRACT  
SAMPLE CONTRACT PACKAGE**  
Page 28 of 55  
New Document: Dec. 2004

SMA Job No: 200.20203 SHEET 2 of 4

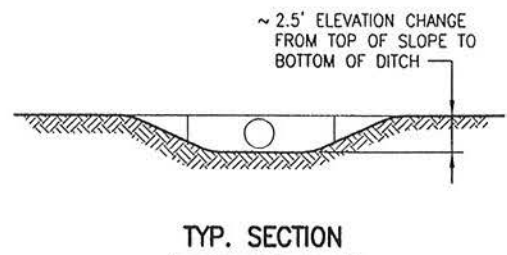
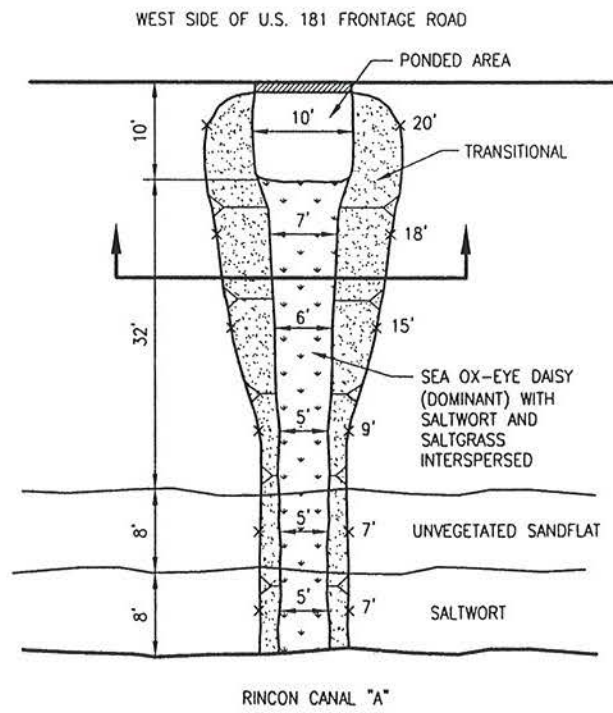




**1 PLAN - CULVERT "E"**  
SCALE: 1" = 20'

Culvert "E" will require the removal of approximately 26 CY of material.  
(8' x 2' x 44' = 704 ft<sup>3</sup> = 26 CY)

All culverts (E, F, G, and H) will be excavated to a width no greater than 8 feet wide and 2 feet deep between the westernmost culvert opening and Rincon Canal.



**2 PLAN - CULVERT "F"**  
SCALE: 1" = 20'

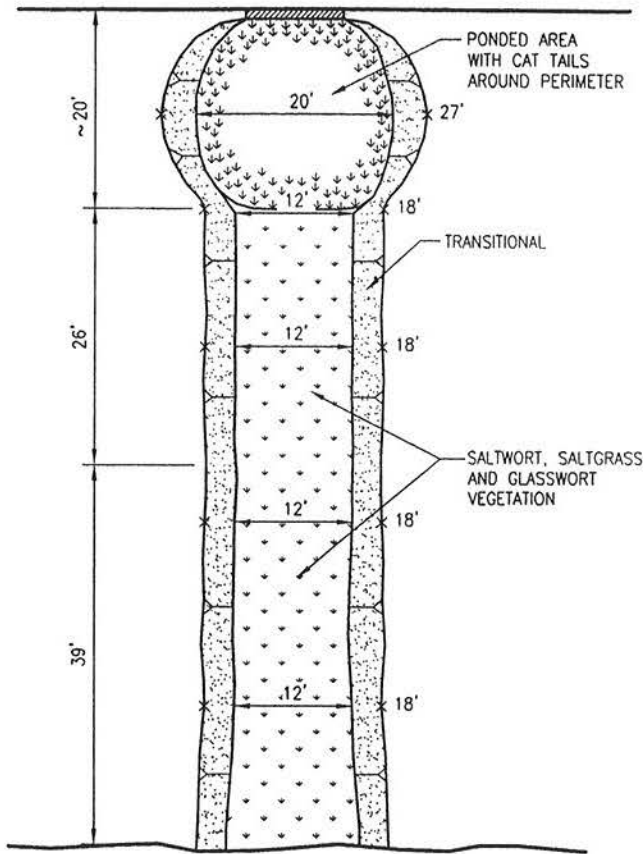
Culvert "F" will require the removal of approximately 35 CY of material.  
(8' x 2' x 58' = 928 ft<sup>3</sup> = 35 CY)

**TYP. SECTION**  
D-14185  
P. 3 of 4  
**PERMITTED PLANS**

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ACTIVITY: RINCON CHANNEL MAINTENANCE OF EXISTING DRAINAGE DITCHES
APPLICANT: CITY OF CORPUS CHRISTI - PROJECT #8446
DATE: 08/08/02

WEST SIDE OF U.S. 181 FRONTAGE ROAD

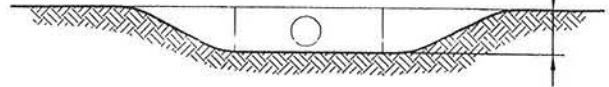


RINCON CANAL "A"

**1 PLAN - CULVERT "G"**  
SCALE: 1" = 20'

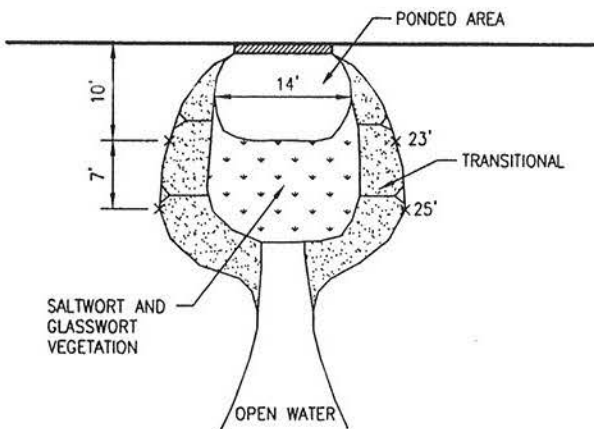
Culvert "G" will require the removal of approximately 78 CY of material.  
(8' x 2' x 131' = 2096 ft<sup>3</sup> = 78 CY)

~2' CHANGE IN ELEVATION INITIALLY BETWEEN TOP OF SLOPE TO BOTTOM OF DITCH THEN DECREASES TO ~.5' IN NARROWER PORTION OF DITCH



All culverts (A, B, C, and D) will be excavated to a width no greater than 8 feet wide and 2 feet deep between the westernmost culvert opening and Rincon Canal.

WEST SIDE OF U.S. 181 FRONTAGE ROAD

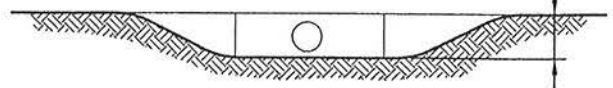


**2 PLAN - CULVERT "H"**  
SCALE: 1" = 20'

PERMITTED PLANS

D-14185  
p. 4 of 4

~.7' TO 1' ELEVATION CHANGE BETWEEN TOP OF SLOPE TO BOTTOM OF DITCH



Culvert "H" will require the removal of approximately 25 CY of material.  
(8' x 2' x 1

**SMALL CONSTRUCTION CONTRACT  
SAMPLE CONTRACT PACKAGE**  
Page 30 of 55  
New Document: Dec. 2004

ACTIVITY: RINCON CHANNEL MAINTENANCE OF EXISTING DRAINAGE DITCHES

APPLICANT: CITY OF CORPUS CHRISTI - PROJECT #8446

DATE: 08/08/02

SMA Job No: 200.20203 SHEET 4 of 4

**Nationwide Permit General Conditions:**

The following general conditions must be followed in order for any authorization by an NWP to be valid:

1. Navigation. No activity may cause more than a minimal adverse effect on navigation.
2. Proper Maintenance. Any structure or fill authorized shall be properly maintained, including maintenance to ensure public safety.
3. Soil Erosion and Sediment Controls. Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow.
4. Aquatic Life Movements. No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species which normally migrate through the area, unless the activity's primary purpose is to impound water. Culverts placed in streams must be installed to maintain low flow conditions.
5. Equipment. Heavy equipment working in wetlands must be placed on mats, or other measures must be taken to minimize soil disturbance.
6. Regional and Case-By-Case Conditions. The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) Additionally, any case specific conditions added by the Corps or by the State or tribe in its Section 401 water Quality Certification and Coastal Zone Management Act consistency determination.
7. Wild and Scenic Rivers. No activity may occur in a component of the National Wild and Scenic River System; or in a river officially designated by Congress as a "study river" for possible inclusion in the system, while the river is in an official study status; unless the appropriate Federal agency, with direct management responsibility for such river, has determined writing that the proposed activity will not adversely affect the Wild and Scenic River designation, or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency in the area (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service).
8. Tribal Rights. No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.
9. Water Quality. (a) In certain States and tribal lands an individual 401 water quality certification must be obtained or waived (See 33 CFR 330.4(c)). (b) For NWPs 12, 14, 17, 18, 32, 39, 40, 42, 43, and 44, where the State or tribal 401 certification (either generically or individually) does not require or approve a water quality management measures, the permittee must provide water quality management measures that will ensure that the authorized work does not result in more than minimal degradation of water quality (or the Corps determines that compliance with state or local standards, where applicable, will ensure no more than minimal adverse effect on water quality). An important component of water quality management includes stormwater management that minimizes degradation of the downstream aquatic system, including water quality (refer to General Condition 21 for stormwater management requirements). Another important component of water quality management is the establishment and maintenance of vegetated buffers next to open waters, including streams (refer to General Condition 19 for vegetated buffer requirements for the NWPs). This condition is only applicable to projects that have the potential to affect water quality. While appropriate measures must be taken, in most cases it is not necessary to conduct detailed studies to identify such measures or to require monitoring.
10. Coastal Zone Management. In certain states, an individual state coastal zone management consistency concurrence must be obtained or waived (see Section 330.4(d)).
11. Endangered Species. (a) No activity is authorized under any NWP, which is likely to jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will destroy or adversely modify the critical habitat of such species. Non-federal permittees shall notify the District Engineer if any listed species or designated critical habitat might be affected is in the vicinity of the project, or is located in the designated critical habitat and shall not begin work on the activity until notified by the District Engineer that the requirements of the Endangered Species Act have been satisfied, and that the

- (a) The project must be designed and constructed to avoid and minimize adverse effects to waters of the US to the maximum extent practicable at the project site (i.e., on site).
- (b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing or compensating) will be required to the extent necessary to ensure that the adverse effects to the aquatic environment are minimal.
- (c) Compensatory mitigation at a minimum one for one ratio will be required for all wetland impacts requiring a PCN, unless the district Engineer determines in writing that some other form of mitigation would be more environmentally appropriate and provides a project specific waiver of this requirement. Consistent with National policy, the District Engineer will establish a preference for restoration of wetlands as compensatory mitigation, with preservation used only in exceptional circumstances.
- (d) Compensatory mitigation (i.e., replacement or substitution of aquatic resources or those impacted) will not be used to increase the acreage losses allowed by the acreage limits of some of the NWPs. For example ¼ -acre of wetlands cannot be created to charge a ¼ -acre loss of wetlands to a ½-acre loss associated with NWP 39 verification. However, ½-acre loss of wetlands can be used to reduce the impacts of ½ acre loss of wetlands to the minimum impact level in order to meet the minimal impact requirement associated with NWPs
- (e) To be practicable, the mitigation must be available and capable of being done considering cost, existing technology, and logistics in light of the overall project purposes. Examples of mitigation that may be appropriate and practicable include, but are not limited to: reducing the size of the project; establishing and maintaining wetland or upland vegetated buffers to protect open waters such as streams; and replacing losses of aquatic resource functions and values by creating, restoring, enhancing, or preserving similar functions and values, preferably in the same watershed.
- (f) Compensatory mitigation plans for projects in or near streams or other open waters will normally include a requirement for the establishment, maintenance, and legal protection (e.g., easements, deed restrictions) of vegetated buffers to open waters. In many cases vegetated buffers will be the only compensatory mitigation required. Vegetated buffers should consist of native species. The width of the vegetated buffers required will address documented water quality or aquatic habitat loss concerns. Normally, the vegetated buffer will be 25 to 50 feet wide on each side of the stream, but the District Engineers may require slightly wider vegetated buffers to address documented water quality or habitat loss concerns. Where both wetlands and open waters exist on the project site, the Corps will determine the appropriate compensatory mitigation (e.g., stream buffers or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where vegetated buffers are determined to be the most appropriate form of compensatory mitigation, the District Engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland impacts.
- (g) Compensatory mitigation proposals submitted with the "notification" may be either conceptual or detailed. If conceptual plans are approved under the verification, then the Corps will condition the verification to require detailed plans be submitted and approved by the corps prior to construction of the authorized activity in waters of the US.
- (h) Permittees may propose the use of mitigation banks, in-lieu fee arrangements or separate activity specific compensatory mitigation. In all cases that require compensatory mitigation, the mitigation provisions will specify the party responsible for accomplishing and/or complying with the mitigation plan.

20. Spawning Areas. Activities, including structures and work in navigable waters of the United States or discharges of dredged or fill material, in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., excavate, fill, or smother downstream by substantial turbidity) of an important spawning area are not authorized.

21. Management of Water Flows. To the maximum extent practicable, the activity must be designed to maintain preconstruction downstream flow conditions (e.g., location, capacity, and flow rates). Furthermore, the activity must not permanently restrict or impede the passage of normal or expected high flows (unless the primary purpose of the fill is to impound waters) and the structure or discharge of dredged or fill material must withstand expected high flows. The activity must, to the maximum extent practicable, provide for retaining excess flows from the site, provide for maintaining surface flow rates from the site similar to preconstruction conditions, and provide for not increasing water flows from the project site, relocating water, or redirecting water flow beyond preconstruction conditions. Stream channelizing will be reduced to the minimal amount necessary, and the activity must, to the maximum extent practicable, reduce adverse effects such as flooding or erosion downstream and upstream of the project site, unless the activity is part of a larger system designed to manage water flows. In most cases, it will not be a requirement to conduct detailed studies and monitoring of water flow. This condition is only applicable to projects that have the potential to affect water flows. While appropriate measures must be taken, it is not necessary to conduct detailed studies to identify such measures or require monitoring to ensure their effectiveness. Normally, the Corps will defer to state and local authorities regarding management of water flow.

**The following regional conditions apply only within the State of Texas.**

The following regional conditions apply throughout the State of Texas:

1. For all discharges proposed for authorization under nationwide permits (NWP) 3, 6, 7, 12, 14, 18, 19, 25, 27, 29, 39, 40, 41, 42, 43, and 44, into the following habitat types or specific areas, the applicant shall notify the appropriate District Engineer in accordance with the NWP General Condition 13. The Corps will coordinate with the resource agencies as specified in NWP General Condition 13(e). The habitat types or areas are:

a. Wetlands, typically referred to as pitcher plant bogs, that are characterized by an organic surface soil layer and include vegetation such as pitcher plants (Sarracenia sp.), sundews (Drosera sp.), and sphagnum moss (Sphagnum sp.).

b. Baldcypress-Tupelo Swamps: Wetlands comprised predominantly of baldcypress trees (Taxodium distichum), and water tupelo trees (Nyssa aquatica), that are occasionally or regularly flooded by fresh water. Common associates include red maple (Acer rubrum), swamp privet (Forestiera acuminata), green ash (Fraxinus pennsylvanica) and water elm (Planera aquatica). Associated herbaceous species include lizard's tail (Saururus cernuus), water mermaid weed (Proserpinaca spp.), buttonbush (Cephalanthus occidentalis) and smartweed (Polygonum spp.). (Eyre, F. H. Forest Cover Types of the United States and Canada. 1980. Society of American Foresters, 5400 Grosvenor Lane, Washington, D.C. 20014. Library of Congress Catalog Card No. 80-54185)

**The following regional conditions apply only within the Galveston District:**

5. NWP 12 shall not be used to authorize discharges within 500 feet of a seagrass bed or oyster reef.

6. For all 3-D seismic test discharges conducted within the coastal zone of Texas pursuant to NWP 6, the applicant shall notify the District Engineer in accordance with the NWP General Condition 13.

7. Nationwide permits 7, 12, 14, 18, 19, 25, 29, 39, 40, 41, 42, 43, and 44 shall not be used to authorize discharges into the following waters of the United States within the coastal zone of Texas:

a. Mangrove marshes: Wetlands within the Texas Gulf Coastal Plain that are occasionally or regularly flooded by brackish or saline water and have more than 40 percent cover by woody plants. The dominant woody species in this environment is the black mangrove (Avicennia germinans) with a dominant herbaceous species component of smooth cordgrass (Spartina alterniflora). (Preliminary Guide to Wetlands of the Gulf Coastal Plain. 1978. Technical Report - U.S. Army Engineer Waterways Experiment Station: Y-78-5. P.O. Box 631, Vicksburg, Miss. 39180.)

b. Coastal Dune Swales: "Wetlands and other waters of the United States that are formed as depressions within and among multiple beach ridge barriers, dune complexes, or dune areas adjacent to beaches fronting the tidal waters of the Gulf of Mexico and adjacent to the tidal waters of bays and estuaries. Coastal dune swales are generally comprised either of impermeable muds that act as reservoirs which collect precipitation or of groundwater nourished wetlands in sandy soils. As such, they generally have a high fresh to brackish water table. Vegetation species characteristically found in coastal dune swales include but are not limited to marshhay cordgrass (Spartina patens), gulfdune paspalum (Paspalum monostachyum), bulrush (Scirpus spp.), seashore paspalum (Paspalum vaginatum), common reed (Phragmites australis), groundsel bush (Baccharis halimifolia), rattlebush (Sesbania drummondii), camphor weed (Pluchea camphorata), smartweed (Polygonum spp.), water hyssop (Bacopa monnieri), cattail (Typha spp.), umbrella sedge (Cyperus spp.), softrush (Juncus spp.), sedge (Carex spp.), beakrush (Rhynchospora spp.), frog-fruit (Phyla spp.), duckweed (Lemna spp.), buttonweed (Diodia virginiana), mist flower (Eupatorium coelestinum), creeping spotflower (Acemella oppositifolia var. repens), pennywort (Hydrocotyle spp.), and bushy bluestem (Andropogon glomeratus)." (U.S. Fish and Wildlife Service, Houston, Texas, and the Texas General Land Office, Austin, Texas).

8. For all discharges and work proposed in tidal waters under NWPs 14 and 18, the applicant shall notify the Galveston District Engineer in accordance with the NWP General Condition 13. The Corps will coordinate with the National Marine Fisheries Service in accordance with NWP General Condition 13(e).

**NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND  
REQUEST FOR APPEAL**

Applicant: City of Corpus Christi		File Number: D-14185	Date: 10 Mar 2003
Attached is:		See Section below	
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of Permission)	A	
	PROFFERED PERMIT (Standard Permit or Letter of Permission)	B	
	PERMIT DENIAL	C	
	APPROVED JURISDICTIONAL DETERMINATION	D	
X	PRELIMINARY JURISDICTIONAL DETERMINATION	E	

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at <http://www.usace.army.mil/inet/functions/cw/cecwo/reg/> or Corps regulations at 33 CFR Part 331.

**A: INITIAL PROFFERED PERMIT:** You may accept or object to the permit.

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **OBJECT:** If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

**B: PROFFERED PERMIT:** You may accept or appeal the permit

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **APPEAL:** If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

**C: PERMIT DENIAL:** You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

**D: APPROVED JURISDICTIONAL DETERMINATION:** You may accept or appeal the approved jurisdictional determination (JD) or provide new information.

- **ACCEPT:** You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- **APPEAL:** If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

**E: PRELIMINARY JURISDICTIONAL DETERMINATION:** You do not need to respond to the Corps regarding the preliminary JD. The preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by providing new information for further consideration. Also you may provide new information for further consideration.

**SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT**

**REASONS FOR APPEAL OR OBJECTIONS:** (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons objections are addressed in the administrative record.)

**ADDITIONAL INFORMATION:** The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

**POINT OF CONTACT FOR QUESTIONS OR INFORMATION:**

If you have questions regarding this decision and/or the appeal process you may contact:  
Lloyd Mullins, Unit Leader  
U.S. Army Corps of Engineers, CESWG-PE-RCC  
Corpus Christi Regulatory Field Office  
5151 Flynn Parkway, Suite 306  
Corpus Christi, Texas 78411-4318  
Telephone 361-814-5847; FAX 361-814-5912

If you only have questions regarding the appeal process you may also contact:  
James E. Gilmore, Appeal Review Officer  
CESWD-ETO-R, 1100 Commerce Street  
Dallas, Texas 75242-0216  
Telephone: 214-767-2457; FAX 214-767-9021  
Email: [James.E.Gimore@swd02.usace.army.mil](mailto:James.E.Gimore@swd02.usace.army.mil)

**RIGHT OF ENTRY:** Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

<hr/> Signature of appellant or authorized agent.	Date:	Telephone number:
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# Texas Natural Resource Conservation Commission

## 401 Water Quality Certification Conditions for Nationwide Permits

### Attachment 1

Below are the 401 water quality certification conditions the Texas Natural Resource Conservation Commission (TNRCC) added to the January 15, 2002 issuance of Nationwide Permits (NWP), as described in the Federal Register (Part II, Vol. 67, No. 10, pages 2020-2095). These conditions were included as part of TNRCC's certification finalized on April XX, 2002.

Additional information regarding these conditions, including descriptions of the best management practices, can be obtained from the TNRCC by contacting the 401 Coordinator, MC-150, P. O. Box 13087, Austin, Texas 78711-3087 or from the appropriate U.S. Army Corps of Engineers district office.

#### **I. Erosion Control**

Disturbed areas must be stabilized to prevent the introduction of sediment to adjacent wetlands or water bodies during wet weather conditions (erosion). *At least one* of the following BMPs must be maintained and remain in place until the area has been stabilized for NWPs 3, 7, 12, 13, 14, 15, 17, 18, 19, 21, 22, 25, 27, 29, 30, 31, 32, 33, 36, 37, 38, 39, 40, 41, 42, 43, and 44. If the applicant does not choose one of the BMPs listed, an individual 401 certification is required.

- o Temporary Vegetation
- o Blankets/Matting
- o Mulch
- o Sod
- o Interceptor Swale
- o Diversion Dike

#### **II. Sedimentation Control**

Prior to project initiation, the project area must be isolated from adjacent wetlands and water bodies by the use of BMPs to confine sediment. Dredged material shall be placed in such a manner that prevents sediment runoff into water in the state, including wetlands. Water bodies can be isolated by the use of one or more of the required BMPs identified for sedimentation control. These BMP's must be maintained and remain in place until the dredged material is stabilized. *At least one* of the following BMPs must be maintained and remain in place until the area has been stabilized for NWPs 3, 7, 12, 13, 14, 15, 17, 18, 19, 21, 22, 25, 27, 29, 30, 31, 32, 33, 36, 37, 38, 39, 40, 41, 42, 43, and 44. If the applicant does not choose one of the BMPs listed, an individual 401 certification is required..

- o Sand Bag Berm
- o Rock Berm
- o Silt Fence
- o Hay Bale Dike

**SMALL CONSTRUCTION CONTRACT  
SAMPLE CONTRACT PACKAGE**  
Page 36 of 55  
New Document: Dec. 2004



**Attachment 2**  
**Reference to Nationwide Permits Best Management Practices Requirements**

NWP	Permit Description	Erosion Control	Sediment Control	Post Construction TSS
1	Aid to Navigation			
2	Structures in Artificial Canals			
3	Maintenance ( Repair, Replacement, rehabilitation of currently serviceable structure or fill)	X	X	
4	Fish and Wildlife Harvesting, Enhancement and Attraction Devices and Activities (Duck Blinds and Crab Traps)			
5	Scientific Measurement Devices			
6	Survey Activities			
7	Outfall Structures and Maintenance	X	X	
8	Oil and Gas Structures			
9	Structures in Fleeting And Anchorage Areas			
10	Mooring Buoys			
11	Temporary Recreation Structures			
12	Utility Line Activities	X	X	X
13	Bank Stabilization	X	X	
14	Linear Transportation Projects	X	X	X
15	U.S. Coast Guard Approved Bridges	X	X	
16	Return Water From Upland Disposal Areas			
17	Hydropower Projects	X	X	X
18	Minor Discharges (25yds)	X	X	X
19	Minor Dredging	X	X	
20	Oil Spill Cleanup			
21	Surface Coal Mining Activities	X	X	X
22	Removal of Vessels	X	X	

**Enclosure 3**

## Blankets and Matting

**Description:** Blankets and matting material can be used as an aid to control erosion on critical sites during the establishment period of protective vegetation. The most common uses are in channels, interceptor swales, diversion dikes, short, steep slopes, and on tidal or stream banks.

### **Materials:**

New types of blankets and matting materials are continuously being developed. The Texas Department of Transportation (TxDOT) has defined the critical performance factors for these types of products and has established minimum performance standards which must be met for any product seeking to be approved for use within any of TxDOT's construction or maintenance activities. The products that have been approved by TxDOT are also appropriate for general construction site stabilization. TxDOT maintains a web site at <http://www.dot.state.tx.us/insdot/orgchart/cmd/erosion/contents.htm> which is updated as new products are evaluated.

### **Installation:**

- Install in accordance with the manufacturer's recommendations.
- Proper anchoring of the material.
- Prepare a friable seed bed relatively free from clods and rocks and any foreign material.
- Fertilize and seed in accordance with seeding or other type of planting plan.
- Erosion stops should extend beyond the channel liner to full design cross-section of the channel.
- A uniform trench perpendicular to line of flow may be dug with a spade or a mechanical trencher.
- Erosion stops should be deep enough to penetrate solid material or below level of ruling in sandy soils.
- Erosion stop mats should be wide enough to allow turnover at bottom of trench for stapling, while maintaining the top edge flush with channel surface.

## Mulch

**Description:** Mulching is the process of applying a material to the exposed soil surface to protect it from erosive forces and to conserve soil moisture until plants can become established. When seeding critical sites, sites with adverse soil conditions or seeding on other than optimum seeding dates, mulch material should be applied immediately after seeding. Seeding during optimum seeding dates and with favorable soil and site conditions will not need to be mulched.

### **Materials:**

- Mulch may be small grain straw which should be applied uniformly.
- On slopes 15 percent or greater, a binding chemical must be applied to the surface.

April 4, 2002

-2-

- The first row of sod should be laid in a straight line with subsequent rows placed parallel to and butting tightly against each other.
- Lateral joints should be staggered to promote more uniform growth and strength.
- Wherever erosion may be a problem, sod should be laid with staggered joints and secured.
- Sod should be installed with the length perpendicular to the slope (on the contour).
- Sod should be rolled or tamped.
- Sod should be irrigated to a sufficient depth.
- Watering should be performed as often as necessary to maintain soil moisture.
- The first mowing should not be attempted until the sod is firmly rooted.
- Not more than one third of the grass leaf should be removed at any one cutting.

### Interceptor Swale

Interceptor swales are used to shorten the length of exposed slope by intercepting runoff, prevent off-site runoff from entering the disturbed area, and prevent sediment-laden runoff from leaving a disturbed site. They may have a v-shape or be trapezoidal with a flat bottom and side slopes of 3:1 or flatter. The outflow from a swale should be directed to a stabilized outlet or sediment trapping device. The swales should remain in place until the disturbed area is permanently stabilized.

### **Materials:**

- Stabilization should consist of a layer of crushed stone three inches thick, riprap or high velocity erosion control mats.
- Stone stabilization should be used when grades exceed 2% or velocities exceed 6 feet per second.
- Stabilization should extend across the bottom of the swale and up both sides of the channel to a minimum height of three inches above the design water surface elevation based on a 2-year, 24-hour storm.

### **Installation:**

- An interceptor swale should be installed across exposed slopes during construction and should intercept no more than 5 acres of runoff.
- All earth removed and not needed in construction should be disposed of in an approved spoils site so that it will not interfere with the functioning of the swale or contribute to siltation in other areas of the site.
- All trees, brush, stumps, obstructions and other material should be removed and disposed of so as not to interfere with the proper functioning of the swale.

## SEDIMENT CONTROL BMPS

### Sand Bag Berm

**Description:** The purpose of a sandbag berm is to detain sediment carried in runoff from disturbed areas. This objective is accomplished by intercepting runoff and causing it to pool behind the sand bag berm. Sediment carried in the runoff is deposited on the upstream side of the sand bag berm due to the reduced flow velocity. Excess runoff volumes are allowed to flow over the top of the sand bag berm. Sand bag berms are used only during construction activities in streambeds when the contributing drainage area is between 5 and 10 acres and the slope is less than 15%, i.e., utility construction in channels, temporary channel crossing for construction equipment, etc. Plastic facing should be installed on the upstream side and the berm should be anchored to the streambed by drilling into the rock and driving in "T" posts or rebar (#5 or #6) spaced appropriately.

### **Materials:**

- The sand bag material should be polypropylene, polyethylene, polyamide or cotton burlap woven fabric, minimum unit weight 4 oz/yd<sup>2</sup>, mullen burst strength exceeding 300 psi and ultraviolet stability exceeding 70 percent.
- The bag length should be 24 to 30 inches, width should be 16 to 18 inches and thickness should be 6 to 8 inches.
- Sandbags should be filled with coarse grade sand and free from deleterious material. All sand should pass through a No. 10 sieve. The filled bag should have an approximate weight of 40 pounds.
- Outlet pipe should be schedule 40 or stronger polyvinyl chloride (PVC) having a nominal internal diameter of 4 inches.

### **Installation:**

- The berm should be a minimum height of 18 inches, measured from the top of the existing ground at the upslope toe to the top of the berm.
- The berm should be sized as shown in the plans but should have a minimum width of 48 inches measured at the bottom of the berm and 16 inches measured at the top of the berm.
- Runoff water should flow over the tops of the sandbags or through 4-inch diameter PVC pipes embedded below the top layer of bags.
- When a sandbag is filled with material, the open end of the sandbag should be stapled or tied with nylon or poly cord.
- Sandbags should be stacked in at least three rows abutting each other, and in staggered arrangement.
- The base of the berm should have at least 3 sandbags. These can be reduced to 2 and 1 bag in the second and third rows respectively.

*April 4, 2002*

-6-

**SMALL CONSTRUCTION CONTRACT  
SAMPLE CONTRACT PACKAGE**  
Page 41 of 55  
New Document: Dec. 2004

**ATTACHMENT NO. 4  
Page 24 of 40**

- Silt fence should be securely fastened to each steel support post or to woven wire, which is in turn attached to the steel fence post. There should be a 3-foot overlap, securely fastened where ends of fabric meet.

### Triangular Filter Dike

**Description:** The purpose of a triangular sediment filter dike is to intercept and detain water-borne sediment from unprotected areas of limited extent. The triangular sediment filter dike is used where there is no concentration of water in a channel or other drainage way above the barrier and the contributing drainage area is less than one acre. If the uphill slope above the dike exceeds 10%, the length of the slope above the dike should be less than 50 feet. If concentrated flow occurs after installation, corrective action should be taken such as placing rock berm in the areas of concentrated flow. This measure is effective on paved areas where installation of silt fence is not possible or where vehicle access must be maintained. The advantage of these controls is the ease with which they can be moved to allow vehicle traffic and then reinstalled to maintain sediment

### **Materials:**

- Silt fence material should be polypropylene, polyethylene or polyamide woven or nonwoven fabric. The fabric width should be 36 inches, with a minimum unit weight of 4.5 oz/yd, mullen burst strength exceeding 190 lb/in<sup>2</sup>, ultraviolet stability exceeding 70%, and minimum apparent opening size of U.S. Sieve No. 30.
- The dike structure should be 6 gauge 6" x 6" wire mesh folded into triangular form being eighteen (18) inches on each side.

### **Installation:**

- The frame of the triangular sediment filter dike should be constructed of 6" x 6", 6 gauge welded wire mesh, 18 inches per side, and wrapped with geotextile fabric the same composition as that used for silt fences.
- Filter material should lap over ends six (6) inches to cover dike to dike junction; each junction should be secured by shoat rings.
- Position dike parallel to the contours, with the end of each section closely abutting the adjacent sections.
- There are several options for fastening the filter dike to the ground. The fabric skirt may be toed-in with 6 inches of compacted material, or 12 inches of the fabric skirt should extend uphill and be secured with a minimum of 3 inches of open graded rock, or with staples or nails. If these two options are not feasible the dike structure may be trenched in 4 inches.
- Triangular sediment filter dikes should be installed across exposed slopes during construction with ends of the dike tied into existing grades to prevent failure and should intercept no more than one acre of runoff.
- When moved to allow vehicular access, the dikes should be reinstalled as soon as possible, but always at the end of the workday.

**Hay:** This is very similar to straw with the exception that it is made of grasses and weeds and not grain stems. This form of mulch is very inexpensive and is widely available but does introduce weed and grass seed to the area. Like straw, hay is light and must be anchored.

- Straw bales should weigh a minimum of 50 pounds and should be at least 30 inches long.
- Bales should be composed entirely of vegetable matter and be free of seeds.
- Binding should be either wire or nylon string, jute or cotton binding is unacceptable. Bales should be used for not more than two months before being replaced.

**Installation:**

- Bales should be embedded a minimum of 4 inches and securely anchored using 2" x 2" wood stakes or 3/8" diameter rebar driven through the bales into the ground a minimum of 6 inches.
- Bales are to be placed directly adjacent to one another leaving no gap between them.
- All bales should be placed on the contour.
- The first stake in each bale should be angled toward the previously laid bale to force the bales together.

**Brush Berms**

Organic litter and spoil material from site clearing operations is usually burned or hauled away to be dumped elsewhere. Much of this material can be used effectively on the construction site itself. The key to constructing an efficient brush berm is in the method used to obtain and place the brush. It will not be acceptable to simply take a bulldozer and push whole trees into a pile. This method does not assure continuous ground contact with the berm and will allow uncontrolled flows under the berm.

Brush berms may be used where there is little or no concentration of water in a channel or other drainage way above the berm. The size of the drainage area should be no greater than one-fourth of an acre per 100 feet of barrier length; the maximum slope length behind the barrier should not exceed 100 feet; and the maximum slope gradient behind the barrier should be less than 50 percent (2:1).

**Materials:**

- The brush should consist of woody brush and branches, preferably less than 2 inches in diameter.
- The filter fabric should conform to the specifications for filter fence fabric.
- The rope should be 1/4 inch polypropylene or nylon rope.
- The anchors should be 3/8-inch diameter rebar stakes that are 18-inches long.

**Installation:**

- Lay out the brush berm following the contour as closely as possible.

*April 4, 2002*

- Earth Embankment: Place fill material in layers not more than 8 inches in loose depth. Before compaction, moisten or aerate each layer as necessary to provide the optimum moisture content of the material. Compact each layer to 95 percent standard proctor density. Do not place material on surfaces that are muddy or frozen. Side slopes for the embankment are to be 3:1. The minimum width of the embankment should be 3 feet.

- A gap is to be left in the embankment in the location where the natural confluence of runoff crosses the embankment line. The gap is to have a width in feet equal to 6 times the drainage area in acres.

- Geotextile Covered Rock Core: A core of filter stone having a minimum height of 1.5 feet and a minimum width at the base of 3 feet should be placed across the opening of the earth embankment and should be covered by geotextile fabric which should extend a minimum distance of 2 feet in either direction from the base of the filter stone core.

- Filter Stone Embankment: Filter stone should be placed over the geotextile and is to have a side slope which matches that of the earth embankment of 3:1 and should cover the geotextile/rock core a minimum of 6 inches when installation is complete. The crest of the outlet should be at least 1 foot below the top of the embankment.

#### Sediment Basins:

The purpose of a sediment basin is to intercept sediment-laden runoff and trap the sediment in order to protect drainage ways, properties and rights of way below the sediment basin from sedimentation. A sediment basin is usually installed at points of discharge from disturbed areas. The drainage area for a sediment basin is recommended to be less than 100 acres.

Sediment basins are effective for capturing and slowly releasing the runoff from larger disturbed areas thereby allowing sedimentation to take place. A sediment basin can be created where a permanent pond BMP is being constructed. Guidelines for construction of the permanent BMP should be followed, but revegetation, placement of underdrain piping, and installation of sand or other filter media should not be carried out until the site construction phase is complete.

#### Materials:

- Riser should be corrugated metal or reinforced concrete pipe or box and should have watertight fittings or end to end connections of sections.

- An outlet pipe of corrugated metal or reinforced concrete should be attached to the riser and should have positive flow to a stabilized outlet on the downstream side of the embankment.

- An anti-vortex device and rubbish screen should be attached to the top of the riser and should be made of polyvinyl chloride or corrugated metal.

#### Basin Design and Construction:

- For common drainage locations that serve an area with ten or more acres disturbed at one time, a sediment basin should provide storage for a volume of runoff from a two-year, 24-hour storm from each disturbed acre drained.

- The basin length to width ratio should be at least 2:1 to improve trapping efficiency. The shape may be



$A_s$  = Surface area of the basin, ft<sup>2</sup>

$C_d$  = Coefficient of contraction, approximately 0.6

$h$  = head of water above the hole, ft

Perforating the riser with multiple holes with a combined surface area equal to  $A_o$  is acceptable.

## POST-CONSTRUCTION TSS CONTROLS

### Retention/Irrigation Systems

**Description:** Retention/irrigation systems refer to the capture of runoff in a holding pond, then use of the captured water for irrigation of appropriate landscape areas. Retention/irrigation systems are characterized by the capture and disposal of runoff without direct release of captured flow to receiving streams. Retention systems exhibit excellent pollutant removal but can require regular, proper maintenance. Collection of roof runoff for subsequent use (rainwater harvesting) also qualifies as a retention/irrigation practice, but should be operated and sized to provide adequate volume. This technology, which emphasizes beneficial use of stormwater runoff, is particularly appropriate for arid regions because of increasing demands on water supplies for agricultural irrigation and urban water supply.

**Design Considerations:** Retention/irrigation practices achieve 100% removal efficiency of total suspended solids contained within the volume of water captured. Design elements of retention/irrigation systems include runoff storage facility configuration and sizing, pump and wet well system components, basin lining, basin detention time, and physical and operational components of the irrigation system. Retention/irrigation systems are appropriate for large drainage areas with low to moderate slopes. The retention capacity should be sufficient considering the average rainfall event for the area.

**Maintenance Requirements:** Maintenance requirements for retention/irrigation systems include routine inspections, sediment removal, mowing, debris and litter removal, erosion control, and nuisance control.

### Extended Detention Basin

**Description:** Extended detention facilities are basins that temporarily store a portion of stormwater runoff following a storm event. Extended detention basins are normally used to remove particulate pollutants and to reduce maximum runoff rates associated with development to their pre-development levels. The water quality benefits are the removal of sediment and buoyant materials. Furthermore, nutrients, heavy metals, toxic materials, and oxygen-demanding materials associated with the particles also are removed. The control of the maximum runoff rates serves to protect drainage channels below the device from erosion and to reduce downstream flooding. Although detention facilities designed for flood control have different design requirements than those used for water quality enhancement, it is possible to achieve these two objectives in a single facility.

**Design Considerations:** Extended detention basins can remove approximately 75% of the total suspended solids contained within the volume of runoff captured in the basin. Design elements of extended detention basins include basin sizing, basin configuration, basin side slopes, basin lining, inlet/outlet structures, and erosion controls. Extended detention basins are appropriate for large drainage areas with low to moderate slopes. The retention capacity should be sufficient considering the average rainfall event for the area.

as much as possible. The wetland should approximate a natural situation and unnatural attributes, such as rectangular shape or rigid channel, should be avoided.

Site considerations should include the water table depth, soil/substrate, and space requirements. Because the wetland must have a source of flow, it is desirable that the water table is at or near the surface. If runoff is the only source of inflow for the wetland, the water level often fluctuates and establishment of vegetation may be difficult. The soil or substrate of an artificial wetland should be loose loam to clay. A perennial baseflow must be present to sustain the artificial wetland. The presence of organic material is often helpful in increasing pollutant removal and retention. A greater amount of space is required for a wetland system than is required for a detention facility treating the same amount of area.

**Design Considerations:** Constructed wetlands can remove over 90% of the total suspended solids contained within the volume of runoff captured in the wetland. Design elements of constructed wetlands include wetland sizing, wetland configuration, sediment forebay, vegetation, outflow structure, depth of inundation during storm events, depth of micropools, and aeration. Constructed wetlands are appropriate for large drainage areas with low to moderate slopes.

**Maintenance Requirements:** Maintenance requirements for constructed wetlands include mowing, routine inspections, debris and litter removal, erosion control, nuisance control, structural repairs, sediment removal, harvesting, and maintenance of water levels.

### Wet Basins

**Description:** Wet basins are runoff control facilities that maintain a permanent wet pool and a standing crop of emergent littoral vegetation. These facilities may vary in appearance from natural ponds to enlarged, bermed (manmade) sections of drainage systems and may function as online or offline facilities, although offline configuration is preferable. Offline designs can prevent scour and other damage to the wet pond and minimize costly outflow structure elements needed to accommodate extreme runoff events.

During storm events, runoff inflows displace part or all of the existing basin volume and are retained and treated in the facility until the next storm event. The pollutant removal mechanisms are settling of solids, wetland plant uptake, and microbial degradation. When the wet basin is adequately sized, pollutant removal performance can be excellent, especially for the dissolved fraction. Wet basins also help provide erosion protection for the receiving channel by limiting peak flows during larger storm events. Wet basins are often perceived as a positive aesthetic element in a community and offer significant opportunity for creative pond configuration and landscape design. Participation of an experienced wetland designer is suggested. A significant potential drawback for wet ponds in arid climates is that the contributing watershed for these facilities is often incapable of providing an adequate water supply to maintain the permanent pool, especially during the summer months. Makeup water (i.e., well water or municipal drinking water) is sometimes used to supplement the rainfall/runoff process, especially for wet basin facilities treating watersheds that generate insufficient runoff.

**Design Considerations:** Wet basins can remove over 90% of the total suspended solids contained within the volume of runoff captured in the basin. Design elements of wet basins include basin sizing, basin configuration, basin side slopes, sediment forebay, inflow and outflow structures, vegetation, depth of permanent pool, aeration, and erosion control. Wet basins are appropriate for large drainage areas with low to moderate slopes.

necessary only to prevent the vegetation from dying.

### Vegetative Filter Strips

Filter strips, also known as vegetated buffer strips, are vegetated sections of land similar to grassy swales except they are essentially flat with low slopes, and are designed only to accept runoff as overland sheet flow. A schematic of a vegetated buffer strip is shown in Figure 3.3. They may appear in any vegetated form from grassland to forest, and are designed to intercept upstream flow, lower flow velocity, and spread water out as sheet flow. The dense vegetative cover facilitates conventional pollutant removal through detention, filtration by vegetation, and infiltration.

Filter strips cannot treat high velocity flows, and do not provide enough storage or infiltration to effectively reduce peak discharges to predevelopment levels for design storms. This lack of quantity control favors use in rural or low-density development; however, they can provide water quality benefits even where the impervious cover is as high as 50%. The primary highway application for vegetative filter strips is along rural roadways where runoff that would otherwise discharge directly to a receiving water passes through the filter strip before entering a conveyance system. Properly designed roadway medians and shoulders make effective buffer strips. These devices also can be used on other types of development where land is available and hydraulic conditions are appropriate.

Flat slopes and low to fair permeability of natural subsoil are required for effective performance of filter strips. Although an inexpensive control measure, they are most useful in contributing watershed areas where peak runoff velocities are low as they are unable to treat the high flow velocities typically associated with high impervious cover.

Successful performance of filter strips relies heavily on maintaining shallow unconcentrated flow. To avoid flow channelization and maintain performance, a filter strip should:

- Be equipped with a level spreading device for even distribution of runoff
- Contain dense vegetation with a mix of erosion resistant, soil binding species
- Be graded to a uniform, even and relatively low slope
- Laterally traverse the contributing runoff area

Filter strips can be used upgradient from watercourses, wetlands, or other water bodies along toes and tops of slopes and at outlets of other stormwater management structures. They should be incorporated into street drainage and master drainage planning. The most important criteria for selection and use of this BMP are soils, space, and slope.

#### **Design Considerations:**

- Soils and moisture are adequate to grow relatively dense vegetative stands
- Sufficient space is available
- Slope is less than 12%

April 4, 2002

-18-

**TRAFFIC CONTROL DETAILS**  
**EXHIBIT 13G**  
Page 47 of 55  
New Document: Dec. 2004

Attachment No. 4  
Page 36 of 40



**SHINER MOSELEY AND ASSOCIATES, INC.**  
ENGINEERS & CONSULTANTS

**MEMORANDUM**

4/30/03

J200.20203

**TO: ANGEL ESCOBAR**

**FROM: LYNDA KAHN**

**RE: AUTHORIZATION TO PROCEED WITH MAINTENANCE OF RINCON DRAINAGE DITCHES UNDER NATIONWIDE PERMIT 3**

As indicated in my emails (attached) to Joe Trejo and Joe Cavalier on March 10, 2003, the USACE agreed that the maintenance of the remaining drainage ditches between Burleson and Treasure Streets would qualify under Nationwide Permit (NWP) 3 and that the City could proceed with the work in these ditches without needing any additional authorization from the USACE.

The NWP Program is designed to regulate certain activities having no more than minimal adverse effects with little, if any, delay or paperwork. Specifically, NWP 3 authorizes maintenance activities related to the repair of a previously authorized structure (ditch) provided the structure is not put to a different use than that for which it was originally constructed. Minor deviations due to changes in construction techniques, materials or the like are authorized provided the adverse environmental effects resulting from such repair or rehabilitation are minimal.

The reason for segregating out the four (4) drainage ditches to the north was because of the extensive wetland vegetation that had re-established within these ditches.

**TRAFFIC CONTROL DETAILS  
EXHIBIT 13G  
Page 48 of 55  
New Document: Dec. 2004**

**Attachment No. 4  
Page 38 of 40**

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From: Self <lkahn@shinermoseley.com>  
To: reagan.r.richter@swg02.usace.army.mil  
Subject: NWP 3 - Authorization to Maintain Drainage Ditches  
Copies to: joet@cctexas.com, JosephC@cctexas.com  
Date sent: Mon, 10 Mar 2003 09:54:58 -0600

As per our discussion today with you and Lloyd, please omit reference to the additional 5 drainage ditches we mentioned in our letter to you dated February 21, 2003. As Lloyd indicated, maintenance of the subject ditches between Treasure Street and Burleson would qualify under NWP 3 and no further information is necessary for the City to proceed with this work.

If you have any questions please feel free to contact me. Thank you Reagan.

SMALL CONSTRUCTION CONTRACT  
SAMPLE CONTRACT PACKAGE  
Page 49 of 55  
New Document: Dec. 2004

Attachment No. 4  
Page 39 of 40

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From: Self <lkahn@shinermoseley.com>  
To: joet@cctexas.com  
Subject: Rincon Ditches  
Copies to: JosephC@cctexas.com  
Date sent: Mon, 10 Mar 2003 10:03:13 -0600

I spoke with the USACE this morning regarding maintenance of the drainage ditches along Rincon Canal A. Lloyd Mullins - Unit Leader, had originally advised that it would be prudent for us to include the additional 5 ditches between Burleson and Treasure Street with our original request to make sure all bases were covered. As a result, I resubmitted the request on February 21, 2003 to the USACE as they suggested.

Now, after re-evaluating things, the USACE has decided they don't want to bother with the additional paperwork and they've advised, as I knew already, that the maintenance of the remaining 5 ditches along W. Causeway will qualify under NWP 3 and that the City can proceed with the work without needing anything further from the USACE.

They also informed me that the authorization to clean out the 4 ditches that have wetland vegetation growing in them, between Beach Street and Surfboard Avenue, should be signed today and we should therefore have written authorization from the USACE this week.

Please call me if any questions. Thanks.

SMALL CONSTRUCTION CONTRACT  
SAMPLE CONTRACT PACKAGE  
Page 50 of 55  
New Document: Dec. 2004

Attachment No. 4  
Page 40 of 40

**Exhibit B**  
**(Revised October, 1997)**

**INSURANCE REQUIREMENTS**

**I. CONTRACTOR'S LIABILITY INSURANCE**

- A. The Contractor shall not commence work under this Agreement until he/she has obtained all insurance required herein and such insurance has been approved by the City. Nor shall the Contractor allow any subcontractor to commence work until all similar insurance required of the subcontractor has been so obtained.
- B. The Contractor shall furnish two (2) copies of certificates, with the City named as an additional insured, showing the following minimum coverage in an insurance company acceptable to the City.

TYPE OF INSURANCE	MINIMUM INSURANCE COVERAGE
<b>30-Day Notice of Cancellation required on all certificates</b>	<b>Bodily Injury and Property Damage</b>
Commercial General Liability including: 1. Commercial Form 2. Premises – Operations 3. Explosion and Collapse Hazard 4. Underground Hazard 5. Products/ Completed Operations Hazard 6. Contractual Insurance 7. Broad Form Property Damage 8. Independent Contractors 9. Personal Injury	\$2,000,000 COMBINED SINGLE LIMIT
AUTOMOBILE LIABILITY--OWNED NON-OWNED OR RENTED	\$1,000,000 COMBINED SINGLE LIMIT
WORKERS' COMPENSATION	WHICH COMPLIES WITH THE TEXAS WORKERS' COMPENSATION ACT AND PARAGRAPH II OF THIS EXHIBIT
EMPLOYERS' LIABILITY	\$100,000
<del>EXCESS LIABILITY</del>	<del>\$1,000,000 COMBINED SINGLE LIMIT</del>
PROFESSIONAL POLLUTION LIABILITY/ ENVIRONMENTAL IMPAIRMENT COVERAGE Not limited to sudden & accidental discharge; to include long-term environmental impact for the disposal of contaminants	\$2,000,000 COMBINED SINGLE LIMIT  <input type="checkbox"/> REQUIRED <input checked="" type="checkbox"/> NOT REQUIRED
BUILDERS' RISK	See Section B-6-11 and Supplemental Insurance Requirements <input type="checkbox"/> REQUIRED <input checked="" type="checkbox"/> NOT REQUIRED
INSTALLATION FLOATER	\$100,000 Combined Single Limit See Section B-6-11 and Supplemental Insurance Requirements <input type="checkbox"/> REQUIRED <input checked="" type="checkbox"/> NOT REQUIRED

- C. In the event of accidents of any kind, the Contractor shall furnish the City with copies of all reports of such accidents at the same time that the reports are forwarded to any other interested parties.

## II. HOLD HARMLESS

- A. Contractor agrees to indemnify, save harmless and defend the City of Corpus Christi, and its agents, servants, and employees, and each of them against and hold it and them harmless from any and all lawsuits, claims, demands, liabilities, losses and expenses, including court costs and attorneys' fees, for or on account of any injury to any person, or any death at any time resulting from such injury, or any damage to any property, which may arise or which may be alleged to have arisen out of or in connection with the work covered by this contract. The foregoing indemnity shall apply except if such injury, death or damage is caused solely by the negligence or other fault of the City of Corpus Christi, its agents, servants, or employees or any other person indemnified hereunder.
- B. The Contractor shall obtain workers' compensation insurance coverage through a licensed insurance company or through self-insurance obtained in accordance with Texas law. If such coverage is obtained through a licensed insurance company, then the contract for coverage shall be written on a policy and endorsements approved by the Texas State Board of Insurance.

If such coverage is provided through self-insurance, then within ten (10) calendar days after the date the City requests that the Contractor sign the contract documents, the Contractor shall provide the City with a copy of its certificate of authority to self-insure its workers' compensation coverage, as well as a letter, signed by the Contractor, stating that the certificate of authority to self-insure remains in effect and is not the subject of any revocation proceeding then pending before the Texas Workers' Compensation Commission. Further, if at any time before final acceptance of the Work by the City, such certificate of authority to self-insure is revoked or is made the subject of any proceeding which could result in revocation of the certificate, then the Contractor shall immediately provide written notice of such facts to the City, by certified mail, return receipt requested directed to: City of Corpus Christi, Department of Engineering Services, P. O. Box 9277, Corpus Christi, Texas 78469 - Attention: Contract Administrator.

Whether workers' compensation insurance coverage is provided through a licensed insurance company or through self-insurance, the coverage provided must be in an amount sufficient to assure that all workers' compensation obligations incurred by the Contractor will be promptly met.



- C. **Builder's Risk Coverage:** Contractor will be responsible for providing builder's risk insurance coverage for the term of the contract up to and including the date the City finally accepts the project or work. Builder's risk coverage shall be an "All Risk" form. The policy shall be a completed value form. The Contractor shall provide such builder's risk coverage at least in the amount of \$ -0- (NOT REQUIRED) DOLLARS) which is estimated to be the value at completion of the real or personal property to be constructed, repaired or otherwise improved under the contract.

Contractor shall be responsible for paying all costs necessary to procure such builder's risk insurance coverage, including any deductible. The City shall be named an **additional** insured on any policy providing such insurance coverage.

III. On the certificate of insurance:

- o The **City of Corpus Christi** is to be named as an **additional insured** on the liability coverage, except for workers' compensation coverage.
- o Should your insurance company elect to use the standard ACORD form, the **cancellation clause** (bottom right) **shall be amended** by adding the wording "changed or" between "be" and "cancelled" and deleting the words "endeavor to" and the wording after "left". If the cancellation clause is not amended in the ACORD form, then **endorsements** shall be submitted.
- o The **name of the project** also needs to be listed under "description of operations".
- o At least **10-day written notice** of change or cancellation will be required.

IV. A completed **Disclosure of Interest** must be submitted with your proposal.



**CITY OF CORPUS CHRISTI  
DISCLOSURE OF INTERESTS**

City of Corpus Christi Ordinance 17112, as amended, requires all persons or firms seeking to do business with the City to provide the following information. Every question must be answered. If the question is not applicable, answer with "NA".

**FIRM NAME:** \_\_\_\_\_

**STREET:** \_\_\_\_\_ **CITY:** \_\_\_\_\_ **ZIP:** \_\_\_\_\_

**FIRM is:** 1. Corporation \_\_\_\_\_ 2. Partnership \_\_\_\_\_ 3. Sole Owner \_\_\_\_\_ 4. Association \_\_\_\_\_  
5. Other \_\_\_\_\_

**DISCLOSURE QUESTIONS**

If additional space is necessary, please use the reverse side of this page or attach separate sheet.

**1. State the names of each "employee" of the City of Corpus Christi having an "ownership interest" constituting 3% or more of the ownership in the above named "firm".**

Name \_\_\_\_\_ Job Title and City Department (if known) \_\_\_\_\_  
\_\_\_\_\_

**2. State the names of each "official" of the City of Corpus Christi having an "ownership interest" constituting 3% or more of the ownership in the above named "firm".**

Name \_\_\_\_\_ Title \_\_\_\_\_  
\_\_\_\_\_

**3. State the names of each "board member" of the City of Corpus Christi having an "ownership interest" constituting 3% or more of the ownership in the above named "firm".**

Name \_\_\_\_\_ Board, Commission or Committee \_\_\_\_\_  
\_\_\_\_\_

**4. State the names of each employee or officer of a "consultant" for the City of Corpus Christi who worked on any matter related to the subject of this contract and has an "ownership interest" constituting 3% or more of the ownership in the above named "firm".**

Name \_\_\_\_\_ Consultant \_\_\_\_\_  
\_\_\_\_\_

**CERTIFICATE**

I certify that all information provided is true and correct as of the date of this statement, that I have not knowingly withheld disclosure of any information requested; and that supplemental statements will be promptly submitted to the City of Corpus Christi, Texas as changes occur.

Certifying Person: \_\_\_\_\_ Title: \_\_\_\_\_  
(Type or Print)

Signature of Certifying Person: \_\_\_\_\_ Date: \_\_\_\_\_

### DEFINITIONS

- a. "Board Member". A member of any board, commission or committee appointed by the City Council of the City of Corpus Christi, Texas.
- b. "Employee". Any person employed by the City of Corpus Christi, Texas, either on a full or part time basis, but not as an independent contractor.
- c. "Firm". Any entity operated for economic gain, whether professional, industrial or commercial and whether established to produce or deal with a product or service, including but not limited to, entities operated in the form of sole proprietorship, as self-employed person, partnership, corporation, joint stock company, joint venture, receivership or trust and entities which, for purposes of taxation, are treated as non-profit organizations.
- d. "Official". The Mayor, members of the City Council, City Manager, Deputy City Manager, Assistant City Managers, Department and Division Heads and Municipal Court Judges of the City of Corpus Christi, Texas.
- e. "Ownership Interest". Legal or equitable interest, whether actually or constructively held, in a firm, including when such interest is held through an agent, trust, estate or holding entity. "Constructively held" refers to holding or control established through voting trusts, proxies or special terms of venture or partnership agreements.
- f. "Consultant". Any person or firm, such as engineers and architects, hired by the City of Corpus Christi for the purpose of professional consultation and recommendation.



City of  
Corpus  
Christi

ADDENDUM NO. 2

July 12, 2007

TO: ARCHITECTURAL AND ENGINEERING FIRS INTERESTED IN  
CONTRACTING WITH THE CITY OF CORPUS CHRISTI, TEXAS

SUBJECT: CITY OF CORPUS CHRISTI'S PLAN PREPARATION STANDARDS AND  
CONTRACT FORMAT DOCUMENTS

I. TAB 2 - CITY OF CORPUS CHRISTI PLAN PREPARATION STANDARDS AND  
COMPACT DISC (CD) INCLUDED IN ADDENDUM NO. 1, DATED JUNE 23, 2005

A. Section 8 - Specifications

1. DELETE: The current Specification Section 025220  
FLEXIBLE BASE - CALICHE (S-24) Rev 11/2/99,  
in its entirety.

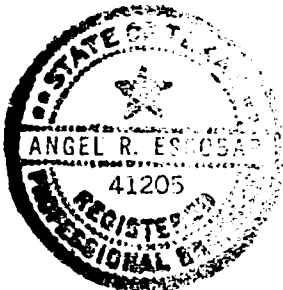
ADD: The new Specification Section 025220 FLEXIBLE  
BASE - CHEMICALLY STABILIZED (S-24) Rev  
6/21/07, (see Attachment No. 1), in lieu  
thereof.

2. DELETE: The current Specification Section 025222  
FLEXIBLE BASE - HIGH-STRENGTH (S-24A) R-3/91,  
in its entirety.

ADD: The new Specification Section 025222 FLEXIBLE  
BASE - HIGH STRENGTH (S-24A) Rev 6/21/07 (see  
Attachment No. 2), in lieu thereof.

Please acknowledge receipt of this ADDENDUM, BY RETURN FAX.

END OF ADDENDUM NO. 2



*Angel R. Escobar*  
Ángel R. Escobar, P. E.  
Director of Engineering Services

7/11/07

ARE/rs

Attachments: No. 1, Specification Section 025220 (S-24), Rev 6/21/07  
No. 2, Specification Section 025222 (S-24A), Rev 6/21/07

ADDENDUM NO. 2  
Page 1 of 1

SECTION 025220

FLEXIBLE BASE - CHEMICALLY STABILIZED (S-24)

1. Description

This Specification shall govern all work for furnishing and placing Flexible Base - Chemically Stabilized required to complete the project.

2. Material

The material shall consist of Caliche, limestone, crushed stone, crushed gravel, Crushed Concrete, and sand, and shall be free of vegetation. The material shall be approved by the Engineer. All acceptable material shall be screened and the oversize shall be crushed and returned to the screened material in such a manner that a uniform product will be produced.

- |                               |                   |
|-------------------------------|-------------------|
|                               | <u>Percentage</u> |
| (a) Gradation Limits (Before) |                   |
| Passing 2" Sieve              | 100               |
| Passing 1" Sieve .....        | 75-95             |
| Passing 3/8" Sieve .....      | 40-75             |
| Passing No. 4 Sieve .....     | 30-60             |
| Passing No. 10 Sieve .....    | 20-45             |
| Passing No. 40 Sieve .....    | 15-30             |
- (b) A representative sample of the raw base material shall be slaked for twenty-four (24) hours and then the washed minus 40 material shall have:
- |                               |         |
|-------------------------------|---------|
| Liquid Limit (L.L.) .....     | 45 max. |
| Plasticity Index (P.I.) ..... | 16 max. |
- (c) A representative sample of the material shall be tested in accordance with ASTM C-131 for abrasion loss. The maximum loss shall not exceed 55%.
- (d) All "Flexible Base" shall be stabilized with lime or Portland Cement at a minimum application rate of 1.8 lb. of lime or Portland Cement per square yard for each 1" of in place thickness.
- (e) The stabilized material shall be tested in accordance with AASHTO T193 and the CBR shall not be less than 95 at a density of 100% (modified proctor) AASHTO T180, based on 140 degree curing for of the samples for 72 hours.

Lime or Portland Cement slurry for admix shall be 3.3 pounds minimum of Lime or Portland Cement per gallon of slurry. Lime shall conform to standard specification "Lime Stabilization", Section 025210.

Portland Cement shall be Type I in accordance with ASTM C150.

3. Testing

The City will engage a laboratory and pay for one test each gradation, L.L., P.I., and moisture-density relation, and necessary field densities. The Engineer may call for additional tests at any time. The cost of all retests, in case of failure to meet specifications, will be deducted from the Contractor's payment. The City will pay for proctor and soil constants and abrasion tests, with or without lime admix, at the rate of one test for each

1,500 square yards. If material changes and this ratio of tests increases, the Contractor shall pay the cost of additional tests required by the Engineer. The Engineer may waive testing and/or lime admix for small amounts for unimportant uses.

#### 4. Construction Methods

Prior to placement of base, the surface of the previous course shall be finished true to line and grade as established and in conformity with the typical section shown on the plans. Grade tolerance shall be generally 1/2 inch, and highs and lows must approximately balance.

Base shall be tested prior to placement.

Piles and windrows shall be broken down to the bottom and all nests of coarse or loose material shall be corrected.

Mix uniformly, prior to the addition of lime or Portland Cement. Slurry admix shall be spread at rate required and shall be placed only on that area where mixing can be completed that day. Material shall be mixed with pulverizing type mixer, so designed for this specific purpose, until mixed to the satisfaction of the Engineer.

Material shall be shaped and rolled after mixing and allowed to set at least 48 hours before compaction. Moisture content must be maintained in the material during the 48-hour period. Material shall be sprinkled or aerated to optimum moisture and compacted in layers (6 inches maximum loose) by approved power-drawn roller to uniform density of 95% modified proctor (AASHTO T180) on the wet side of optimum. Use mechanical tamps in areas inaccessible to rollers.

The surface of the compacted base shall be primed in accordance with Section 025412, after meeting moisture/density requirements.

On completion of compaction and priming, the surface shall be smooth and conform to lines, grades, and sections shown on the plans. Areas with any deviation in excess of 1/4 inch in cross-section and in lengths of 16 feet measured longitudinally shall be corrected by loosening, adding or removing materials, reshaping, and re-compacting by re-priming and rolling.

Moisture and density shall be maintained until the paving process is complete.

#### 5. Measurement and Payment

Unless indicated otherwise in the Proposal, Flexible Base - Chemically Stabilized shall be measured by the square yard. Payment includes all materials, royalty, hauling, labor and equipment to complete.

Lime or Portland Cement shall be measured by the ton and paid under other bid item, when included in the proposal.

Prime coat shall be measured by the gallon per square yard, when included in the proposal.

SECTION 025222  
FLEXIBLE BASE - HIGH STRENGTH (S-24A)

1. Description

This Specification shall govern all work for furnishing and placing Flexible Base - High Strength required to complete the project.

2. Material

The material shall consist of crushed Portland cement concrete, crushed asphalt concrete, crushed masonry, crushed gravel, crushed stone, and sand, and shall be free of vegetation. The material shall be approved by the Engineer. All acceptable material shall be screened and the oversize shall be crushed and returned to the screened material in such a manner that a uniform product will produced.

Percentage

(a) Gradation Limits (Before Compaction)

Passing 2" Sieve .....	100
Passing 1" Sieve .....	75-95
Passing 3/8" Sieve .....	40-75
Passing No. 4 Sieve .....	30-60
Passing No. 10 Sieve .....	20-45
Passing No. 40 Sieve .....	15-30

(b) A representative sample of the material shall be slaked for twenty-four (24) hours and then the washed minus 40 material shall have:

Liquid Limit (L.L.) .....	25 max.
Plasticity Index (P.I.) .....	10 max.

(c) A representative sample of the material shall be tested in accordance with ASTM C-131 for abrasion loss. The maximum loss shall not exceed 45%.

(d) A representative sample of material shall be tested in accordance with AASHTO T193 and the CBR shall not be less than 95 at a density of 100% (modified proctor) AASHTO T180.

3. Testing

The City will engage a laboratory and pay for one test each gradation, L.L., P.I., standard proctor, moisture-density relation, CBR, and necessary field densities. The Engineer may call for additional tests at any time. The cost of all retests, in case of failure to meet specifications, will be deducted from the Contractor's payment. The City will pay for proctor and soil constants and abrasion tests, at the rate of one test for each 1,500 square yards. If material changes and this ratio of one tests increase, the Contractor shall pay the cost of additional tests required by the Engineer.

4. Construction Methods

Prior to placement of base, the surface of the previous course shall be finished true to line and grade as established and in conformity with the typical section shown on the plans. Grade tolerance shall be generally  $\pm$  inch, and highs and lows must approximately balance.

Base shall be delivered and spread the same day if possible (no later than the next day).

Base shall be mixed as required to produce a uniform mixture with water. Base shall be placed in uniform lifts not to exceed 6" and compacted to a minimum of 95% of modified proctor, density AASHTO T180 at a moisture content of not less than 1% point below optimum moisture nor more than 3% points above optimum moisture.

The surface of the compacted base, after meeting moisture/density requirements, shall be primed in accordance with Section 025412.

On completion of compaction and priming, the surface shall be smooth and conform to lines, grades, and sections shown on the plans.

Moisture and density shall be maintained until the paving process is complete.

#### 5. Measurement and Payment

Unless indicated otherwise in the Proposal, Flexible Base - High Strength shall be measured by the square yard. Payment includes all materials, royalty, hauling, labor and equipment to complete.

Prime coat shall be measured by the gallon per square yard when included in the proposal.



STANDARD SPECIFICATIONS INDEX  
(Reference Specification Listing)

VOLUME I

- 020 SITE ASSESSMENTS & CONTROLS  
020100 Survey Monuments S49 (Includes Diagram)  
030020 Portland Cement Concrete  
032020 Reinforcing Steel  
038000 Concrete Structures  
020200 Field Office  
020400\* Automated Stormwater Sampling System  
020600\* Groundwater Monitoring Well S124
- 021 SITE PREPARATION  
021010 Project Signs (Includes 2 Diagrams)  
021020 Site Clearing & Stripping S5  
021040 Site Grading  
021040 Site Grading S6  
021080\* Removing Abandoned Structures S55
- 022 EARTHWORK  
022020 Excavation & Backfill for Utilities & Sewers S9  
022022 Trench Safety for Excavations  
022100 Select Material  
022022 Trench Safety for Excavations  
022040 Street Excavation S10  
022060 Channel Excavation S11  
022080 Embankment  
022080 Embankment S13  
022100 Select Material S15  
022300\* Landfill Clay Liner S77  
022302\* Landfill Sector Excavation S21  
022420 Silt Fence S97  
022430\* Cellular Confinement System
- 023 FOUNDATIONS, BORINGS, PILES & CAISSONS  
023020 Jacking, Boring, Tunneling S65  
022020 Excavation & Backfill for Utilities  
023040 Tunnel Liner Plate S65A  
023080 Timber Foundation Piles S95
- 024 RAILROAD & MARINE  
024020 Railroad Tracks S130  
024060 Marine Timber S93  
024080 Timber Piling S94
- 025 ROADWAY

0252.....SUBGRADES AND BASES

025202 Scarifying and Reshaping Base Course S23

025205 Pvmt. Repair, Curb, Gutter, Sdwk. Dwy. Replacement

025220 Flexible Base Caliche

025220 Flexible Base Caliche

025612 Concrete Sidewalks & Driveways

025610 Concrete Curb & Gutter

025612 Concrete Sidewalks & Driveways

030020 Portland Cement Concrete S40

032020 Reinforcing Steel S42 (Includes Diagram)

038000 Concrete Structures S41

025208 Soil Cement S17

025404 Asphalts, Oils, & Emulsions

025418 Surface Treatment

025210 Lime Stabilization S28

025213\* Asphalt Stabilized Base S26

025215\* Cement Stabilized Caliche Base S47

025220R Flexible Base - Chemically Stabilized S24

025210 Lime Stabilization

025412 Prime Coat

025222R Flexible Base High Strength S24A

025412 Prime Coat

025224\* Flexible Base - Shell with Sand S25

0254.....ASPHALTS AND SURFACES

025402 Planing Asphalt Surfaces S27A

025404 Asphalts, Oils, & Emulsions S29

025407 Asphalt Recycling In Place (Hot Recycle Method) S27

025424 Hot Mix Asphalt Concrete Pavement

025805 Abbreviated Pavement Markings

025410 Crack Sealing - Asphalt S36

025404 Asphalts, Oils, & Emulsions

025412 Prime Coat S30

025404 Asphalts, Oils, & Emulsions

025414\* Aggregate for Surface Treatment & Seals S35

025416\* Seal Coat S31

025404 Asphalts, Oils, & Emulsions

025414 Aggregate for Surface Treatment & Seals

025418\* Surface Treatment S32

025404 Asphalts, Oils, & Emulsions

025414 Aggregate for Surface Treatment & Seals

025419\* Slurry Seal S37

025422\* Cold Mix Limestone Rock Asphalt Pavement S33

025404 Asphalts, Oils, & Emulsions

025424 Hot Mix Asphalt Concrete Pavement S34

025404 Asphalts, Oils, & Emulsions

0256.....CONCRETE WORK

025608 Inlets S63

030020 Portland Cement Concrete S40

032020 Reinforcing Steel S42 (Includes Diagram)

038000 Concrete Structures

055420 Frames, Grates, Rings, & Covers

025610 Concrete Curb & Gutter S52

030020 Portland Cement Concrete S40

032020 Reinforcing Steel S42 (Includes Diagram)

025612 038000 Concrete Structures  
 Concrete Sidewalks & Driveways S53  
 030020 Portland Cement Concrete S40  
 032020 Reinforcing Steel S42 (Includes Diagram)  
 038000 Concrete Structures  
 025614 Concrete Curb Ramps  
 030020 Portland Cement Concrete S40  
 032020 Reinforcing Steel S42 (Includes Diagram)  
 038000 Concrete Structures  
 097020 Exposed Aggregate Finish for Concrete  
  
 0258.....TRAFFIC CONTROLS & DEVICES  
 025802 Temporary Traffic Controls During Construction  
 025803 Traffic Signal Adjustments  
 025805 Abbreviated Pavement Markings S101  
 025807 Pavement Markings (Painted or Thermoplastic) S45  
 025813 Preformed Striping & Emblems  
 025816 Raised Pavement Markers & Traffic Buttons  
 025818 Reference - Pvmt Markers (Tx DOT D-9-4200)  
 025820 Reference - Traffic Buttons (Tx DOT D-9-4300)  
 025828 Bituminous Adhesive for Pvmt Marker (Tx DOT  
 D-9-6130)

026 UTILITIES

0262.....GENERAL  
 026201 Waterline Riser Assembly S79  
 026202 Hydrostatic Testing of Pressure Systems S89  
 026204\* PVC Pipe for FM's & Large San Mains ASTM D2241 S91  
 026206 Ductile Iron Pipe & Fittings S81  
 026210 PVC Pipe for Waterlines & San FM's AWWA C900/C905  
 026212 Molecularly Oriented PVC Pipe (MOP) AWWA C909  
 026214 Grouting Abandoned Utility Lines S3  
  
 0264.....WATERLINES  
 026402 Waterlines S88  
 022020 Excavation & Backfill for Utilities  
 022022 Trench Safety for Excavations  
 026206 Ductile Iron Pipe & Fittings S81  
 026210 PVC Pipe for Water & San FM's AWWA C900/C905  
 026212 Molecularly Orien. PVC Pipe (MOP) AWWA 909  
 026404 Water Services S87  
 026406 Private Water Service Lines S112  
 Form WS-1, Form W-2, Foundation Exhibit, Site Plan  
 026409 Tapping Sleeves & Valves S84  
 026411 Gate Valves for Waterlines S85  
 026413 Butterfly Valves for Waterlines S85B  
 026416 Fire Hydrants S86  
  
 0266.....SANITARY FORCE MAINS  
 026602 Sanitary Sewer Force Mains S69  
 022020 Excavation & Backfill for Utilities  
 022022 Trench Safety for Excavations  
 026206 Ductile Iron Pipe & Fittings S81  
 026204 PVC Pipe-FM's & Large San Mains ASTM D2241

026210 PVC Pipe for Water & San FM's AWWA C900/C905  
 026212 Molecularly Oriented PVC Pipe (MOP) AWWA 909  
 026604 Air Release Valves for Wastewater S96  
 026608\* Polyethylene Pipe for Sliplining Force Mains S59A  
 026610 Reinforced Plastic Mortar Liner Pipe for San FM's  
 026612 Fiberglass Pipe for Slip Lining S67A

027 SEWERS & DRAINAGE

0272.....GENERAL

027202 Manholes S62  
     030020 Portland Cement Concrete  
     032020 Reinforcing Steel S42 (Includes Diagram)  
 027203 Vacuum Testing of Sanitary Sewer Manhole and  
     Structures  
 027205 Fiberglass Manholes S58A  
     030020 Portland Cement Concrete  
 027207\* Rehab. of Manholes with Shotcrete S74

0274.....STORM SEWERS

027402 Reinforced Concrete Pipe Culverts S60  
     022020 Excavation & Backfill for Utilities  
     022022 Trench Safety for Excavations  
     022100 Select Material  
 027404 Concrete Box Culverts S66  
     022020 Excavation & Backfill for Utilities  
     022022 Trench Safety for Excavations  
     022100 Select Material  
 027406\* Corrugated Metal Pipe S46  
 027414\* Culvert Rehabilitation Flexible Lining Process

0276.....SANITARY SEWERS (GRAVITY)

027602 Gravity Sanitary Sewers S61  
     022020 Excavation & Backfill for Utilities  
     022022 Trench Safety for Excavations  
     022100 Select Material  
 027604 Disposal of Waste From Sanitary Sewer Cleaning  
 027606 Sanitary Service Lines  
 027608 Private Sewer Services S39  
     Form WS-1, Form S-2, Foundation Exhibit, Site Plan  
 027610 Televised Inspection of Conduits  
 027614 Cured in Place Pipe (CIPP) for Rehab. of Sewers  
     022020 Excavation & Backfill for Utilities  
     022022 Trench Safety for Excavations  
     022100 Select Material  
     027604 Disposal of Waste From Sanitary Sewer  
     027610 Televised Inspection of Conduits  
 027616 Profiled Wall HD Polyethylene for Slip Lining S73  
 027618 Sanitary Sewer Rehab. - Pipe Insertion Method S75

028 SITE IMPROVEMENTS & LANDSCAPING

028020 Seeding S14  
 028040 Sodding S8  
 028060 \*Landscape Planting (Palm Trees) S7

028200	Mail Box Relocation	
028300	Fence Relocation	S12
028320	Chain Link Fence	S70
028340	Chain Link Security Fence	S71
	030020	Portland Cement Concrete S40
028360	Chain Link Security Fence Special Application	S71A
	030020	Portland Cement Concrete S40
028370	Barbed Wire Fence	S48
	030020	Portland Cement Concrete S40
028380	*Sanitary Landfill Fence	S76
028810	*Recreational Equipment	S99
030	CONCRETE, GROUT	
	030020	Portland Cement Concrete S40
	032020	Reinforcing Steel S42 (Includes Diagram)
	036020	Stucco and Plaster S123
	037040	Epoxy Compounds S44
	030020	Portland Cement Concrete S40
038000	Concrete Structures	S41
	030020	Portland Cement Concrete S40
040	MASONRY	
	041020	Structural Clay Tile for Floors & Sidewalks S22
	041080	Brick Pavers S50
	042020	Concrete Masonry Unit S121
050	METALS	
	050200	*Welding S43 (Includes Diagram)
	053700	*Landfill Vehicle Scale System S119
	053820	*Pre-Fabricated Steel Bridge S2
	055420	Frames, Grates, Rings, & Covers S57
	055440	Aluminum Grating S110
	057220	Aluminum Handrails S98
060	WOOD & PLASTIC	
	061810	*Shelter Construction S102
	066000	*V-Notched Weir Plate S111
070	BUILDINGS	
	070020	*Asbestos Removal S1
	070120	*Rough And Finish Carpentry S120
	074320	*Cedar Shingle Roofing S4
	075220	*Built-Up Asphalt Roof System S108
	078220	*Concrete Tile Roofing S122
090	FINISHES	
	097020	Exposed Aggregate Finish for Concrete S51
		025612 Concrete Sidewalks & Driveways S53
		038000 Concrete Structures S41
	099020	Painting S56

100 SPECIALS

110 EQUIPMENT  
113100 \*Fiberglass Reinforced Plastic Wet Well S64  
113120 \*Wet Well Ventilation System S113  
113130 \*Chlorination System S19

120 FURNISHINGS

130 SPECIAL CONSTRUCTION  
132010 Ground Storage Tank for Water (Bolted Steel)

150 MECHANICAL  
1506.....MECHANICAL & PROCESS PIPE & FITTINGS  
150620 \*Plumbing  
026202 Hydrostatic Testing of Pressure Systems S89

1510.....MECHANICAL & PROCESS VALVES  
151010 Gate Valves S103  
099020 Painting S56  
151020 Check Valves S104  
099020 Painting S56  
151030 Eccentric Plug Valves S105  
099020 Painting S56  
151040 Surge Relief Valves S106  
151050 Shear Gates S107  
151060 Flap Gates S76A

1515.....FLOW METERS  
151502 \*Ultrasonic Doppler Flow Meter

1516.....PUMPS & COMPRESSORS  
151620 \*Submersible Pumps for Wastewater S114  
151630 \*Propeller Pumps S38  
151640 \*Submersible Grinder Pumps for Wastewater

160 ELECTRICAL  
161001 \*Lift Station Electrical S18

SECTION 020100  
SURVEY MONUMENT (S-49)

1. Description

This specification shall govern all work required for survey monuments required to complete the project.

2. Materials

- a) Brass Monument Marker - 2" diameter brass disk with 3" anchor rod to be provided by the City.
- b) Concrete - Class A in accordance with Section 030020.
- c) Rebar - No. 5 Bar, 3 feet long grade 40 or 60 in accordance with Section 032020.

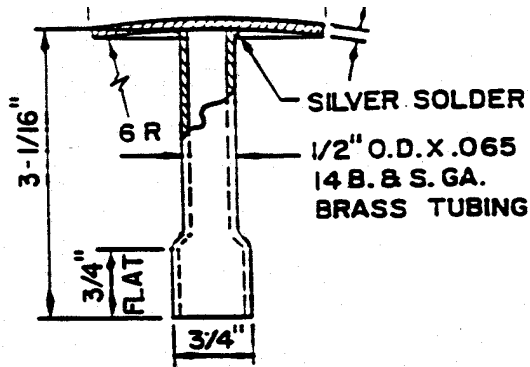
3. Construction Methods

The location of survey markers shall be established in the field by the Engineer. The Engineer will provide four off-set stakes with intersecting stringline for precise location of horizontal alignment to which the brass disk shall be positioned. The Contractor shall excavate hole and set form work. Forms shall be placed to a tolerance which allows the precise position of the brass disk to be within one inch of the center of the concrete base. The Contractor shall place concrete in accordance with Standard Specification Section 038000. At the appropriate time, the Contractor shall place the brass disk (provided by City) to its precise position in the uncured concrete. The brass disk shall be placed to within " tolerance of its precise location. Positioning of the base and brass disk will be checked by the Engineer.

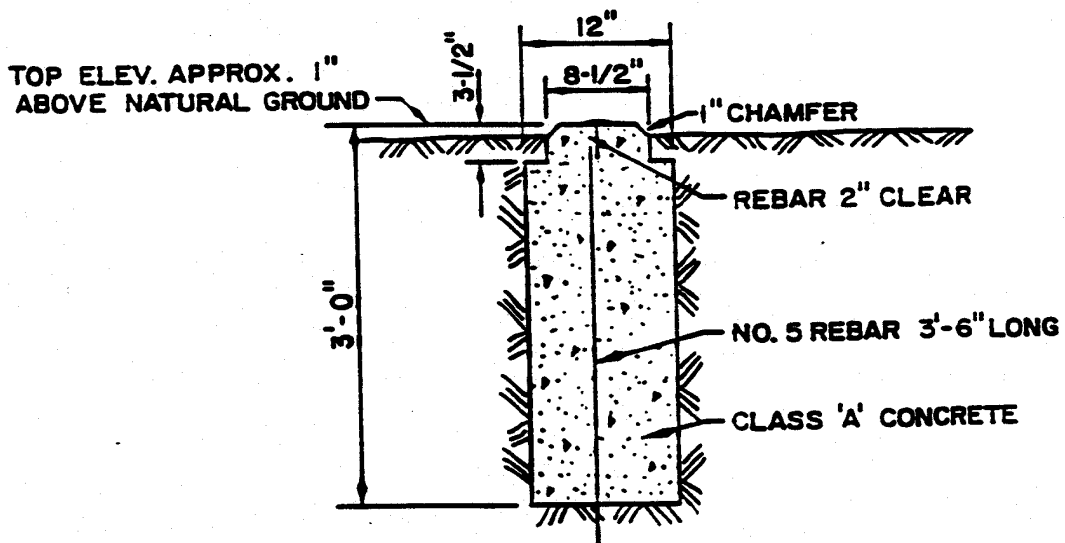
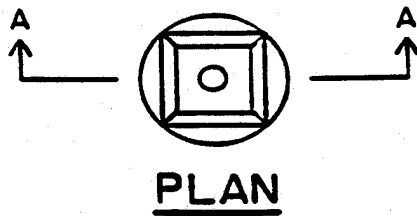
Non-compliance with specified tolerances shall result in replacement at the Contractor's expense. The properly furnished survey monument shall be neat in appearance with the exposed brass face free of cement mortar and constructed to an elevation of approximately one inch of finished grade. See Survey Monument detail on the last page of these specifications.

4. Measurement and Payment

Unless indicated otherwise in the Proposal, Survey Monument shall be measured as individual units for each monument placed. Payment at the unit price bid for "Survey Monument" shall constitute full compensation for all work, materials, equipment and incidentals required to install the Survey Monuments.



**DISC DETAIL**  
N.T.S.



**SECTION A-A**

**SURVEY MARKERS DETAIL**

3/4" = 1'-0"



SECTION 020200  
FIELD OFFICE

1. DESCRIPTION

This specification shall govern all work for providing a field office required completing the project.

2. REQUIREMENTS

The Contractor shall furnish the City with a field office at the construction site. The field office shall contain at least 120 square feet of useable space. The field office shall be air conditioned and heated and shall be furnished with an inclined table that measures at least 30" x 60" and two (2) chairs. The Contractor shall move the field office on the site as required by the Engineer. The field office shall be furnished with a telephone and a fax machine paid for by the Contractor.

3. MEASUREMENT AND PAYMENT

Unless included in the proposal as a bid item, all work and materials required for providing a field office shall not be measured for pay but will be considered subsidiary to other work.

SECTION 020400  
AUTOMATED STORMWATER SAMPLING SYSTEM

1. DESCRIPTION

This specification shall govern all equipment and software required for the installation of automated stormwater sampling systems for collecting stormwater samples in remote locations to meet EPA NPDES requirements for stormwater discharges to receiving waters of the United States.

2. EQUIPMENT CERTIFICATION

The contractor shall submit the manufacturer's certification and technical specification for each piece of equipment used in the stormwater sampling system stating that the equipment furnished meets or exceeds the specifications herein. Three copies of all submittals shall be made sufficiently in advance of site mobilization to allow inspection and confirmation. Improperly packaged or labeled materials shall be rejected and removed from the job site.

3. SAMPLING STATION

The stormwater sampling station shall consist of equipment for measuring flow and collecting storm water samples from conduits or open channels. The basic station shall consist of a programmable measurement and control module with telecommunications capability, a peristaltic pump, one or more bottles to collect the sample, a temperature measuring device and a rain gauge. Flow measurement shall be performed by an ultrasonic-Doppler flow meter in conjunction with a primary device or the Manning equation. Land-line network communications shall be used at the site. The components of the system shall be rated to NEMA-4X standards or installed in NEMA-4X enclosures. The system shall be enclosed in a vandal resistant lockable welded housing structure.

4. CONTROL STATION

Multiple stations shall be monitored and controlled remotely from an IBM-compatible PC with Storm Control software. Software shall be compatible with existing software on City equipment. The communication protocol used on this system shall be compatible with Campbell Scientific, Inc.'s proprietary PC 208 Software. Storm Control software shall provide the capability to initialize the remotely situated stations, monitor and control their operation and download recorded data. Campbell Scientific, Inc. software (PC208) is required as a minimum to address issues of compatibility.

5. MEASUREMENT AND CONTROL MODULE WITH WIRING PANEL

The measurement and control module shall be programmable controller with built-in data logging capability and facilities for exciting and measuring analog and digital sensors and devices. It shall have a 9-pin communication port which will be used to connect a hand-held console, or to connect remote communication facilities. The module shall be a precision instrument with an instruction set specifically selected for measuring environmental parameters. It shall have a set of eight digital ports which may be programmed as input or output channels to control the sensors or sense their condition. The electronic components shall be housed in an environmentally sealed canister. The canister shall fit into a wiring panel to facilitate field connections. Several levels of electrical transient protection shall be provided in the wiring panel and the electronics canister.

Specifications: Campbell CR10X or approved equal.

A. Input/output

Analog Inputs: 12 single-ended or 6 differential  
Digital Control/Status Ports: 8 programmable  
Pulse Inputs: 2  
Excitation Outputs: 3  
Switched 12 Volt Port: 1  
9-Pin Serial I/O Port: 1

- B. Analog Inputs:
  - Range: +/- 2.5, 7.5, 25, 250, 2500 millivolts, software selectable
  - Resolution: 0.33, 1.00, 3.33, 33.3, 333 respectively
  - Accuracy: 0.2% of FSR over -25 to +50 degrees C
  - 0.1% of FSR over 0 to +40 degrees C
  - Normal Mode Rejection: 70 dB
  - DC Common Mode Rejection: >140 dB
  - Input Resistance: 200 gigohms
- C. Excitation Outputs
  - Range: +/- 2500 millivolts
  - Resolution: 0.67 millivolts
  - Accuracy: Same as voltage input
- D. Digital Control/Status Ports
  - Output Voltages: High 5.0 +/- 0.1 V; Low, 0.1 V
  - Input State: High 3.0 to 5.5 V; Low -0.5 to +0.8 V
- E. Clock Accuracy: +/- 1 minute per month
- F. Memory: 32K ROM; 128K RAM
- G. System Power Requirements: 9.6 to 16 volts.

6. WATER SAMPLING EQUIPMENT

The water sampling equipment shall be ISCO 6700 sampler or approved equal and shall consist of a Controller/Pump assembly, a sample container, a base assembly which holds the sample container and a supply of ice, and a suction line. The Controller/Pump assembly shall consist of a peristaltic pump, a drive motor, a liquid detector, and control electronics housed in a NEMA-4X enclosure. Sample volumes shall be programmed by means of an integral control panel on the sampler. Sampling will be controlled in real-time by electrical signals to a control port. The sampler base shall be capable of holding a 19-liter glass sample container and a supply of ice.

The sample container shall be high quality borosilicate glass. The sample container closure shall be Teflon. With the exception of a short section of silicon hose in the peristaltic pump, the sample suction line shall be Teflon. Suction line shall be provided in continuous runs from each station enclosure to the intake structure in the water stream. All materials that come in contact with the water sample shall be constructed of Teflon, borosilicate glass, or stainless steel. Prior to installation in the water stream, all components shall undergo a rigorous cleaning protocol to remove the potential for contamination of trace metals and organic compounds.

A. Specifications:

Controller/Pump

Sample Volume Accuracy: +/- 10 ml or +/- 10% of programmed volume, whichever is greater  
 Sample Volume Repeatability: +/- 5 milli liters or +/- 5% of the average sample volume in a set, whichever is greater  
 Suction Lift: 28 Feet  
 Line Transport Velocity: 3.0 feet/second at 3 foot suction head  
 2.2 feet/second at 25 foot suction head  
 Enclosure: NEMA 4-X, 6

Sampler Housing, Bottle Container

Height: 35 inches maximum  
 Diameter: 19.96 inches  
 Capacity: 1-19 liter bottler with stopper

Sample Bottle

Capacity: 19 liters  
Material: Borosilicate  
Stopper: Solid PTFE with clamp mechanism for transportation  
Solid PTFE with 7/16 centered hole for sampling

Suction Line:

3/8 inch I.D. solid-wall FEP Teflon, with wall thickness of 0.063 +/- 0.006 inches.

B. Cleaning Protocol:

Prior to installation at a site to be sampled, all components that will come in contact with the sample shall be cleaned using appropriate methods to remove low-level organic and trace metal contaminants. This will include all bottles, bottle stoppers, Teflon and silicone tubing, and intake strainers. Cleaning shall be to levels equal to or below project detection limits.

After cleaning, but prior to installation, ten percent of all bottles and Teflon tubing shall have equipment blank analyses performed. The blanks shall be analyzed for the contaminants of concern to the Program. If the limits shown below are exceeded, the entire lot of bottles or tubing shall be recleaned and blanks will be reanalyzed. This process is required until documentation can be provided to the City that equipment blanks are free of all contaminants of concern at no additional pay.

Detection limits used for analysis:

One (1) part per million for Total Organic Compounds  
(TOC)  
One (1) part per billion for zinc, copper, and lead  
Two (2) parts per billion for nickel

7. Thermistor

A temperature sensor using a thermistor Campbell 107B or approved equal shall be housed in a waterproof enclosure with a cable attached. The unit shall be suitable for burial or immersion in water.

Specifications:

Accuracy: +/- 1.0 degrees C over -40 to +55 degrees C  
+/- 0.1 degrees C over -35 to +48 degrees C

8. SITE ENCLOSURE:

The site enclosure shall be a top-opening, lockable steel box of welded construction with louvers located on the front and sides for ventilation. It shall be designed to be vandal resistant with carriage bolts used to attach hinges and other components that are not welded. Two hasps shall be provided for padlocks. Protective covers shall be welded over the hasps to discourage cutting of the padlocks.

Specifications

Dimensions: 36 inches high x 42 inches wide x 30 inches deep  
with open bottom  
Material: 12 Gauge Steel  
Color: White paint applied over primer on both inside and  
outside  
Mounting: 2 inch wide internal base flange with 1/2 inch  
diameter holes  
Cooling: Ventilation is provided by hooded louvers located  
near the bottom of the enclosure on the front and  
back and near the top of the enclosure on each side.

## 9. FLOW MEASUREMENT:

An ultrasonic Doppler flow-measurement device ISCO 4150 or approved equal shall be used to measure the average particle velocity across the liquid stream. A pressure sensitive liquid level sensing device shall be incorporated into the transducer housing. The flow measuring device shall be capable of providing real-time velocity, depth, and battery voltage measurements upon command from the Measurement and Control Module with a RS 232 interface. The flow shall be calculated in the Measurement and Control Module from the average velocity and depth provided by the flowmeter and the channel geometry.

### Specifications:

Velocity Range:	-5 to 20 feet/second
Depth Range:	0.1 to 10 feet
Temperature Range:	
Logger/Controller:	-18 to 60 degrees C Operating
Probe:	0 to 71 degrees C Operating
	0 to 50 degrees C Compensated

## 10. COMMUNICATIONS:

Land-line communications shall be provided with a modem that interfaces with the Measurement and Control Module 9-pin serial port and a public land-line switched telephone network. The modem shall be capable of communication with a Hayes-compatible modem and an IBM-compatible PC.

### Specifications:

- A. Standards: Bell 212a, CCITT V.22
- B. Baud Rates: 300,1200
- C. Operation: Full-duplex over standard phone lines
- D. Operating temperature: -25 to +50 degrees C

## 11. REMOTE STORM CONTROL:

The Storm Control software shall be compatible with existing hardware and software which is owned by the City. The network of Sampling Stations will be monitored and controlled from an IBM-compatible PC equipped with a VGA monitor, appropriate modems, and Storm Control software. The Storm Control software shall provide menu selectable programs to allow an operator to remotely initialize operation, monitor and modify the operation of any of the Sampling Stations, and terminate the operation, all in real time. The software shall have the capability of retrieving logged data remotely from the station at a later time after the event is completed. Data retrieved from each of the station sites shall be stored sequentially in a data base for that site. The Storm Control software shall use the facilities of Campbell Scientific, Inc. PC208 Data Logger Support Software.

The PC208 Data Logger Support Software is a suite of programs that run on an IBM-compatible PC using the DOS Operating System. PC208 provides proprietary telecommunications protocols to communicate with the Campbell CR10X Data Logger both in real-time and in batch mode. It also has data editing and graphical display facilities.

## 12. RAIN GAUGE:

An electric tipping bucket rain gauge Texas Electronics 525 or approved equal shall be provided.

### Specifications

Resolution: 0.01 inches per tip

Accuracy: 1.0% at 2 inches/hour or less  
 Signal Output: Momentary unconditioned switch closure of 135 ms average duration.  
 Material: Body: Anodized aluminum  
 Receiving Orifice: Gold anodized spun aluminum knife edge collector ring.  
 Environmental: 0 to +50 degrees C  
 0 to 100% humidity  
 Cable: 2-conductor shielded with plastic cover, length is customized to site requirements.

13. SOLAR PANEL:

A solar electric panel shall be provided.

Specifications

Rated Power:	20.0 Watts
Current (typical at load)	1.38 Amps
Voltage (typical at load)	14.5 Volts
Short Circuit Current (typical)	1.60 Amps
Open Circuit Voltage (typical)	18.0 Volts
Module Leakage Current	<50 uA at 3000 VDC electrical voltage isolation
Normal Operating Cell Temp.	42°C +/- 2°C
Environment	-40°C to 90°C, 0 to 85% humidity
Materials	Layered with ethylene vinyl acetate (EVA)

14. SOLAR PANEL REGULATOR:

A solar panel regulator shall be provided.

Specifications

Input Voltage Max	60 VDC VOC
Input Voltage Min	15.0 VDC
Input Current Max	10 A
Charge Stop Voltage	14.35 VDC
Current Consumption	55 mA
Operating Temperature	-40 degrees C to +65 degrees C
Operating Humidity	up to 100%
Encapsulation	Fully Potted with Polymer Resin
Packaging	Injection molded, impact and UV resistant, ABS plastic enclosure



A suitable well screen and well casing is TriLoc available through:

Brainard-Kilman  
P. O. Box 1959  
Stone Mountain, Georgia 30086  
(404) 469-2720

Other suppliers manufacturing a similar product meeting the specification as stated will be considered provided that the Contractor furnishes to the City complete manufacturer's technical specifications and certifications.

3. Filter Pack materials shall be silica sand which is commercially manufactured, washed clean, chemically inert, organic free and packaged and clearly labeled by the supplier. The silica sand must carry the manufacturer's guarantee of being not less than 95% pure silica dioxide. The gradation shall be "16-30" with 98 to 100% passing the #16 sieve and retained on the #30 sieve. This product is manufactured by:

Colorado Silica Sand, Inc.  
P. O. Box 15615  
Colorado Springs, CO 80935  
(303) 390-7969

Other suppliers manufacturing a similar product meeting the above specification will be considered provided that the Contractor furnishes to the City complete manufacturer's technical specifications and certifications.

4. Bentonite Seal shall be placed on top of the filter pack to a minimum thickness of 2 feet. The bentonite seal shall be 1/4 or 3/8 inch sodium bentonite pellets. The Contractor shall measure to the top of the filter pack and then to the top of the bentonite seal to verify the thickness and to insure that bridging has not occurred and that the seal is uniformly distributed around the casing. Clean water shall be added to initiate hydration, and placement of the casing seal shall be delayed until the pellets have swelled and sealed, a minimum time of one hour.
5. Centralizers shall be stainless steel, expandable to 12 inches and manufactured to hold the 4-inch pipe near the center of the hole while allowing backfill materials to pass by the device. A centralizer shall be placed near the bottom of the hole and at the top of the sand filter pack.
6. Any and all water used to aid drilling, for mixing grout or any other purpose, shall be clean, potable water from the City of Corpus Christi water distribution system. It shall be delivered to the site in trucks whose tanks have been thoroughly cleaned.
7. Casing Seal shall consist of a flowable, workable mixture of water and commercial bentonite, equal to VolClay Grout as manufactured by American Colloid Company (312-392-4600) and specifically intended for monitor well usage. The bentonite shall be a high solid powdered sodium bentonite furnished in bags and clearly labelled and identified on each bag. Cement shall not be added to the casing seal grout.

The bentonite/water grout shall be thoroughly mixed with a mechanical mixer or by circulating the mix through a Moyno pump until all lumps are removed. The quantity of mixing water shall be according to the manufacturer's recommendations.

8. Concrete Surface Seal shall be constructed to the configuration as indicated on the Monitor Well Data Sheet. Concrete shall be supplied and placed in



accordance with Section 030020, Section 038000 and reinforcing steel as per Section 032020. The steel protective well pipe collar should be set at least 1 foot into this concrete seal.

9. Protective Seal Well Pipe Collar shall be 10-inch I.D. diameter and constructed using Schedule 40 Galvanized Steel. It shall be constructed with a sturdy, hinged top and locking mechanism.
10. Dedicated Bailer shall be a commercially available Schedule 40 PVC plastic bailer of 2-inch I.D. and 5 ft. length. The bailer shall be manufactured with a removable check valve to facilitate cleaning and with a stainless steel hanger for securing the bailer by a cord, 60 lb. nylon monofilament, to the inside of the well casing. The specific method of attaching the bailer to the well shall be approved by the City inspector.

The Contractor shall furnish to the City a representative sample of the well casing, well screen, filter pack sand, bentonite seal and casing seal. These materials will be maintained by the City for future reference.

### 3. DECONTAMINATION OF EQUIPMENT

1. The drill rig, water truck and other vehicles and equipment shall be in good operable condition and free of any hydraulic fluid, brake oil or lubricating oil leaks which may contaminate the well site. Leaking tanks containing fluids other than potable water shall not be allowed.
2. All equipment and tools shall be thoroughly cleaned using a steam cleaner or hot water washer prior to arriving at the work site and before starting each new monitor well. Entry onto the site shall not be allowed until approved by the Engineer.
3. New painted bits and tools, which may leave paint chips in the hole, shall not be used.
4. All water tanks, pumps, hoses and mud tubs shall be cleaned and flushed with potable water.
5. Precautions shall be taken to prevent contamination of the well with oil and grease. Lubricants shall not be used on the drilling tools or fittings.
6. Clean work gloves shall be used by the work crew.
7. All bailers, pumps or other apparatus used for developing the completed well shall be cleaned and approved by the Engineer.
8. All materials used in constructing the monitor wells shall be free of contaminants.

### 4. DRILLING PROCEDURES

The Contractor shall create a stable, open, vertical well hole and install the various equipment/materials in the hole to form a monitor well suitable for sampling groundwater. Any hole which must be abandoned due to failure of the Contractor to properly construct the monitor well in accordance with this specification shall be grouted according to the TNRCC rules and the Texas Water Well Drillers Act governing plugging and completion of wells, and at no cost to the City.

1. The drill equipment, tools and methods for advancing the holes are at the Contractor's discretion provided that the method in no way contaminates the water bearing zone, disrupts the inflow characteristics or creates an unstable

borehole in which the monitor well can not be properly installed and be expected to produce representative formation water.

2. Drilling muds shall not be used in advancing the hole. Clean potable City water may be used as a drilling fluid provided that no additives are used, and provided that the tub is emptied of used water and drill cuttings, cleaned and fresh water used to advance the hole below the 20 foot depth in the water-bearing zone. Upon reaching the completion depth, fresh water shall be used to flush all cuttings from the hole without recirculation.
3. Compressed air may be used as a circulating medium to remove cuttings from the hole provided that the Contractor can assure to the City's satisfaction that the air compressor is properly equipped with air filters and/or other devices capable of removing lubricating oils or other hydrocarbons in the compressed air. These filters must be inspected daily and cleaned and replaced when contaminated.
4. The Contractor shall maintain a well log from cuttings noting that soil type, changes in strata, occurrence of water bearing layers, and any other information required for completion of the well log and submittal to the TNRCC.
5. The Contractor shall calculate the quantity of filter pack to fill the annulus between the well screen and hole and maintain a record of actual quantity installed, and justify to the Engineer any deviations in actual quantities with calculated values. The Contractor may during introduction of the filter pack sand introduce clean water to aid the compaction of the sand around the screen. Measurements should be made down the annulus area to ascertain that the filter pack is completely filling the annulus without cave-in of the natural soil against the screen.
6. The casing seal grout shall be introduced by pumping through a suitable hole/pipe to the top of the bentonite seal and the grout shall be allowed to flow upward along the well casing to the surface. The grout shall not be distributed for at least 24 hours to allow the grout to settle in and set.
7. The concrete surface pad shall be constructed to the dimensions as shown on the Monitor Well Data Sheet. The top of the pad shall be sufficiently above the ground surface such that a slope can be constructed to direct surface water away from the well casing. Topsoil shall be placed and compacted adjacent to the pad.
8. The Contractor shall remove all construction debris from the site and repair any ruts and holes created by his operations.

#### 5. WELL DEVELOPMENT AND ACCEPTANCE

Each well shall be developed until representative formation water free of the effects of well construction is obtained. The purging and well development and acceptance criteria are described below:

1. Pumps, bailers and other well development tools shall meet the following criteria and shall be decontaminated prior to use.
  - a) Submersible pumps shall include electric motor powered centrifugal or positive displacement type pumps, which are operated under submergence. If a submersible pump is utilized for well development, it shall be of a type and capacity such that it can pump water from the well continuously for a period of at least five minutes without shutting off. Backpressure

or other methods may be utilized to accomplish the desired rate of pumping. The pump shall be capable of being turned on and off instantaneously to create surges in the well. The pump shall be fitted with a check valve.

- b) A Bladder or diaphragm pump is a type of pump, which operates under the cycling of compressed air. The compressed air cycling inflates and deflates a diaphragm, which creates a pumping action. Bladder pumps approved for well development shall be capable of pumping at least 3 gpm continuously when installed in the well.
  - c) A jet pump utilizes the Venturi principle to create subatmospheric pressure, which allows a suction pump to be utilized below a depth at which suction alone would not normally lift the water. Jet pumps approved for well development shall be capable of pumping at least 3 gpm continuously when installed in the well.
  - d) Suction pumps shall not be utilized in wells the depth of which exceeds 25 feet. Suction pumps used to develop wells less than 25 feet deep shall be capable of pumping at least 5 gpm continuously without pumping the well dry in less than five minutes.
  - e) Bailers shall not be utilized for well development except after an approved submersible, bladder, jet or suction pump has been installed in the well or compressed air or bottled nitrogen has been used, and the rate of well recovery is so slow that these methods are ineffective.
  - f) Compressed air supplied by an engine-drive compressor equipped with an approved oil trap may be utilized provided the source of compressed air is capable of evacuating 50 percent of the column of water from the well once every minute.
  - g) Bottled nitrogen may be utilized provided an oil trap and regulator is employed and the system is capable of evacuating 50 percent of the column water from the well once every minute.
2. Representative formation water shall be assumed to have been obtained when the pH, temperature and conductivity readings are stable and the water is clean as evidenced by a turbidity reading of 5 or less. Testing of pH, temperature and conductivity shall be performed by the Contractor and all readings shall be recorded noting the date and time of each reading. When the Contractor has obtained stable readings, a final sample will be drawn by the Contractor for turbidity testing by the City. At least one well volume must be removed between readings, and at least three consecutive stable readings must be obtained to complete the well development.

For this determination, a well volume will be considered the volume of water within the well casing and filter pack zone after the water level has stabilized in the well. If the water level inflow is so slow that stabilization has not occurred within 24 hours, the Engineer may, at his discretion, alter the well volume requirement to the quantity of water collected in the well for a 24-hour period.

3. The well will be accepted by the City when well development has been completed as described herein, and when all documentation including records of well developments tests (pH, temperature and conductivity) have been submitted and approved by the Engineer. The Monitor Well Data Sheets and Information Sheets will be completed by the City. It shall be the Contractor's responsibility as licensed Texas Water Well Driller to complete and submit all "well logs" and any other required forms to the TNRCC, and provide a copy to the Engineer.

SECTION 021010  
PROJECT SIGNS

1. DESCRIPTION

This specification shall govern all work for providing project signs required to complete the project.

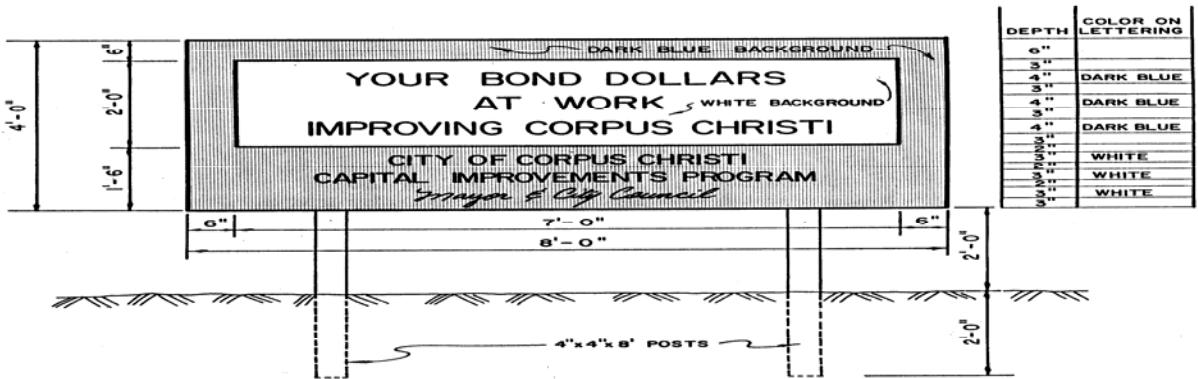
2. REQUIREMENTS

The Contractor shall furnish and install two project signs as shown on the following page. The signs shall be installed prior to construction and be maintained throughout the project. The location of the signs shall be subject to approval of the Engineer and shall not obstruct visibility of any motorist.

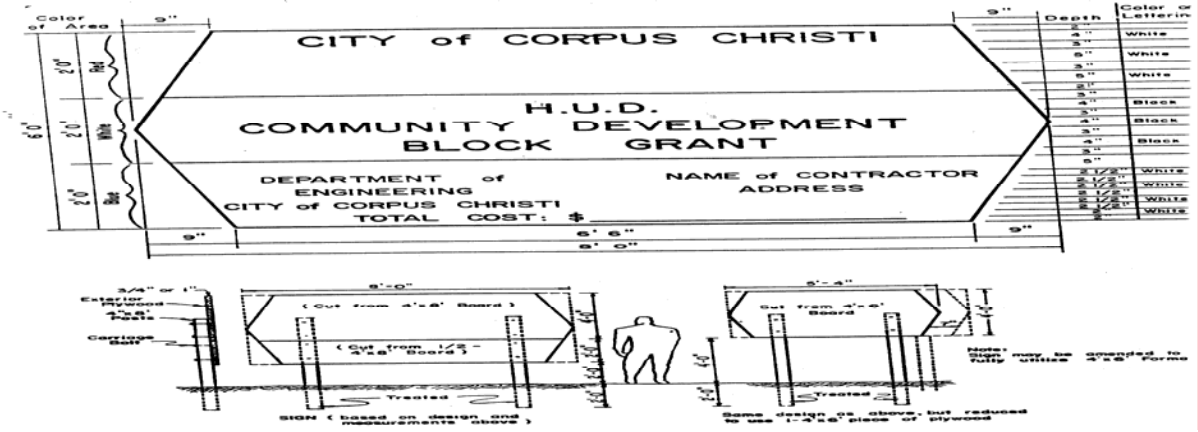
3. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, all work and materials required for providing project signs shall not be measured for pay but will be considered subsidiary to other work.

SIGNS FOR BOND PROJECTS:



SIGNS FOR CDBG AND HUD PROJECTS:



SECTION 021020  
SITE CLEARING AND STRIPPING (S-5)

1. DESCRIPTION

This specification shall govern all work necessary for clearing, grubbing, and stripping of objectionable matter as required to complete the project and shall include removing and disposing of trees, stumps, brush, roots, vegetation, rubbish and other objectionable matter from the project site.

2. CONSTRUCTION METHODS

The site shall be cleared of all trees, stumps, brush, roots, vegetation, rubble and other objectionable matter as indicated on drawings and/or as directed by the Engineer. Tree stumps and roots shall be grubbed to a minimum depth of 2 feet below natural ground. Areas, which underlie compacted backfill, shall be stripped of all vegetation, humus and other objectionable matter encountered within the top 6" of the soil. All material removed from site under this operation shall become the Contractor's responsibility. The material shall be disposed of either at a disposal site indicated on the drawings or at a site obtained by the Contractor.

3. MEASUREMENT & PAYMENT

Unless indicated otherwise in the Proposal, site clearing shall be measured by the acre. The payment shall include but not be limited to the removing and disposing of objectionable matter from site as indicated above.

021020  
1/18/01

SECTION 021040  
SITE GRADING (S-6)

1. DESCRIPTION

This specification shall govern all work necessary for backfill and grading of the site to complete the project.

2. CONSTRUCTION METHODS

Prior to site grading, the site shall be cleared in accordance with Standard Specification Section 021020 (Site Clearing and Stripping). Unless specified otherwise on drawings, the existing surface shall be loosened by scarifying or plowing to a depth of not less than 6 inches. The loosened material shall be recompacted with fill.

Fill shall be uniform as to material, density, and moisture content. Fill shall be free of large clods, large rocks, organic matter, and other objectionable material. No fill, that is placed by dumping in a pile or windrow, shall be incorporated into a layer in that position; all such piles and windrows shall be moved by blading or similar method. All fill shall be placed in layers approximately parallel to the finish grade and in layers not in excess of 6 inches of uncompacted depth, unless indicated otherwise on drawings.

The fill shall be compacted to a density which approximates that of natural ground unless indicated otherwise on drawings.

The Engineer may order test rolling to evaluate the uniformity of compaction. All irregularities, depressions, and soft spots which develop shall be corrected by the Contractor.

Excess material from excavation, that is not incorporated into the site as fill, shall become property of the Contractor and disposed of away from the job site, unless indicated otherwise on the drawings.

3. MEASUREMENT & PAYMENT

Unless indicated otherwise in the Proposal, Site Grading shall be measured by the horizontal square yard. This item shall include, but not be limited to, supplying, placing, and compacting of fill material; and removing and disposing of excess material.

SECTION 021080  
REMOVING OLD STRUCTURES (S-55)

1. DESCRIPTION

This specification shall provide for the removal and disposal of old structures or portions of old structures, as noted on the plans, and shall include all excavation and backfilling necessary to complete the removal. The work shall be done in accordance with the provisions of these specifications.

2. METHOD OF REMOVAL

Culverts or Sewers. Pipe shall be removed by careful excavation of all dirt on top and the sides in such manner that the pipe will not be damaged. Removal of sewer appurtenances shall be included for removal with the pipe. Those pipes, which are deemed unsatisfactory for reuse by the Engineer, may be removed in any manner the Contractor may select.

Concrete Structures. Unwanted Concrete structures or concrete portions of structures shall be removed. The unwanted structure shall be removed to the lines and dimensions shown on the plans, and these materials shall be disposed of as shown on the plans or as directed by the Engineer. Any portion of the existing structure, outside of the limits designated for removal, damaged during the operations of the Contractor shall be restored to its original condition at his entire expense. Explosives shall not be used in the removal of portions of the existing structure unless approved by the Engineer, in writing.

Concrete portions of structures below the permanent ground line, which will not interfere in any manner with the proposed construction, may be left in place, but removal shall be carried at least 5 feet below the permanent ground line and neatly squared off. Reinforcement shall be cut off close to the concrete. Backfill and compact in one-foot lifts and to a minimum of 95% Standard Proctor.

Steel Structures. Steel structures or steel portions of structures shall be dismantled in sections as determined by the Engineer. The sections shall be stored, if the members are to be reused. Rivets and bolts connecting steel railing members, steel beams of beam spans and steel stringers of truss spans shall be removed by butting the heads with a "cold cut" and punching or drilling from the hole, or by such other method as will not injure the members for re-use and will meet the approval of the Engineer. The removal of rivets and bolts from connections of truss members, bracing members, and other similar members in the structure will not be required unless specifically called for on the plans or special provisions and the Contractor shall have the option of dismantling these members by flame-cutting the members immediately adjacent to the connections. Flame Cutting will not be permitted, however, when plans or special provisions call for the structure unit to be salvaged in such manner as to permit re-erection. In such case, all members shall be carefully matchmarked with paint in accordance with diagram furnished by the Engineer prior to dismantling and all rivets and bolts shall be removed from the connections in the manner specified in the first portion of this paragraph.

Timber Structures Timber structures or timber portions of structures to be reused shall be removed in such manner as to damage the timber for further use as little as possible. All bolts and nails shall be removed from such lumber as deemed salvable by the Engineer.

Unless otherwise specified on the plans, timber piles shall be either pulled or cut off at the point not less than 2 feet below ground line, with the choice between these two methods resting with the Contractor, unless otherwise

specified.

Brick or Stone Structures. Unwanted brick or stone structures or stone portions of structures shall be removed. Portions of such structures below the permanent ground line, which will not in any manner interfere with the proposed construction, may be left in place, but removal shall be carried at least 5 feet below the permanent ground line and neatly squared off. Backfill and compact in one-foot lifts and to a minimum of 95% Standard Proctor.

Salvage. All material such as pipe, timbers, railings, etc., which the Engineer deems as salvable for reuse, and all salvaged structural steel shall be delivered to a designated storage area.

The I-beams, stringers, etc., which are specified to be dismantled without damage for reuse, and all steel members when matchmarked and dismantled for reuse, shall be blocked off the ground in an upright position to protect the members against further damage.

Materials, other than structural steel, which are not deemed salvable by the Engineer, shall become the property of the Contractor and shall be removed to suitable disposal sites off of the right-of-way arranged for by the Contractor, or otherwise disposed of in a manner satisfactory to the Engineer.

Where temporary structures are necessary for a detour adjacent to the present structure, the Contractor will be permitted to use the material in the old structure for the detour structure, but he shall dismantle and stack or dispose of the material as required above as soon as the new structure is opened for traffic.

Backfill. All excavation made in connection with this specification and all openings below the natural ground line caused by the removal of old structures or portions thereof shall be backfilled to the level of the original ground line, unless otherwise provided on the plans.

That portion of the backfill, which will support any portion of the roadbed or embankment, shall be placed in layers of the same depth as those required for placing embankment. Material in each layer shall be wetted uniformly, if required, and shall be compacted to a minimum of 95% Standard Proctor. In places inaccessible to blading and rolling equipment, mechanical or hand tamps or rammers shall be used to obtain the required compaction.

That portion of the backfill which will not support any portion of the roadbed or embankment shall be placed as directed by the Engineer in such manner and to such state of compaction as will preclude objectionable amount of settlement.

### 3. MEASUREMENT & PAYMENT

Unless indicated otherwise in the Proposal, this work shall not be measured for pay but shall be subsidiary to the project.



SECTION 022020  
EXCAVATION AND BACKFILL FOR UTILITIES AND SEWERS (S-9)

1. DESCRIPTION

This specification shall govern all work for excavation and backfill for utilities and sewers required to complete the project.

2. CONSTRUCTION

- (1) Unless otherwise specified on the plans or permitted by the Engineer, all sewers, pipe, and conduit shall be constructed in open cut trenches with vertical sides. Trenches shall be sheathed and braced as necessary throughout the construction period. Sheathing and bracing shall be the responsibility of the Contractor (Section 022022).

Trenches shall have a maximum width of one foot beyond the horizontal projection of the outside surfaces of the pipe and parallel thereto on each side unless otherwise specified.

The Contractor shall not have more the 200 feet of open trench left behind the trenching operation and no more then 500 feet of ditch behind the ditching machine that is not compacted as required by the plans and specification. No trench or excavation shall remain open after working hours.

For all utility conduit and sewer pipe to be constructed in fill above natural ground, the embankment shall first be constructed to an elevation not less than one foot above the top of the pipe or conduit after which excavation for the pipe or conduit shall be made.

If quicksand, muck, or similar unstable material develop or is encountered during the excavation, the following procedure shall be used unless other methods are called for on the plans. If the unstable condition is a result of ground water, the Contractor, prior to additional excavation shall control it. After stable conditions have been achieved, unstable soil shall be removed or stabilized to a depth of 2 feet below the bottom of pipe for pipes 2 feet or more in height; and to a depth equal to the height of pipe, 6 inch minimum, for pipe less then 2 feet in height. Such excavation shall be carried at least 1 foot beyond the horizontal limits of the structure on all sides. All unstable soil so removed shall be replaced with suitable stable material, placed in uniform layers of suitable depth as directed by the Engineer, and each layer shall be wetted, if necessary, and compacted by mechanical tamping as required to provide a stable condition. For unstable trench conditions requiring outside forms, seals, sheathing, and bracing, any additional excavation and backfill required shall be done at the contractor's expense.

- (2) Shaping of Trench Bottom. The trench bottom shall be undercut a minimum depth sufficient to accommodate the class of bedding indicated in the plans and specification.
- (3) Dewatering Trench. Pipe or conduit shall not constructed or laid in a trench in the presence of water. All water shall be removed from the trench sufficiently prior to the pipe or conduit planing operation insure a relatively dry (no standing water), firm bed. The trench shall be maintained in such dewatered condition until the trench has been backfilled to a height at lease one-foot above the top of pipe. Removal of water may be accomplished by bailing, pumping, or by a well-points

installation as conditions warrant. Removal of well-points shall be at rate of 1/3 per 24 hours (every third well-point).

- (4) Excavation in Streets. Excavation in streets, together with the maintenance of traffic where specified, and the restoration of the pavement riding surface shall be in accordance with plan detail, or as required by other applicable specifications.
- (5) Removing Old Structures. When old masonry structures or foundations are encountered in the excavation, such obstructions shall be removed for the full width of the trench and to a depth of 1-foot below the bottom of the trench. When old inlets or manholes are encountered and no plan provision is made for adjustment or connection to the new utility, such manholes and inlets shall be removed completely to a depth 1-foot below the bottom of the trench. In each instance, the bottom to the trench shall be restored to grade by backfilling and compacting by the methods provided hereinafter for backfill. Where the trench cuts through storm or sanitary sewers which are known to be abandoned, these sewers shall be cut flush with sides of the trench and blocked with a concrete plug in a manner satisfactory to the Engineer.
- (6) Protection of Utilities. The Contractor shall conduct his work such that a reasonable minimum of disturbance to existing utilities will result. Particular care shall be exercised to avoid the cutting or breakage of water and gas lines. Such lines, if broken, shall be restored promptly by the Contractor. When active sanitary sewer lines are cut in the trenching operations, temporary flumes shall be provided across the trench, while open, and the lines shall be restored when the backfilling has progressed to the original bedding lines of the sewer so cut.

The Contractor shall inform utility owners sufficiently in advance of the Contractor's operations to enable such utility owners to reroute, provide temporary detours, or to make other adjustments to utility lines in order that the Contractor may proceed with his work with a minimum of delay. The Contractor shall not hold the City liable for any expense due to delay or additional work because of utility adjustments or conflicts.

- (7) Excess Excavated Material. All materials from excavation not required for backfilling the trench shall be removed, by the Contractor, from the job site promptly following the completion of work involved.
- (8) Backfill

A. Backfill Procedure Around Pipe

All trenches and excavation shall be backfilled as soon as is practical after the pipes or conduits are properly laid. In addition to the specified pipe bedding material, the backfill around the pipe as applicable, shall be select material as described by Standard Specification 022100 "Select Material", free of large hard lumps, or other debris. The backfill shall be deposited in the trench simultaneously on both sides of the pipe for the full width of the trench, in layers not to exceed six (6) inches (loose measurement), wetted if required to obtain proper compaction, and thoroughly compacted by mechanical tampers. A thoroughly compacted material shall be in place between the external wall of the pipe and the undisturbed sides of the trench and to a level twelve (12) inches above the top of the pipe.

B. Backfill Over One Foot Above Pipe

The backfill for that portion of trench over (1) foot above the pipe or conduit shall be selected excavated material free of hard lumps, rock fragments, or other debris, placed in layers not more than 6 inches in depth (loose measurement), wetted if required and thoroughly compacted by use of mechanical tampers to the natural bank density and not less than 95% Std. Proctor. Flooding of backfill is not allowed. Jetting of backfill will be allowed in sandy soils and in soils otherwise approved by the Engineer. Regardless of backfill method, no lift shall exceed one foot and density shall not be less than 95% Std. Proctor.

A period of not less than twenty-four (24) hours shall lapse between the time of jetting and the placing of the top four (4) feet of backfill.

When indicated on the plans or at utility line crossings that are under pavements, trenches shall be backfilled to the road base with "Hasty Backfill" cement-stabilized sand containing a minimum of 10 sacks of standard Type I Portland cement per cubic yard of sand.

### 3. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, Excavation and backfill for utilities and sewers shall not be measured and paid for separately. It shall be considered subsidiary to the items for which the excavation is required.

SECTION 022022  
TRENCH SAFETY FOR EXCAVATIONS

1. DESCRIPTION

This specification shall govern all work for providing for worker safety in excavations and trenching operations required to complete the project.

2. REQUIREMENTS

Worker Safety in excavations and trenches shall be provided by the Contractor in accordance with Occupational Safety and Health Administration (OSHA) Standards, 29 CFR Part 1926 Subpart P - Excavations.

It is the sole responsibility of the Contractor, and not the City or Engineer, to determine and monitor the specific applicability of a safety system to the field conditions to be encountered on the job site during the project.

The Contractor shall indemnify and hold harmless the City and Engineer from all damages and cost that may result from failure of methods or equipment used by the Contractor to provide for worker safety.

Trenches as used herein, shall apply to any excavation into which structures, utilities, or sewers are placed regardless of depth.

Trench Safety Plan as used herein, shall apply to all methods and materials used to provide for worker safety in excavation and trenching operations required during the project.

3. MEASUREMENT AND PAYMENT

Measurement of Trench Safety shall be by the linear foot of trench, regardless of depth. Measurement shall be taken along the centerline of the trench.

Measurement for Excavation Safety for Utility Structures shall be per each excavation. Excavations include, but are not limited to, those for manholes, vaults, pits and other such structures that are incidental to utility work.

Measurement for Excavation Safety for Special Structures shall be by as a lump sum for each special structure identified in the proposal.

Payment shall be at the unit price bid and shall fully compensate the Contractor for all work, equipment, materials, personnel, and incidentals as required to provide for worker safety in trenches and excavations for the project.

Revision current for Texas Code Chapter 756 Subchapter C. Trench Safety

SECTION 022040  
STREET EXCAVATION (S-10)

1. DESCRIPTION

This specification shall govern all work for Street Excavation required to complete the project.

2. CONSTRUCTION METHODS

(A) Stripping and Excavation

Strip the top 6" in all areas to underlay compacted fill, curbs, base or pavement, by removing all humus, vegetation and other unsuitable materials. Unless otherwise noted, remove existing trees, shrubs, fences, curb, gutter, sidewalk, drives, paving, pipe and structures within the graded area which interfere with new construction of finished grading.

All suitable excavated materials shall be utilized, insofar as practicable, in constructing the required roadway sections or in uniformly widening embankments, flattening slopes, etc., as directed by the Engineer. Unwanted roadway excavation and roadway excavation in excess of that needed for construction shall become the property of the Contractor to be disposed of by him outside the limits of the right-of-way at a location suitable to the Engineer. "Unsuitable" material encountered below subgrade elevation in roadway cuts, when declared unwanted by the Engineer, shall be replaced as directed by the Engineer with material from the roadway excavation or with other suitable material.

Maintain moisture and density until covered by the subbase or base. Remove soft or wet areas found at any time, replace with suitable material, and recompact (esp. utility trenches).

(B) Subgrade Preparation

That area shown on the plans for street construction shall be cut to grade, scarified to a depth not less than 6" and compacted to 95% standard proctor density. Irregularities exceeding 1" in 16' shall be corrected. Soft areas found at anytime shall be removed, replaced with acceptable material and compacted (esp. at utility trenches). The correct moisture density relationship shall be maintained.

(c) Curb Backfill and Topsoil (Sidewalks, Parkways, Island, etc.)

Fill and compact areas behind curbs and adjacent to sidewalks and driveways without delay after completion of concrete work. The top 6" (where disturbed by construction or where unsatisfactory material is exposed by excavation) of finished earth grade shall be clean excavated material or topsoil capable of supporting a good growth of grass when fertilized and seeded or sodded. It shall be free of concrete, asphalt, shell, caliche, debris and any other material, which detracts from its appearance or hampers the growth of grass.

(D) Matching Grades at Right-of-Way Line

Finished grade at the property line shall be as shown on the plans. The Engineer may require a reasonable amount of filling on private property where

the sidewalk grade is above the property elevation. Use suitable material from the excavation. Unless otherwise directed, cuts at right-of-way lines shall be made at a slope of 3:1.

(E) Drainage

During construction, the roadbed and ditches shall be maintained in such condition as to insure proper drainage at all times, and ditches and channels shall be so constructed and maintained as to avoid damage to the roadway section.

All slopes that, in the judgment of the Engineer, require variation shall be accurately shaped, and care shall be taken that no material is loosened below the required slopes. All breakage and slides shall be removed and disposed of as directed.

3. SELECTION OF MATERIALS

Where shown on plans, selected materials shall be utilized to improve the roadbed, in which case the work shall be performed in such manner and sequence that suitable materials may be selected, removed separately, and deposited in the roadway within limits and at elevations required.

4. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, Street excavation shall be measured and paid for by the square yard to the limits shown on the plans including excavation for street transition. Payment shall be full compensation for furnishing all materials, tools, equipment, and incidentals necessary to complete the work.

All work required for disposing of waste, including hauling, will not be paid for directly but shall be considered subsidiary to the various contract items.

SECTION 022060  
CHANNEL EXCAVATION (S-11)

1. DESCRIPTION

This specification shall govern all work for Channel Excavation required to complete the project.

2. CONSTRUCTION METHODS

Excavated slopes shall be finished in conformance with the lines and grades established by the Engineer. When completed, the average plane of slopes shall conform to the slopes indicated on the plans and no point on completed slopes shall vary from the designated slopes by more than 0.5 foot measured at right angles to the slope, unless otherwise specified. In no case shall any portion of the slope encroach on the roadbed. The tops of excavated slopes and the end of excavation shall be rounded as shown on the plans.

All suitable materials removed from the excavation shall be used, insofar as practicable, in the formation of embankments in accordance with the specification, Section 022080 "Embankment", or shall be otherwise utilized or satisfactorily disposed of as indicated on plans, or as directed, and completed work shall conform to the established alignment, grades and cross sections. During construction, the channel shall be kept drained, insofar as practicable, and the work shall be prosecuted in a neat workmanlike manner.

Unwanted channel excavation in excess of that needed for construction shall become the property of the Contractor and removed from the site and properly disposed.

3. SELECTION OF MATERIALS

Where shown on plans, selected materials shall be utilized in the formation of embankment or to improve the roadbed, in which case the work shall be performed in such manner and sequence that suitable materials may be selected, removed separately and deposited in the roadway within limits and at elevations required.

4. MEASUREMENT & PAYMENT

Unless indicated otherwise in the Proposal, channel excavation shall be measured in its original position and the volume computed in cubic yards by the method of average end areas or by linear foot of channel as specified. Channel excavation shall include, but not be limited to, excavation, hauling, and disposal.

SECTION 022080  
EMBANKMENT (S-13)

1. DESCRIPTION

This specification shall govern all work for embankment required to complete the project.

2. CONSTRUCTION METHODS

Prior to placing embankment the area to be covered shall be stripped of all vegetation and the material so removed shall be disposed of off the job site. Washes, gulleys, wet areas, and yielding areas shall be corrected as directed by the Engineer.

Unless otherwise indicated on plans the surface of the ground which is to receive embankment shall be loosened by scarifying or plowing to depth of not less than 6 inches. The loosened material shall be recompacted with the new embankment as hereinafter specified. Embankment shall be placed in layers not to exceed six inches uncompacted depth and the full width of the embankment, unless otherwise noted.

Where embankment is adjacent to a hillside or old roadbed, the existing slope shall be cut in steps to not less than the vertical depth of an uncompacted layer (6"). The fill material shall be placed from the low side and compacted. Each layer shall overlap the existing embankment by at least the width indicated by the embankment slope.

Trees, stumps, roots, vegetation or other unsuitable materials shall not be placed in embankment.

Each layer of embankment shall be uniform as to material, density and moisture content before beginning compaction. Where layers of unlike materials abut each other, each layer shall be featheredged for at least 100 feet or the material shall be so mixed as to prevent abrupt changes in the soil. No material placed in the embankment by dumping in a pile or windrow shall be incorporated in a layer in that position, but all such piles or windrows shall be moved by blading or similar methods. Clods or lumps of material shall be broken and the embankment material mixed by blading, harrowing, disking or similar methods to the end that a uniform material of uniform density is secured in each layer.

Except as otherwise required by the plans, all embankments shall be constructed in layers approximately parallel to the finished grade and each layer shall be so constructed as to provide a uniform slope of 1/4 inch per foot from the centerline of the embankment to the outside.

Each layer shall be compacted to the required density by any method, type and size of equipment which will give the required compaction. Prior to and in conjunction with the rolling operation, each layer shall be brought to the moisture content necessary to obtain the required density and shall be kept leveled with suitable equipment to insure uniform compaction over the entire layer.

For each layer of earth embankment and select material, it is the intent of this specification to provide the density as required herein, unless otherwise shown on the plans. Swelling soils (soils with plasticity index of 20 or more) shall be sprinkled as required to provide not less than optimum moisture and compacted to the extent necessary to provide not less than 95% Standard



Proctor, AASHTO T99. Non-swelling soils (soils with plasticity index less than 20) shall be sprinkled as required and compacted to the extent necessary to provide not less than 95% Standard Proctor. Field density determinations will be made in accordance with approved methods.

After each layer of earth embankment or select material is complete, tests as necessary will be made by the Engineer. If the material fails to meet the density specified, the course shall be reworked as necessary to obtain the specified compaction, and the compaction method shall be altered on subsequent work to obtain specified density. Such procedure shall be determined by, and subject to, the approval of the Engineer.

The Engineer may order proof rolling to test the uniformity of compaction of the embankment layers. All irregularities, depressions, weak or soft spots which develop shall be corrected immediately by the Contractor.

Should the subgrade, due to any reason or cause, lose the required stability, density or moisture, before the pavement structure is placed, it shall be recompacted and refinished at the sole expense of the Contractor. Excessive loss of moisture in the subgrade shall be prevented by sprinkling, sealing or covering with a subsequent layer or granular material. Excessive loss of moisture shall be construed to exist when the subgrade soil moisture content is more than 2 percent below the optimum.

Backfill adjacent to structures, pipe, etc. shall be as follows:

Material for backfill shall be clean soil free of trash, vegetation, etc. The material is to be placed in layers not to exceed 6" and compacted to the density of the undisturbed soil adjacent to the structure, but not less than 95% Standard Proctor. Special care shall be taken to prevent any wedging action against the structure.

### 3. SELECTION OF MATERIAL

In addition to the requirement in the excavation items of the specifications covering the general selection and utilization of materials to improve the roadbed, embankments shall be constructed in proper sequence to receive the select material layers shown on plans, with such modifications as may be directed by the Engineer. The layer of embankment immediately proceeding the upper layer of select material shall be constructed to the proper section and grade within a tolerance of not more than 0.10 foot from the established section and grade when properly compacted and finished to receive the select material layer.

### 4. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, Embankment shall be measured by the square yard in place or considered subsidiary to the applicable contract item as specified on the plans. Payment shall be at the bid price for the unit of measurement specified.

SECTION 022100  
SELECT MATERIAL (S-15)

1. DESCRIPTION

This specification shall govern the use of select material to be used to treat designated sections of roadways, embankments, trenches, etc. Select material shall be a mixture of sand and clay or other suitable granular material. The material shall be free from vegetation, debris and clay lumps. That portion of the select material passing a 40-mesh sieve shall have a liquid limit of 45 maximum, a plasticity index range from 6 to 13, and a calculated linear shrinkage of 8.5 maximum.

2. CONSTRUCTION METHODS

Select material shall be mixed uniformly and placed in layers not to exceed 6" loose depth. The material shall be brought to the wet side of optimum moisture content and compacted to a minimum of 95% Standard Proctor Density or as specified on the drawings. Each layer shall be complete before the succeeding layer is placed.

The finished surface of the select material shall conform to the grade and section shown on the plans.

3. MEASUREMENT & PAYMENT

Unless indicated otherwise in the Proposal, select material shall not be measured for pay, but shall be subsidiary to the appropriate bid item.

SECTION 022300  
LANDFILL CLAY LINER (S-77)

1. DESCRIPTION

"Landfill Clay Liner" shall consist of the construction of a three foot minimum thick clay liner and a six inch thick protective cover, shaping and finishing of all earthwork involved in conformity with the required liens, grades and typical cross sections and in accordance with specification requirements herein outlined.

2. MATERIALS

The material liner shall consist of material excavated from the site that has a coefficient of permeability of  $1 \times 10^{-7}$  cm/sec when compacted to 95% Standard Proctor density, a liquid amount of no less than 30, a plasticity index of no less than 15, and percent passing no. 200 sieve no less than 30.

All material not meeting the above requirements shall not be used for the clay liner and shall be removed from the work area.

3. CONSTRUCTION METHODS

- A. Prior to placing the landfill clay liner the area to be covered shall be stripped or all vegetation and the material so removed shall be disposed of at the site as directed by the Engineer. Washes, gully, wet areas, and yielding areas shall be corrected as directed by the Engineer.
- B. The clay material shall be broken up with a disk or other suitable equipment capable of breaking up the material to six inches or less. Dry clay material shall be broken up and wetted to achieve a uniform moisture content as required in Section C of Section 022300.3.
- C. The clay liner material shall be placed in maximum nine (9) inch loose to yield six (6) inch horizontal lifts along the bottom section of the sector and in six (6) inch parallel lifts along the side slopes. Construction of the bottom liner shall commence at the up slope side and proceed down slope. Construction of the side slopes may commence as each lift of bottom is completed or concurrently with its corresponding bottom lift. Prior to placing a subsequent lift, the previous lift shall be scarified to a depth of one inch and that material mixed and compacted with the material of the subsequent lift. The material shall be aerated or sprinkled with water as necessary to provide a moisture content from optimum to three percentage points above the optimum moisture. The material shall be compacted to 95% minimum of Standard Proctor density (ASTM D698).
- D. Equipment used for compaction of the clay liner shall be pad-footed rollers whose pad feet are sufficiently long to penetrate the loose soil lift and extend into the underlying layer. Lift thicknesses may have to be reduced depending on the length of the pad feet. Pad-footed rollers must have sufficient weight to exert large foot pressures capable of destroying the clod structure and compacting the clay to the proper density.
- E. Contractor may not begin subsequent lifts until the City has completed all the tests required by the Texas Water Commission. The tests required for each lift are listed in the testing schedule included in the construction drawings. The City conducted pre-construction testing of

the material to be used for the clay liner. Results of the tests are included in the contract documents. Whenever possible, the City will conduct the tests so as to eliminate or minimize delays. The Contractor shall coordinate his work and cooperate with the City personnel and testing laboratory in conducting the required tests. The tests required for each lift are as follows:

- 1) Coefficient of Permeability (The contractor will be allowed to proceed with subsequent lifts provided the density and moisture content of the lifts tested meet requirements of Section 022300.3 C).
- 2) Sieve Analysis
- 3) Atterberg Limits
- 4) Moisture and Density - The City shall conduct moisture and density testing as work progresses. Areas found not passing 95% Standard Proctor density or outside the required moisture range shall be reworked and retested. All original tests shall be paid for by the City. Cost of retests shall be paid for by the Contractor.
- 5) Thickness Verification - The City shall conduct thickness verification as the work progresses. The method to be used shall be by elevation surveys conducted by the City Surveyor. This survey work in no way relieves the Contractor of his duty to place and compact the clay liner in the specified lift thicknesses and to conduct his own surveys for construction control.

#### 4. MEASUREMENT AND PAYMENT

Landfill Clay Liner (Sloped and Bottom) shall be measured and paid for by the square yard, or as otherwise required, to the limits shown on the plans. Payment shall be full compensation for furnishing all materials, tools, equipment, and incidentals necessary to complete the work.

All work required for disposing of waste, including hauling, will not be paid for directly but shall be considered subsidiary to the various contract items.

SECTION 022302  
LANDFILL SECTOR EXCAVATION (S-21)

1. DESCRIPTION

"Sector Excavation" shall consist of the required excavation within the limits of the sector; the removal, stockpiling, or proper utilization of all excavated materials and the constructing, shaping and finishing of all earthwork on the entire length of sector and approaches to same in conformity with the required lines, grades and typical cross sections.

2. CONSTRUCTION METHODS

A. Excavation

- 1) Excavation shall commence at the low end of the sector and progress up slope. The bottom limit of the excavation shall be the bottom of the proposed liner.
- 2) Yielding or sandy material which allows ground water to enter the sector during construction of the clay liner shall be removed in sufficient quantity and backfilled with an impervious material to seal out the ground water. Backfill material and backfilling method shall be in accordance with Section C.
- 3) All excavated materials not utilized for liner construction shall be stockpiled at locations as directed by the Engineer.
- 4) All topsoil material (dark colored) shall be stockpiled in a separate stockpile from the tan colored clay material. All stockpiles will be within four sectors of the sector being excavated at locations selected by the landfill operator.

B. Drainage

During construction, the sectors shall be maintained in such condition as to insure proper drainage at all times, and ditches and channels shall be so constructed and maintained as to avoid damage or flooding of adjacent sectors.

C. Backfill of Over-excavated Existing Trenches

Sectors that have been over-excavated beyond the bottom of the proposed clay liners shall be backfilled to the bottom of the proposed clay liner. Backfilling operations shall be accomplished in 6-inch horizontal compacted lifts along the bottom section of the sector, and in parallel lifts to the side slopes along the side slopes. Compaction shall be to 95% Standard Proctor density. Backfill material shall be material that has a permeability of  $1 \times 10^{-7}$  cm/sec when compacted to 95% Standard Proctor density.

3. MEASUREMENT AND PAYMENT

Sector excavation shall be measured and paid for by the bank cubic yard, or as otherwise required, to the limits shown on the plans. Payment shall be full compensation for furnishing all materials, tools, equipment, and incidentals necessary to complete the work.

Backfilling of over-excavated existing trenches shall be paid for by the bank cubic yard of compacted backfill.

All work required for disposing of waste, including hauling, will not be paid for directly but shall be considered subsidiary to the various contract items.

SECTION 022420  
SILT FENCE (S-97)

1. DESCRIPTION

This specification shall govern all work necessary for providing and installing silt fences required to complete the project.

2. MATERIAL REQUIREMENTS

A. Geotextile shall meet the requirements for temporary silt fence per AASHTO m288.

B. Fence Reinforcement Materials:

Silt fence reinforcement shall be one of the following systems.

Type 1: Self-Supported Fence - This system consists of fence posts, spaced no more than 8-1/2 feet apart, and geotextile without net reinforcement. Fence posts shall be a minimum of 42 inches long, embedded at least 1 foot, and constructed of either wood or steel. Soft wood posts shall be at least 3 inches in diameter or nominal 2 x 4 in. and essentially straight. Hardwood posts shall be a minimum of 1.5 x 1.5 in. Fabric attachment may be by staples or locking plastic ties at least every 6 inches, or by sewn vertical pockets. Steel posts shall be T or L shaped with a minimum weight of 1.3 pounds per foot. Attachment shall be by pockets or by plastic ties if the posts have suitable projections.

Type 2: Net-Reinforced Fence - This system consists of fence posts, spaced no more than 8-1/2 feet apart, and geotextile with an attached reinforcing net. Fence posts shall meet the requirements of Self-Supported Fence. Net reinforcement shall be galvanized welded wire mesh of at least 12.5-gauge wire with maximum opening size of 4 inches square. The fabric shall be attached to the top of the net by crimping or cord at least every 2 feet, or as otherwise specified.

Type 3: Triangular Filter Dike - This system consists of a rigid wire mesh, at least 6-gauge, formed into an equilateral triangle cross-sectional shape with sides measuring 18 inches, wrapped with geotextile silt fence fabric. The fabric shall be continuously wrapped around the dike, with a skirt extending at least 12 inches from its upslope corner.

C. Packaging Requirements: Prior to installation, the fabric shall be protected from damage due to ultraviolet light and moisture by either wrappers or inside storage.

D. Certification and Identification: Each lot or shipment shall be accompanied by a certification of conformance to this specification. The shipment must be identified by a ticket or labels securely affixed to the fabric rolls. This ticket or label must list the following information:

- a. Name of manufacturer or supplier
- b. Brand name and style
- c. Manufacturer's lot number or control number
- d. Roll size (length & width)
- e. Chemical composition

3. MEASUREMENT & PAYMENT

Unless indicated otherwise in the Proposal, Silt fences shall be measured, by the linear foot. Payment shall include, but not be limited to, placing, maintaining and removing the silt fence.

SECTION 022430  
CELLULAR CONFINEMENT SYSTEM

1. DESCRIPTION

This specification shall govern for the furnishing and installation of a Cellular Confinement System required to complete the work.

2. MATERIALS

The cellular confinement system must be made of a high density polyethylene material and conform to the following minimum specifications:

MATERIAL SPECIFICATIONS

Specific Gravity	0.935-0.965, ASTM D792
Carbon Black Content	1.5-2.0%, ASTM D1603
Sheet Thickness	50 MIL +/- 5%, ASTM D3767
*ESCR	1,000 HR., ASTM D1693
Seam Peel Strength	55 lbs./in. of Cell Depth
Cell Depth	6 in.
Seam Hang Strength	160 lb. for 7 days with variable temp. from Ambient Room to 130 F
Cell Area (Max.)	38.4 sq. in.

\*ESCR - Environmental Stress Crack Resistance

The manufacturer/representative must be present for a minimum of 24 hours during the installation of the material to assure conformance with proper installation technique. The manufacturer/representative must submit a materials certification that the product supplied meets or exceeds these specifications.

3. INSTALLATION

Installation of this material shall be as in accordance with the manufacturer's recommendation and as directed by the Engineer. Subgrade shall be prepared, prior to placement of panels. A manufacturer's representative must be available to the Engineer and contractor for assistance in product installation.

4. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, cellular confinement system shall be measured by the square foot of material. Payment for this material shall be per square foot of material per plan quantity. This pay quantity shall include all anchor pins, staples or fasteners, extra material for toe-in or anchoring, waste material, labor, backfill, trimming of material and finishing complete in place.



SECTION 023020  
JACKING, BORING OR TUNNELING (S-65)

1. DESCRIPTION

This specification shall govern provisions of the required opening for the installation of conduits by the methods of jacking, boring, or tunneling as shown on the plans and in conformity with this specification.

2. MATERIALS

Unless indicated otherwise in the drawings, casing pipe shall be smooth pipe with minimum yield strength of 35,000 psi. Minimum casing wall thickness shall be as follows:

Casing Diameter (Inches)	Minimum Wall Thickness (Inches)
Less than 12	1/4
Over 12 to 18	5/16
Over 18 to 22	3/8
Over 22 to 28	7/16
Over 28 to 34	1/2
Over 34 to 42	9/16
Over 42 to 48	5/8
Over 48	Specified by Engineer

3. CONSTRUCTION REQUIREMENTS

Where encasement or carrier pipe is required to be installed under railroad embankments or under highways, streets, or other facilities by jacking, boring or tunneling methods, construction shall be made in a manner that will not interfere with the operation of the railroad, highway, or other facility, and will not weaken or damage any embankment or structure. During construction operations, barricades and lights to safeguard traffic and pedestrians shall be furnished and maintained, as directed by the engineer, until such time as the backfill has been completed and then shall be removed from the site.

The drilling of pilot holes for the alignment of pipe prior to its installation by jacking, boring or tunneling will not be a requirement but may be necessary to maintain grade. The drilling of pilot holes will be considered as incidental work and the cost thereof shall be included in such contract pay items as are provided in the proposal and contract.

The contractor shall take the proper precautions to avoid excavating earth beyond the limits of excavation needed to install the conduit. All damages by excavating, either to surface or subsurface structures, shall be repaired or replaced by the contractor at his own cost and expense.

The removal of any obstruction that may be found to conflict with the placing of this pipe will not be measured for payment or paid for as a separate contract pay item. The removal of any such obstruction will be included in such contract pay items as are provided in the proposal and contract.

The contractor shall dispose of all surplus materials at his own cost and expense at site approved by the engineer.

4. SAFETY REQUIREMENTS

Suitable bracing, shoring and barricading shall be placed as necessary to provide a safe condition. Proper ventilation for excavations and tunnels shall

be required. Any excavation that remains open after working hours shall be covered with a steel plate of sufficient thickness to support traffic.

5. CONSTRUCTION BY JACKING

If the grade of the pipe at the jacking end is below the ground surface, suitable pipes or trenches shall be excavated for the purpose of conducting the jacking operations and for placing end joints of the pipe. This excavation shall not be carried to greater depth than is required for placing of the guide and jacking timbers and no nearer the roadbed than the minimum distance shown on the plans.

At the other end of the pipe, an approach trench shall be excavated accurately to grade. All open trenches and pits shall be braced and shored in such a manner as will adequately prevent caving or sliding of the walls into the open trench or pit.

Heavy-duty jacks suitable for forcing the pipe through the embankment shall be provided. In operating jacks, even pressure shall be applied to all jacks used. A suitable jacking head not less than 6 inches larger than the outside diameter of the pipe, usually of timber and suitable bracing between jacks and jacking head, shall be provided so that pressure will be applied to the pipe uniformly around the ring of the pipe. The jacking head shall be of such weight and dimensions that it will not bend or deflect when an opening for the removal of excavated material as the jacking proceeds. A suitable jacking frame or backstop shall be provided. The pipe to be jacked shall be set on guides that are straight and securely braced together in such manner to support the section of the pipe and to direct it in the proper line and grade. All timber and other materials used in the construction of the jacking assembly will be of such quality and dimensions that they will withstand all stresses to which they are subjected in such a manner as to insure even pressures on the pipe during jacking operations. The whole jacking assembly shall be placed so as to line up with the direction and grade of the pipe.

As the jacking proceeds, the embankment material shall be excavated slightly in advance of the pipe in such a manner to avoid making the excavation larger than the outside diameter of the pipe, with the excavated material being removed through the pipe. The excavation for the underside of the pipe, for at least one third of the circumference of the pipe, shall conform to the contour and grade of the pipe. The excavation for the top half of the pipe shall conform closely to the outside diameter of the pipe and a clearance greater than 2 inches will not be permitted. All voids between the pipe and the earth shall be filled with non-shrinking grout. Grout holes shall be provided in the pipe. The grouting shall follow immediately upon completion of the jacking operation.

All carrier pipes installed by jacking shall be supported as required by the plans.

The distance that the excavation shall extend beyond the end of the pipe depends on the character of the materials, but it shall not exceed 2 feet in any case. The pipe, preferably, shall be jacked from the low or downstream end. Lateral or vertical variation in the final position of the pipe from the line grade established by the engineer will be permitted only to the extent of 1 inch per 10 feet, maximum of 6 inches, provided that such variation shall be regular and only in one direction and that the final grade of flow line shall be in the direction indicated on the plans.

When jacking of pipe is once begun, the operation shall be carried on without interruption, insofar as practicable; to prevent the pipe from becoming firmly set in the embankment.

Any pipe damaged in jacking operations shall be repaired or removed and replaced by the Contractor at his entire expense.

The pits or trenches excavated to facilitate jacking operation shall be filled immediately after the jacking of the pipe has been completed unless an encasement only has been installed; in which case, the trenches and pits shall be left open until the carrier pipe has been laid through and manholes have been built if required. The pits or trenches shall then be backfilled in accordance with 022020, Excavation and Backfill for Utilities & Sewers.

7. CONSTRUCTION BY BORING

The hole shall be bored mechanically with a suitable boring assembly designed to produce a smooth, straight shaft and so operated that the completed shaft will be at the established line and grade. The size of the bored hole shall be of such diameter to provide ample clearance for bells or other joints.

Voids outside the casing shall be grouted with non-shrinking grout and will be considered subsidiary work. In addition to the requirements stated above, the applicable provisions of "Construction By Jacking", in regard to the construction of trench, tolerance in line and grade, method of operation, backfilling, etc., shall govern for construction by boring.

7. CONSTRUCTION BY TUNNELING

The tunnel shall be excavated in such a manner and to such dimensions, which will permit placing of the proper supports necessary to protect the excavation. The contractor shall take the proper precautions to avoid excavating earth beyond the limits of excavation shown on the plans. All damages by excavating, either to surface or subsurface structures, shall be repaired or replaced by the contractor at his own cost and expense.

If required by the plans or if required for safety, suitable steel or timber sheeting, shoring and bracing shall be used to support the sides and roof of the excavation. Supports may be left in place provided that they clear the steel liner plate or carrier pipe. No separate payment will be made for supports left in place. Nothing contained herein shall prevent the contractor from placing such temporary or permanent supports as he shall deem necessary, nor shall it be construed as relieving the contractor from his full responsibility for the safety of the work, and for all damages to persons and property.

Liner plate shall be place when the foundation is in a condition satisfactory to the engineer. Tunnel dimensions shall be minimum dimensions and subsequent backfill, concrete or grout fill, shall be at the expense of the contractor. The liner plate shall be laid true to line and grade. Tolerance in line and grade shall be as specified in, "Construction by Jacking".

The void between the tunnel wall and the tunnel lining shall be backfilled with non-shrinking grout having a minimum compressive strength of 1000 pounds per square inch at 28 days. No concrete or grout shall be placed around the pipe unless the sheeting, bottom, sides and roof of the tunnel are in a condition satisfactory to prevent displacement of the liner plate.

All pipe damaged during construction operations shall be repaired or removed and replaced by the contractor at his entire expense.

8. JOINTS

If corrugated galvanized metal pipe is used, joints may be made by field bolting

or by connecting bands, whichever is feasible. If reinforced concrete pipe 24 and larger in diameter with tongue and groove joints is used for the encasement pipe, the interior joints for the full circumference shall be sealed and packed with mortar and finished smooth and even with the adjacent section of pipe. If steel pipe is used for the encasement pipe, the joints shall be welded sealed for the full circumference.

9. MEASUREMENT & PAYMENT

Unless indicated otherwise in the proposal, Jacking, Boring, and tunneling shall not be measured for pay but shall be subsidiary to the casing pipe or the liner plate.

SECTION 023040  
TUNNEL LINER PLATE (S-65A)

1. DESCRIPTION

This specification shall govern all necessary work for furnishing tunnel liner plate required to complete the project.

2. MATERIALS

Tunnel liner plate shall be designed in accordance with AASHTO "Design Specification for Tunnel Liner Plate". It shall be capable of withstanding a unit pressure of 1,400 lb. per square foot at top of liner based on safety factors of 3, 2, 3 for seam strength, buckling and stiffness, respectively.

Liner plate shall be fabricated from structural quality, hot-rolled carbon-steel sheets or plates conforming to ASTM Specification A-569. Plates shall be accurately curved to suit the tunnel cross section and shall be of uniform fabrication to allow plates of similar curvature to be interchanged.

All plates shall be punched for bolting on both longitudinal and circumferential seams and shall be so fabricated as to permit complete erection from the inside of the tunnel. The longitudinal seam shall be of the lap type, with an offset equal to gauge of metal for the full width of plate to allow the cross section of the plate to be continuously through the seam. Circumferential hole spacing will be a multiple of plate length to allow staggering of the longitudinal seam.

Material shall be galvanized and zinc coated in accordance with ASTM Specification A 123, except that the zinc shall be applied at the rate of two (2) ounces per square foot total for both sides.

Material shall be bituminous coated and conform to AASHTO Designation M190.

Bolts and nuts shall be of the diameter and length as recommended by the manufacturer. Galvanized bolts and nuts are required with galvanized plate and shall conform to ASTM Specification A 153.

Liner plate shall be assembled in accordance with manufacturer's instructions.

Longitudinal seams shall be staggered between rings. Liner plate shall be a nominal diameter of 48" after assembly and have a minimum thickness of .1046" or 12 gauge.

3. MEASUREMENT & PAYMENT

Unless indicated otherwise in the Proposal, Tunnel liner plate shall be measured and paid for by the linear foot.

SECTION 023080  
TIMBER FOUNDATION PILING (S-95)

1. DESCRIPTION

This specification shall govern all work necessary for furnishing and installing timber piles required to complete the project.

2. EQUIPMENT

Equipment used shall be of current design, safe, and of the required capacity and condition necessary to complete the project.

The driving equipment shall meet the energy requirements set forth as follows:

Average Pile Diameter (Inches)	Minimum Energy Requirements (foot-pounds)
8 and less	7,000
8 to 18	15,000
Over 18	22,000

3. MATERIALS

Piles shall be southern yellow pine of size and length indicated on the drawings, Piles shall be branded in accordance with A.W.P.A. Standard ML. Piles shall comply with physical requirements of ASTM D25 "Standard Specification for Round Piles".

Foundation piles shall be treated in accordance with A.W.P.A. Standards C1-82 and C3-81 (or latest revision) to a minimum final retention of 12 pounds per cubic foot with creosote conforming to A.W.P.A. Standard P1-78 (or latest revision).

4. CONSTRUCTION METHODS

It is the intent of this specification that all proposed piles be driven to the capacity indicated in the drawing while also achieving maximum penetration. The determination of the optimum amounts of jetting and driving shall be done by the Engineer during the pile driving operation. The Engineer will establish jetting and driving lengths that will result in minimal pile splicing. Each pile shall initially jetted to an elevation or depth indicated by the Engineer. The pile shall then be driven until it achieves the capacity indicated in the drawing. The bearing capacity, R (tons), of the pile shall be determined by the "Engineer News" formula given as follows:

$$R = 2(WxH)/(S+1) \quad \text{For Drop Hammer}$$

$$R = 2(WxH)/(S+.1) \quad \text{For Single-Action Steam Hammer}$$

$$R = 2E/(S+.1) \quad \text{For Double-Action Steam Hammer}$$

where:      W = weight of hammer (tons)  
              H = length of drop (feet)  
              R = pile bearing capacity (tons)  
              S = final driving penetration (inches per blow)

If the pile is driven to the cut-off elevation and has achieved at least 80% of the specified capacity at the cut-off elevation, the pile shall be immediately spliced and driving continued until capacity is achieved. Splices shall not be allowed.

Final trim shall be treated in accordance with A.W.P.A. M4-80.

All piles (batter piles excluded) shall be driven vertically. Before beginning of the driving operation, lead shall be checked for plum. At cut-off, the piles shall not be over 3 inches from the position indicated on the drawing.

It shall be the responsibility of the contractor to select appropriate hammer, pile caps, tips, etc., as required to place the pile. All piles damaged during handling or placement shall be replaced by the contractor at no additional cost to the City.

The contractor shall cooperate with the Engineer during driving operation. No piling shall be driven in the absence of the Engineer. The contractor shall keep an accurate record of the pile driving operation. The records shall be kept on the jobsite by the contractor for the Engineer to review and shall be submitted to the Engineer, upon completion of the project.

#### 5. CERTIFICATION & TESTING

Piles shall be branded in accordance with A.W.P.A. Standard M6 (latest revision). Compliance with specifications regarding physical characteristics and preservative retention shall be verified by lab reports from an independent testing lab. The reports shall be delivered with the material shipment. Failure to comply with these specifications will be cause to reject the shipment. The City reserves the right to have additional lab testing performed prior to acceptance of materials.

#### 6. MEASUREMENT & PAYMENT

Unless indicated otherwise in the Proposal, piles will be measured by the linear foot along the centerline from the point at which the pile cut-off to the point of maximum penetration. Any length above cut-off elevation will not be measured for pay. Payment shall include, but not be limited to, transporting, storing, cutting, splicing, and placement of piles.

SECTION 024020  
RAILROAD TRACKS (S-130)

**1. SCOPE** - This section covers furnishing all labor, materials, tools, equipment and services required for the rehabilitation of the railroad tracks as specified herein and called for on the plans, including placing ballast, setting ties, laying and aligning track to grade required to complete the project.

**2. GENERAL** - All construction and installation not noted herein or on the drawings shall conform to American Railway Engineering Association (AREA) specifications or Union Pacific Technical Specifications for Industrial Track.

**3. MATERIALS**

Top Ballast shall be hard rock crushed to suitable size; crushed blast furnace or properly processed open-hearth slag; or crushed gravel with sufficient angular physical properties to prevent rolling. The top ballast shall meet the following gradation requirements:

Sieve Opening	Passing
1 1/2 Inch	100%
1 Inch	90 - 100%
3/4 Inch	40 - 75%
1/2 Inch	15 - 35%
3/8 Inch	0 - 15%
No. 4	0 - 5%

Ties shall be new creosote-treated oak ties, sawed top, bottom and sides, and minimum size 7" thick x 9" wide x 8'-6" long. These cross ties shall be in accordance with AREA specifications for Cross ties, latest revision. The treatment shall be empty-cell process with eight pounds per cubic foot retention, in accordance with AREA specifications for Treatment, latest revision. Creosote shall be 40-60 creosote-coal tar solution in accordance with AREA specifications for Preservatives. No substitutes unless approved by the Engineer.

Switch Ties shall be new creosote-treated oak ties in accordance with AREA specifications for Switch Ties, latest revision. Treatment shall be same as above for Cross Ties. Dimensions shall be in accordance with AREA Plan 912-58. No substitutes unless approved by Engineer.

Guard Rails shall be 5" x 5" hardwood or yellow pine; treatment shall be same as above for Cross-Ties.

Tie Plugs shall be in accordance with AREA specification for Tie Plugs, latest revision.

Tie Plates shall be standard, single or double-shoulder, properly sized to fit the rail section used. Tie plates may be either new or used; if new they shall be AREA standard; if used, they shall be in good condition, free from excessive corrosion. Use double tie plates for guard rails.

Spikes shall be new spikes 5/8" square x 6" long in accordance with AREA specifications for High-Carbon Steel Track Spikes, latest revision.

Rails shall be new 90# ARA-A relay rails. Relay rail shall be in good condition, free from bends, broken flanges, flow, flat spots, end batter, and wheel burns. Cut off battered or defective ends, square and re-drill bolt holes as required. Rails, if necessary, will be cut with a saw during installation and repair or track. No oxygen-acetylene cutting of rails will be permitted.



Angle Bars will be four-hole new or used. Angle bars shall fit the rail section used and shall be in good condition, straight, and free from excessive corrosion.

Track Bolts shall be new 1" heat-treated carbon-steel track bolts and nuts in accordance with AREA specifications for heat-treated carbon-steel and alloy-steel track bolts, and carbon-steel nuts, latest revision.

Spring Washers shall be steel in accordance with AREA specifications for Spring Washers, latest edition.

Rail Anchors shall be new steel rail anchors, "Improved Fair," or approved equal.

Turnouts - Frogs, if required, shall be sized to match or as shown on drawings and shall be bolted-rigid frogs conforming to AREA Plan 323-55. Frogs shall be complete, including a full set of twin hook tie plates. Switches shall be 16'-16" long split-switch, conforming to AREA Plan 112-55. Switches shall be complete, including full set of slide and heel plates, heel blocks, and switch rods.

Two 11' guard rails shall be used at each frog. Guard rails shall conform to AREA Plan 504-55, except shall be furnished complete with guard rail plates and adjustable guard rail clamps.

All turnout dimensions shall conform to AREA Plan 910-41 unless noted otherwise on the drawing.

Switch-stands shall be automatic safety switch stands, Ramapo No. 20-C, or an approved equal.

Bumping Post - Buda Bumping Post #20 or approved equal.

Rail Clips - Rail clips used to anchor the rails through the buildings shall be L.B. Foster #106.

Gauge Rods shall be 1½" diameter adjustable gauge rods, either new or used. If used, they shall be straight, the threads good, and free from excessive corrosion.

**4. CONSTRUCTION** - Cross ties shall be laid on 21" centers at right angles to the rail with one end lined uniformly. Ties must be laid with the heart side down. The bottom of the rail, the tie plate, and the bearing surface of the tie shall be cleaned before rail is laid. Switch ties shall be spaced and sized in accordance with AREA Plan 912-58.

Track shall be fully tie-plated. Tie plates must be applied in a workmanlike manner, at the time the rail is laid, with the shoulder in contact with the field side of the rail base for the entire length of the shoulder.

Metal, fiber, or wood shims must be used to provide the proper opening between the rails, and thermometer used to determine the thickness of shims to be used in accordance with the standards of the AREA. All shims must be removed to within 12 rail lengths of the laying; after completion, all shims must be removed.

Necessary gauging at joints, centers, and quarters must be done at the time rail is laid to maintain gauge recommended by the AREA. Do not remove gauge until spikes are driven home.

All joints shall be fully bolted and rail drilled where necessary. Spring washers shall be used on all bolts. Burning of bolt holes will not be allowed. All bolts must be tight.

All rail joints must be staggered and shorter rail lengths used to maintain the proper stagger or curves. On tangent track, or on curves less than three degrees, rail shall be spiked with not less than two spikes per tie plate. On curves three degrees and over, four spikes shall be used per tie plate.

All spikes shall be started and driven vertically and square with the rail and so driven as to allow 1/8" to 3/16" space between the underside of the head of the spike and the top of the base of the rail. In no case shall the spike be over driven, or straightened while being driven. No spikes shall be driven against the ends of joint bars.

Tie plugs shall be used to fill all spike holes.

Rail anchors shall be applied at the rate of eight anchors per 39' rail length. The anchors shall be placed approximately uniformly along the rail length and boxed around the same tie on opposite rails to resist movement in both directions.

Gauge rods shall be applied at the rate of five per 39' rail on all curves of ten degrees or over.

Switches must be left in proper adjustment and oiled, special care being given to the bending of the stock rail.

The preliminary surfacing gang shall follow the unloading of ballast as closely as practical. In using jacks, they must be placed close enough together to prevent undue bending of the rail or strain on the joints. Both rails must be raised at one time and as nearly uniformly as possible. The track shall be so lifted that after a period of not less than three days after the last lift, it will be necessary to give it a final lift of not less than one inch nor more than two inches to bring it to the grade of the stakes. All ties that are pulled loose shall be replaced in proper position. Ballast shall be well packed and tamped from a point 15" inside of each rail on both sides of the tie to the ends of the ties.

When the track has been raised to within one or two inches of the final grade and properly compacted by traffic, a finishing lift shall be made and the track brought to a true surface.

All track shall have a minimum of 12" of top ballast below the bottom of the ties.

The Contractor is to understand that any work not specifically mentioned in this specification, but which is necessary for the proper carrying out of the intent thereof, shall be required and applied.

##### **5. MEASUREMENT AND PAYMENT**

Unless indicated otherwise in the Proposal, Track Resurfacing and Track Reconstruction shall be measured by the linear foot of tracks, measured along the centerline of the tracks. Measurement shall include, but not be limited to, all labor, materials, equipment, and incidentals required to restore the track to the required section, with the exception of those items specifically itemized in the proposal.

SECTION 024060  
MARINE TIMBER (S-93)

1. DESCRIPTION

This specification shall govern all work necessary for furnishings and installing timber required to complete the project. The lengths and dimensions of timbers shall be as shown on the plans or as determined in the field by the Engineer.

2. MATERIALS

Unless specified otherwise, all timber members shall be new Southern Yellow Pine, pressure treated in accordance with A.W.P.A. Standard C1-78, C2-80 and C18-77 (or latest revisions). All timber shall be treated with chromated copper arsenate (CCA) conforming To A.W.P.A. Standard P5-78 (or latest revision) to a minimum final retention of .6 p.c.f. by assay (.4 p.c.f. by assay may be used where specifically indicated on the Plans or Special Provisions). The grade of lumber shall be as specified on the Plans or Special Provisions.

All timber shall be S4S milled to applicable size and tolerance, unless noted otherwise in the drawings and all materials shall be new and shall not have been previously used unless otherwise noted.

3. CONSTRUCTION METHODS

Field and handling procedures shall comply with A.W.P.A. Standard M4-80 (or latest revision). All timber shall be treated to comply with A.W.P.A Standard M4-80.

Nailing of members shall be sufficient to ensure adequate joining of members. Nails shall be hot-dipped USS common domestic manufacturer. USS box end nails will not be allowed. Nails shall be of a size as indicated on the drawings. Where sizes are not indicated, they shall be in accordance with standard acceptable practice.

Lag bolts shall have lead holes for the shank bored the same diameter as the shank and the same depth as the length of the unthreaded shank. The lead holes for the threaded portion shall have a diameter of 60 to 75 percent of the shank diameter and a length equal to at least the length of the threaded portion. Lead holes shall be not be bored completely through the piles. If this is done, the exit hole shall be plugged. The threaded portion of the screw shall be inserted into the lead hole by turning with a wrench and not by driving with a hammer. Epoxy shall be used as a lubricant on the lag bolt and lead hole to facilitate insertion and prevent damage to the bolt and galvanized finish.

Through bolted joints shall have lead holes bored from 1/32 to 1/16 inch larger than the bolts. Tight fit requiring forcible driving is not recommended.

4. CERTIFICATION & TESTING

Timber shall be marked with the identification of the treating company. Compliance with specifications regarding physical characteristics and preservation retention shall be verified by lab reports from an independent testing lab. The reports shall be delivered with the material shipment. Failure to comply with these specifications will be cause to reject the shipment. The City reserves the right to have additional lab testing performed prior to acceptance of materials. If the materials do not meet specified

requirements, the Contractor shall pay for the lab testing.

5. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, Marine timber shall not be measured for pay, but shall be subsidiary to the appropriate bid item.

SECTION 024080  
TIMBER PILING FOR PIER CONSTRUCTION (S-94)

1. DESCRIPTION

This specification shall govern shall work necessary for furnishing and installing timber piles required to complete the project.

2. MATERIALS

All piles shall be Souther Yellow Pine, complying with ASTM Standard D25-73 (or latest revision). Piles shall be pressure treated in accordance with A.W.P.A. Standard C1-78 and C18-77 (or latest revisions) with chromated copper arsenate (CCA) conforming to A.W.P.A. Standard P5-78 (or latest revision) to minimum final retention of 2.5 p.c.f. by assay.

3. CONSTRUCTION METHODS

Equipment used for the installation of piles shall be of current design, safe, and of the required capacity and condition necessary to complete the project. The Contractor shall be responsible for safe storage and handling of all piles furnished to or by him and shall use every precaution to avoid damage to the treated piling.

The embedment depth shall be measured from the top of the firm, hard virgin material (not shoal deposits) to the maximum penetration of the pile. All piles (battered piles excluded) shall be driven vertically. Before beginning the driving operation, lead shall be checked for plumb. At the cut-off point, the pile shall not be over three (3) inches from the position indicated on the plans. It shall be the responsibility of the contractor to select the appropriate hammer, pile caps, tips, etc., as required to place the piles. All piles damaged during handling or placement shall be replaced by the Contractor at no additional cost to the City.

After final trim, all piles shall be sealed at the top in compliance with A.W.P.A. Standard M4-80.

An accurate record of pile location, length and embedment depth shall be kept by the Contractor for each pile driven. The record shall be kept on the job site for the Engineer's review and shall be submitted to the Engineer upon completion of the pile driving operation.

4. CERTIFICATION AND TESTING

Piles shall be branded in accordance with A.W.P.A. Standard M6 (latest revision). Compliance with specifications regarding physical characteristics and preservative retention shall be verified by lab reports from an independent testing lab. The reports shall be delivered with the material shipment. Failure to comply with these specifications will be cause to reject the shipment. The City reserves the right to have additional lab testing performed prior to acceptance of materials. If the materials do not meet specified requirements, the Contractor shall pay for the lab testing.

5. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, piles will be measured by the linear foot along the centerline from the point at which the Contractor cuts off the pile to the depth of minimum embedment. The City will allow payment for one (1) additional foot of embedment should the Contractor elect to drive

the pile deeper than the minimum embedment depth. Any length above the top cut-off will not be measured for pay. Payment shall include, but not be limited to transporting, storing, cutting, drilling and placement of the piles.

SECTION 025202  
SCARIFYING AND RESHAPING BASE COURSE (S-23)

1. DESCRIPTION

"Scarifying and Reshaping Base Course" shall consist of scarifying and reshaping the existing base course (with or without asphalt surface) to the line, grade and section as indicated on the plans.

2. CONSTRUCTION METHODS

The existing base and surface shall be scarified to the width and depth indicated on the plans. Subgrade shall remain undisturbed, unless indicated otherwise on drawings. Any asphalt surfacing shall be broken into particles no larger than 2.5 inches. The asphalt surfacing shall then be uniformly mixed with the existing base. Additional base material, where required to achieve the lines and grades shown on the plans, shall also be added to and uniformly mixed with the existing scarified base material.

The base material shall be shaped and rolled after mixing and allowed to set at least 48 hours before final compaction. Moisture content shall be maintained in the material during the 48-hour period. Material shall be sprinkled or aerated to optimum moisture, and compacted in layers (6 inch maximum loose depth) to a minimum density of 95% Modified Proctor (AASHTO T180), at a moisture content on the wet side of optimum. Use mechanical tamps in areas inaccessible to rollers.

Upon completion of compaction, the surface shall be smooth and conform to line, grade and section as shown on the plans. Areas with any deviation in excess of 1/2" in cross-section, and in lengths of 16 feet measured longitudinally, shall be corrected by loosening, adding or removing material, reshaping, and re-compacting by sprinkling and rolling. Moisture content shall be maintained on the wet side of optimum until paving is complete.

If required, lime or cement shall be applied in the amount indicated on the plans. Lime shall be applied and the treated base mixed, cured, compacted and finished in accordance with "Lime Stabilization." Cement shall be applied and treated base mixed, cured, compacted and finished in accordance with "Cement Stabilized Caliche Base."

3. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, Scarifying and Reshaping Base Course shall be measured by the square yard of base scarified and reshaped, regardless of surface. Measurement shall include, but not be limited to, scarifying, watering, compacting, supplementing, removing, and mixing base material. Payment shall include all materials, labor, equipment, tools, and incidentals necessary for the completion of work.

SECTION 025205  
PAVEMENT REPAIR, CURB, GUTTER, SIDEWALK, & DRIVEWAY REPLACEMENT (S-54)

1. DESCRIPTION

This specification shall govern the removal and replacing of all types of pavement and surfacing required to complete the project.

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2. MATERIALS

Unless otherwise specified on the plans, materials and proportions used along with this specification shall conform to the respective following specifications: 025220 "Flexible Base Caliche"; 025424 "Hot Mix Asphalt Pavement"; 025610 "Concrete Curb and Gutter"; and 025612 "Concrete Sidewalks and Driveways", Class "A" concrete per 030020 "Portland Cement Concrete"; 032020 "Reinforcing Steel"; 038000 "Concrete Structures".

3. METHOD OF CUTTING

The outline of the trench shall be marked upon the surface of the pavement to be cut, and all cuts into the pavement shall be saw cut as nearly vertical as it is possible to make them. All unwanted materials removed shall be disposed of by the contractor and shall not be used as backfill material.

4. BACKFILL OF TRENCH

Excavation and backfilling of trench shall be in accordance with Specification "Excavation & Backfill Utilities and Sewers."

5. REPLACING STREET AND OTHER PAVEMENT

All pavements, driveways, sidewalks, and curbs and gutters which are cut shall be replaced in a workmanlike manner, with like or better or per pavement repair details in drawings.

6. REPLACING DRIVEWAY PAVEMENT on all concrete driveway pavements, the replacement shall consist of a reinforced Class "A" concrete slab with a minimum thickness of six (6) inches. The type of finish for the replaced section shall be the same as that appearing on the old pavement. Reinforcement shall be #4 bars at 12" each way. Any other type shall be replaced with like or better replacement.

7. REPLACING SIDEWALKS

On all sidewalk pavements, the replacement shall consist of a reinforced Class "A" concrete slab four (4) inches thick. The type of finish for the replaced section shall be the same as that appearing on the old sidewalk. Replacement shall, in general, be to original joint or score marks. Reinforcement shall be 4" x 4" - W2.9 welded wire fabric. Shell or asphalt sidewalks shall be replaced with caliche or asphalt surface.



8. REPLACING CURB AND GUTTER

On all curb and gutter, the replacement shall consist of a section conforming in all details to the original section or to City Standard if required by the Engineer. Cuts through the curb shall be replaced with Class "A" concrete. Preserve original steel and reinforce all new curbs with 3 - #4 bars. Adjust grades for drainage.

9. REPAIRING STREET SHOULDERS AND UNIMPROVED STREETS

On streets or roads without curb and gutter, where a shoulder is disturbed it shall be restored to like or better condition. The shoulder surface shall be rolled to an acceptably stable condition.

10. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the proposal, Pavement Repair shall be measured by the square yard, curb and gutter replacement shall be measured by the linear foot, sidewalk and driveway replacement shall each be measured by the square foot. Payment will be made at the unit price bid for the completed work and will include all labor, materials, equipment, tools and incidentals, required to complete the work.

SECTION 025208  
Soil - Cement Base (S-17)

1. DESCRIPTION

This specification shall govern all work required for Soil-Cement Base necessary to complete the project.

2. MATERIALS

2.1 **Soil.** Soil shall consist of approved material free from vegetation or other objectionable matter encountered in the existing roadbed and other acceptance material used in preparation of the roadbed in accordance with this specification.

2.2 **Portland Cement.** Cement shall be either Type I or II Portland cement. The Contractor, at his option, may use bulk cement, provided the apparatus for handling, weighing and spreading the cement is approved by the Engineer in writing. Cement weighing equipment shall be as specified below.

2.3 **Water.** Water shall be free from substances deleterious to the hardening of the cement treatment and shall be approved by the Engineer.

3. EQUIPMENT

Equipment necessary for the proper construction of the work shall be on the project, in first-class working condition, and be approved by the Engineer, both as to type and condition, prior to the start of construction operations. The Contractor shall at all times provide sufficient equipment to enable continuous execution of the work and its completion in the required number of working days.

Portland cement treatment for materials in place may be constructed with any machine or combination of machines and auxiliary equipment that will produce results as outlined in this specification.

Mixing may be accomplished by: (1) a multiple-pass traveling mixing plant or (2) a single-pass traveling mixing plant.

The equipment provided by the Contractor shall be operated by experienced and capable workmen and shall be that necessary to provide a cement treatment meeting the requirements herein specified.

4. CONSTRUCTION METHODS

4.1 **General.** It is the primary requirement of this specification to secure a completed course of treated material containing a uniform Portland cement mixture free from loose or segregated areas, of uniform density and moisture content, well bound for its full depth and with a smooth surface suitable for placing subsequent courses. It shall be the responsibility of the contractor to regulate the sequence of his work to process a sufficient quantity of material to provide full depth as shown on plans, to use the proper amount of Portland cement, maintain the work and rework the courses as necessary to meet the above requirements.

Cement treatment shall not be mixed or placed when the air temperature is below 40°F and is falling, but may be mixed or placed when the air

temperature is above 35°F and is rising, the temperature being taken in the shade and away from artificial heat and with the further provision that cement treatment shall be mixed or placed only when weather conditions, in the opinion of the Engineer, are suitable.

- 4.2 **Preparation of Roadbed.** Before other construction operations are begun, the roadbed shall be graded and shaped as required to construct the Portland cement treatment for material in place in conformance with the lines, grades, thickness and typical cross section shown on the plans. Unsuitable soil or material shall be removed and replaced with acceptable soil.

The subgrade shall be firm and able to support without displacing the construction equipment and the compaction hereinafter specified. Soft or yielding subgrade shall be corrected and made stable before construction proceeds.

- 4.3 **Pulverization.** The soil shall be so pulverized that, at the completion of moist-mixing, when all non-slaking aggregate retained on the No. 2 sieve are removed, the remaining material shall meet the following requirements when tested from the roadway in the roadway condition by Test Method Tex-101-E (Part III).

	Percent
Minimum passing 1-inch sieve .....	100
Minimum passing No. 4 sieve .....	80

Old bituminous wearing surface shall be pulverized so that 100 percent will pass the 2-inch sieve.

- 4.4 **Application of Cement (Roadmix).** Portland cement shall be spread uniformly on the soil at the rate specified on the plans or approved by the Engineer. If a bulk cement spreader is used, it shall be positioned by stringlines or other approved method during spreading to insure a uniform distribution of cement.

Cement shall be applied only to such an area that all the operations can be continuous and completed in daylight within 6 hours of such application.

The percentage of moisture in the soil, at the time of cement application, shall not exceed the quantity that will permit uniform and intimate mixture of soil and cement during dry mixing operations, and it shall not exceed the specified optimum moisture content for the soil cement mixture.

No equipment, except that used in spreading and mixing, will be allowed to pass over the freshly spread cement until it is mixed with the soil.

- 4.5 **Mixing and Processing.** Unless otherwise shown on the plans, either method (a) or (b) below may be used at the option of the Contractor.

(a) Multiple-Pass Traveling Mixing Plant. After the cement has been applied, it shall be dry-mixed with the soil. Mixing shall continue until the cement has been sufficiently blended with the soil to prevent the formation of cement balls when water is applied. Any mixture of soil and cement that has not been compacted and finished shall not remain undisturbed for more than 30 minutes.

Immediately after the dry mixing of soil and cement is complete, water as

necessary shall be uniformly applied and incorporated into the mixture. Pressurized equipment and water supply provided shall be adequate to insure continuous application of the required amount of water to sections being processed within 3 hours of application of the cement. Proper care shall be exercised to insure proper moisture distribution at all times. After the last increment of water has been added, mixing shall continue until a thorough and uniform mix has been obtained.

(b) Single-Pass Traveling Mixing Plant. After the cement has been applied it shall be sufficiently dry-mixed with the soil to prevent the formation of cement balls when water is applied. Unpulverized soil lumps in the soil cement mixture immediately behind the mixer will not be allowed. Should this condition prevail, the Contractor shall "pre-wet" the raw soil as necessary to correct this condition.

The water shall be provided with means for visibly and accurately gauging the water application. The water shall be applied uniformly through a pressure spray bar.

After cement is spread, mixing operations shall proceed as follows:

The mixer shall in one continuous operation mix the air-dry soil and cement full depth, and the required moisture uniformly, thoroughly moist-mix the soil, cement and water, spread the completed soil cement mixture evenly over the machine processed width of the subgrade and leave it in a loose condition ready for immediate compaction. The soil and cement mixture shall not remain undisturbed, after mixing and before compacting, for more than 30 minutes.

4.6 **Compaction and Finishing.** The material shall be compacted to not less than 98% standard proctor unless otherwise shown on the plans. At the start of compaction, the percentage of moisture in the mixture and in unpulverized soil lumps, based on over-dry weights, shall not be below or more than two percentage points above the specified optimum moisture content and shall be less than that quantity which will cause the soil cement mixture to become unstable during compaction and finishing. When the uncompacted soil cement mixture is wetted by rain so that the average moisture content exceeds the tolerance given at the time of final compaction, the entire section shall be reconstructed in accordance with this specification at the sole expense of the Contractor.

Prior to the beginning of compaction, the mixture shall be in a loose condition for its full depth. The loose mixture then shall be uniformly compacted to the specified density within 2 hours.

After the soil and cement mixture, excepting the top mulch, is compacted, water shall be uniformly applied as needed and thoroughly mixed in with a spiketooth harrow or equal. The surface shall then be reshaped to its required lines, grades and cross section and then lightly scarified to loosen any imprint left by the compacting or shaping equipment.

The resulting surface shall be thoroughly rolled with a pneumatic tire roller and "clipped", "skinned" or "tight bladed" by a power grader to a depth of approximately ½ inch, removing all loosened soil and cement from the section. The surface shall then be thoroughly compacted with the pneumatic roller, adding small increments of moisture as needed during rolling. If plus No. 4 aggregate is present in the mixture; one complete coverage of the section with the flat wheel roller shall be made immediately after the "clipping" operation. When directed by the Engineer, surface finishing methods may be varied from this procedure

provided a dense, uniform surface, free of surface compaction planes, is produced. The moisture content of the surface material must be maintained at its specified optimum during all finishing operations. Surface compaction, rolling, blading and finishing shall proceed in such a manner as to produce a smooth, closely knit surface, free of cracks, ridges or loose material conforming to the crown, grade and line shown on the plans, within 3 hours of initial mixing.

## 5. CURING

5.1 **Protection and Cover.** After the cement treated course has been finished as specified herein, the surface shall be protected against rapid drying by either of the following curing methods for a periods shown on plans but in no case less than 3 days or until the surface or subsequent courses are placed:

- (a) Maintain in a thorough and continuously moist condition by sprinkling.
- (b) Apply a 2-inch layer of earth on the completed course and maintain in a moist condition.
- (c) Apply a single course surface treatment. Unless shown otherwise on the plans, the asphalt shall be HFRS-2, in accordance with "Asphalts, Oils and Emulsions" in the Texas Department of Highways and Public Transportation Standard Specifications. The single course surface treatment shall be placed in accordance with Section 025418 "Surface Treatment, except HFRS-2 asphalt shall be used in lieu of AC-5 and the asphalt shall be applied at .5 gallons per square yard.

5.2 **Surface.** The surface or other base courses may be applied on the finished base as soon after completion as operations will permit.

## 6. CONSTRUCTION JOINTS

At the end of each day's construction, a straight transverse construction joint shall be formed by cutting back into the total width of completed work to form a true vertical face free of loose and shattered material.

Cement treatment for large, wide areas shall be built in a series of parallel lanes of convenient length and width meeting and approval of the Engineer.

## 7. TRAFFIC

Completed sections of cement treated material in place may be opened immediately to local traffic and to construction equipment after application of the single course surface treatment and to all traffic after the final surface course, provided the cement treated course has hardened sufficiently to prevent marring or distorting the surface by equipment or traffic.

## 8. MAINTENANCE

The Contractor shall be required, within the limits of his contract, to maintain the cement treated course in good condition until all work has been completed and accepted. Maintenance shall include immediate repairs of any defects that may occur. This work shall be done by the Contractor at his own expense and repeated as often as may be necessary to keep the area continuously intact. Faulty work shall be replaced for the full depth of treatment. It is the intent of this specification that the Contractor construct the plan depth

of cement treatment in one homogeneous mass.

9. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, Soil-Cement Base shall be measured by the square yard at each application rate specified. Measurement shall include, but not be limited to, furnishing, storing and applying cement; preparation of roadbed, application of cement, mixing, watering, compacting, finishing, curing and maintenance; and all other work as specified.

SECTION 025210  
LIME STABILIZATION (S-28)

1. DESCRIPTION

This specification shall consist of treating the subgrade, subbase or base by the pulverizing, addition of lime, mixing and compacting the mixed material to the required density. This specification applies to natural ground, embankment, existing pavement structure, or proposed base and shall be constructed as specified herein and in conformity with the typical sections, lines and grades as shown on the plans or as established by the Engineer.

2. Materials

- (1) The lime shall be a commercially produced "Hydrated Lime" in accordance with AASHTO M216 or Type A in accordance with TEX Item 264. The specifications apply specifically to the normal hydrate of lime made from "high-calcium" type limestone. Hydrated lime for stabilization purposes shall be applied as a slurry.
- (2) Lime to be used for the treated subgrade, existing subbase, existing base or proposed base is determined by preliminary tests and shall be applied at a rate indicated on the plans.

3. Equipment

The machinery, tools and equipment necessary for proper prosecution of the work shall be on the project and approved by the Engineer prior to the beginning of construction operations.

All machinery, tools and equipment used shall be maintained in a satisfactory and workmanlike manner.

Hydrated lime shall be stored and handled in closed weatherproof containers until immediately before distribution on the road. If storage bins are used, they shall be completely enclosed. Hydrated lime in bags shall be stored in weatherproof buildings with adequate protection from ground dampness. If lime is furnished in trucks, each truck shall have the weight of lime certified on public scales.

If lime is furnished in bags, each bag shall bear the manufacturer's certified weight. Bags varying more than 5 percent from that weight may be rejected and the average weight of bags in any shipment, as shown by weighing 50 bags taken at random, shall not be less than the manufacturer's certified weight.

4. Construction Methods

General - It is the primary requirement of this specification to secure a completed course of treated material containing a uniform lime mixture, free from loose or segregated areas, of uniform density and moisture content, well bound for its full depth and with a smooth surface suitable for placing subsequent courses. It shall be the responsibility of the Contractor to regulate the sequence of his work, to use the proper amount of lime, maintain the work and rework the courses as necessary to meet the above requirements.

Application - Lime shall be spread only on that area where the first mixing operations can be completed during the same working day.

Unless otherwise shown on drawings, lime shall be applied at a rate in pounds

of dry-hydrated lime per square yards, in the form of a slurry. Application rate may be varied by the engineer, if conditions warrant.

Certification of lime quantity and quality shall be provided as required to monitor the application. Certification should be in the form of weight tickets which indicate the actual weight of dry hydrated lime,  $CA(OH)_2$ .

The application and mixing of lime with the material shall be accomplished by the method hereinafter described.

The lime shall be mixed with water in trucks with approved distributors and applied as a thin water suspension or slurry.

Mixing - The mixing procedure shall be as hereinafter described.

- (a) **First Mixing:** The material and lime shall be thoroughly mixed by approved road mixers or other approved equipment, and the mixing continued until, in the opinion of the Engineer, a homogeneous, friable mixture of material and lime is obtained, free from all clods or lumps. Materials containing plastic clays or other material which will not readily mix with lime shall be mixed as thoroughly as possible at the time of the lime application, brought to the proper moisture content and left to cure 1 to 4 days as directed by the Engineer. During the curing period, the material shall be kept moist as directed.
- (b) **Final Mixing:** After the required curing time, the material shall be uniformly mixed by approved methods. If the soil binder-lime mixture contains clods, they shall be reduced in size by raking, blading, discing, harrowing, scarifying or the use of other approved pulverization methods so that, when all nonslaking aggregates retained on the No. 4 sieve are removed, the remainder of the material shall meet the following requirements when tested dry by laboratory sieves:

	<u>Percent</u>
Minimum Passing 1" Sieve .....	100
Minimum Passing No. 4 Sieve .....	85

Old bituminous wearing surface shall be pulverized so that 100% will pass a 20" sieve.

During the interval of time between applications and mixing, hydrated lime that has been exposed to the open air for a period of 6 hours or more or to excessive loss due to washing or blowing will not be accepted for payment.

Compaction - Compaction of the mixture shall begin immediately after final mixing and in no case later than 3 calendar days after final mixing, unless approval is obtained from the Engineer. The material shall be aerated or sprinkled as necessary to provide the optimum moisture. Compaction shall begin at the bottom and shall continue until the entire depth of mixture is uniformly compacted as hereinafter specified.

If the total thickness of the material to be treated cannot be mixed in one operation, the previously mixed material shall be bladed to a windrow just beyond the area to be treated and the next layer mixed with lime as previously specified. The first layer of the material shall be compacted in such a manner that the treated material will not be mixed with the underlying material.

The course shall be sprinkled as required to maintain moisture content on the wet side of optimum and compacted to the extent necessary to provide the



specified density. Unless shown otherwise on the drawings, all lime treated subgrades, subbases, and bases are not in direct contact with surface or binder course shall be compacted to a minimum of 98% standard proctor (AASHTO T99).

In addition to the requirements specified for density, the full depth of the material shown on the plans shall be compacted to the extent necessary to remain firm and stable under construction equipment. After each section is completed, tests as necessary will be made by the Engineer. If the material fails to meet the density requirements, it shall be reworked as necessary to meet these requirements.

Rework, when required to meet pulverization requirements or density, shall include the addition of lime, about 10% to 15% of the initial application rate or as deemed necessary by the Engineer. A new optimum density will be obtained.

Throughout this entire operation, the shape of the course shall be maintained by blading, and the surface, upon completion, shall be smooth and in conformity with the typical section shown on the plans and to the established lines and grades.

#### 5. Measurement & Payment

Unless indicated otherwise in the Proposal, Lime for stabilization of bases, subbases and subgrade shall be measured by the ton of dry hydrated lime applied.

Pulverizing, mixing, watering grading, compacting, working material etc., shall not be measured for pay but shall be subsidiary to other work.

SECTION 025213  
ASPHALT STABILIZED BASE (S-26)

1. DESCRIPTION

"Asphalt Stabilized Base" shall consist of base courses, subbase courses, or foundation courses to be composed of a compacted mixture of mineral aggregate and asphaltic material mixed hot in a mixing plant.

2. MATERIALS

- (a) Asphalt: Asphalt for the mixture shall be of the type and grade as determined by the Engineer and shall meet the requirements of Section 025404 entitled "Asphalts, Oils, and Emulsions".
- (b) Tack Coat: The asphaltic material for tack coat shall meet the requirements for emulsified asphalt EA-11M or shall be a cutback asphalt made by combining 50 to 70 percent by volume of the asphaltic material specified for the paving mixture with 30 to 50 percent by volume of gasoline or kerosene. Asphaltic materials shall meet the requirements of Section 025404 entitled "Asphalts, Oils, and Emulsions".
- (c) Mineral Aggregate: The material shall consist of durable coarse aggregate particles, crushed or uncrushed, with approved binding materials and screened as necessary to meet the following gradation requirements.

<u>Square Sieve Size</u>	<u>Percent Retained By Weight</u>
2" .....	0
1-1/4" .....	0-2
#4 .....	45-75
#40 .....	60-85

The mineral aggregate shall also meet the following physical requirements.

Wet Ball Mill .....	50 max.
Plasticity Index (P.I.) .....	15 max.
Liquid Limit (L.L.) .....	55 max.
Sand equivalent value shall not be less than 40	

Testing of mineral aggregates shall be in accordance with the appropriate Texas Highway Department standard laboratory test procedures.

3. MIXTURE

The mixture shall be uniform and shall contain 6.0 percent by weight of asphaltic material. Samples of the material, when tested, shall not vary from the designated asphalt content by more than 0.5 percent dry weight (based on total mixture).

4. EQUIPMENT

Equipment used in mixing, spreading, finishing, and compacting the material shall conform to the requirements of Section 025424 entitled "Hot Mix Asphaltic Concrete Pavement", Subsection 4 entitled "Equipment".

5. STOCKPILING, STORAGE, PROPORTIONING, AND MIXING

These requirements shall be as specified in Section 025424, Subsection 5.

6. CONSTRUCTION METHODS

Construction methods shall conform to the requirements of Section 025424, Subsection 6.

7. MEASUREMENT AND PAYMENT

Asphalt stabilized base shall be measured by the square yard. Payment shall be made at the contract unit bid price, per square yard, and shall constitute full compensation for all labor, material, equipment, and incidentals necessary to complete the asphalt stabilized base course in accordance with this specification and to the lines, grades, thickness, and typical section shown on the plans.

SECTION 025215  
CEMENT STABILIZED CALICHE BASE (S-47)

1. DESCRIPTION

This specification shall govern all work required to furnish and place all cement stabilized caliche base for this project.

2. MATERIALS

1. Raw Caliche Base: Sample for testing shall be taken prior to mixing with cement.

Material shall be well graded and meet the following requirements when tested in accordance with AASHTO T27:

Sieve Size	% Passing
2"	100
1"	75-95
3/8"	40-75
No. 4	30-60
No. 10	20-45
No. 40	15-30
No. 200	5-20

The material passing the No. 40 sieve, soil binder, shall meet the following requirements:

- a. Liquid limit shall not exceed 45 when tested in accordance with AASHTO T89.
- b. Plasticity index shall not exceed 20 when tested in accordance with AASHTO T90.
- c. Linear shrinkage shall not exceed 10 when tested in accordance with THD TEX-107-E. (Note: The linear shrinkage shall be calculated from the volumetric shrinkage at the liquid limit.)

Coarse aggregate shall have an abrasion loss of not more than 55% when subjected to the Los Angeles Abrasion Test, AASHTO T96.

2. Water: Water shall be free of substances deteriorative to curing of the treated base and shall be approved by the City Engineer.
3. Cement: Cement shall be Type 1 Portland Cement in accordance with ASTM C-150. Cement shall be applied in the amount necessary to produce the desired compressive strength in the finished and cured base, depending on raw caliche used. In most cases, acceptable raw caliche will require cement in the following amount:

Percent by Weight - 7  
lb. per sq. yd. for 1" depth - 5.57

In the absence of more precise data, the above amount has been used to estimate the quantity of Portland Cement in the proposal. The Engineer may increase or decrease the amount of cement at his discretion, after representative samples of the caliche have been tested.

4. Asphalt Seal: Asphalt Seal shall be MC70 in accordance with 025404.

### 3. EQUIPMENT

Equipment necessary for the proper construction of the work shall be on the project, in first-class working condition, and be approved by the Engineer, both as to type and condition, prior to the start of construction operations. The Contractor shall at all times provide sufficient equipment to enable continuous prosecution of the work and its completion in the required number of working days.

Portland Cement treatment for materials in place may be constructed with any machine or combination of machines and auxiliary equipment that will produce results as outlined in this specification.

Mixing may be accomplished by: (1) a multiple-pass traveling mixing plant or (2) a single-pass traveling mixing plant.

The equipment provided by the Contractor shall be operated by experienced and capable workmen and shall be that necessary to provide a cement treatment meeting the requirements herein specified.

### 4. CONSTRUCTION METHODS

#### 1. General:

It is the primary requirement of this specification to secure a complete course of treated material containing a uniform Portland cement mixture free from laminations or segregated areas, of uniform density and moisture content, well bound for its full depth and with a smooth surface suitable for placing subsequent courses. It shall be the responsibility of the Contractor to regulate the sequence of his work to process a sufficient quantity of material to provide full depth as shown on plans, to use the proper amount of Portland cement, maintain the work and rework the courses as necessary to meet the above requirements.

Cement treatment shall not be mixed or placed when the air temperature is below 40° and is falling, but may be mixed or placed when the air temperature is above 35° F and is rising, the temperature being taken in the shade and away from artificial heat and with the further provisions that cement treatment shall be mixed or placed only when weather conditions, in the opinion of the Engineer, are suitable.

#### 2. Test Section:

The Contractor shall be required to construct a "Test Section". The first section of cement treated base shall serve as a test section. Its length shall be between 300 and 500 linear feet, typically one block. Evaluation of the equipment and procedure will be done during this section. In case it is found that the work is not satisfactory with respect to the specification requirements, the Contractor shall revise his procedures and augment or replace equipment as necessary to assure work completed in accordance with the specifications. Additional test sections may be required as directed by the Engineer. Test sections not conforming to the requirements of the specifications shall be reconstructed.

#### 3. Placing of Base Material:

After approval of the previous course, base material shall be delivered on the road and placed in windows of uniform sections, then accurately bladed and shaped to required crown and grade to provide a base of compacted depth required by the plans.

4. Final Preparation of Section:

On the day immediately preceding processing, water, as required, shall be added and uniformly mixed full depth with the base material. This operation shall precede cement spreading by at least 12 hours. The section shall then be accurately bladed and shaped to required grade and section.

5. Application of Cement:

The specified quantity of Portland Cement required for the full depth of treatment shall be uniformly spread over the surface. Each pass of the cement spreader shall be positioned by either the curb line or a string line. Cement shall be applied only to such areas as can be completed as herein specified within the daylight hours of the same day. No equipment, except that used in spreading and mixing, will be allowed to pass over the freshly spread cement until it is mixed with the base material.

6. Mixing and Processing:

Either method (a) or (b) below may be used at the option of the Contractor.

- (a) Multiple-Pass Traveling Mixing Plant: After the cement has been applied, it shall be mixed with the base material. Mixing shall continue until the cement has been sufficiently blended with the base material to prevent the formation of cement balls when water is applied. Any mixture that has not been compacted and finished shall not remain undisturbed for more than 30 minutes.

Immediately after the mixing of base material and cement is completed, water, as necessary, shall be uniformly applied and incorporated into mixture. Proper care shall be exercised to insure proper moisture distribution at all times. After the last increment of water has been added, mixing shall continue until a thorough and uniform mix has been obtained.

- (b) Single-Pass Traveling Mixing Plant: After the cement has been applied, it shall be sufficiently mixed with the base material to prevent the formation of cement balls when water is applied. Unpulverized soil lumps in mixture will not be allowed. Should this condition prevail, the Contractor shall "pre-wet" the raw base material as necessary to correct this condition.

The mixer shall be provided with means for visible and accurately gauging the water application. The water shall be applied uniformly through a pressure spray bar. After cement is spread, mixing operations shall proceed as follows:

The mixer shall, in one continuous operation, mix the base material and cement full depth, add the required moisture uniformly, thoroughly moist-mix the material, cement, and water, spread the completed mixture evenly over the machine processed width of the subgrade, and leave it in a loose condition ready for immediate compaction.

The mixture shall not remain undisturbed, after mixing and before compacting, for more than 30 minutes.

7. Completion and Finishing:

The material shall be compacted to not less than 98 percent of the maximum dry density as determined by AASHTA T99 Method D. The moisture content of the mixture shall be within 3% of optimum on the wet side.

The surface, upon completion, shall be smooth and in conformity with typical sections and to the established lines and grades. Any deviation in excess of 1/4 inch in cross section and in a length of 16 feet measured longitudinally shall be corrected. All irregularity, depressions, or weak spots which develop shall be corrected by re-priming.

All sections of cement stabilized base shall be processed full width each day without longitudinal construction joints.

Any portion which has a density below that specified herein and which has not properly hardened after a suitable time interval shall be removed and replaced to meet this specification at the expense of the Contractor.

8. Asphalt Seal:

The compacted cement treated base course shall be protected against rapid drying by priming the surface in accordance with 025412. This curing seal shall be applied as soon as practicable, but not later than eight hours after the completion of final compaction. The surface shall be kept moist until the curing seal is applied. It shall be the responsibility of the Contractor to protect the primed surface until surface course is applied.

9. Traffic:

The Contractor shall not be permitted to drive heavy equipment over completed portions, but pneumatic-tired equipment required for hauling cement, and water may be permitted after the surface has hardened sufficiently to prevent the equipment from marring the surface, provided protection and cover specified herein are not impaired. The cement stabilized base may be opened to local traffic as soon as the asphalt seal has been applied and sanded or cured as necessary to prevent it from being picked up by traffic. It may be opened to all traffic after 7 days. Surface coarse shall be applied prior to opening to through traffic.

10. Maintenance:

The Contractor shall be required to maintain at his own expense the entire cement stabilized base within the limits of his contract in good condition satisfactory to the Engineer from the time he first starts work until all work shall have been completed.

Maintenance shall include immediate repairs of any defect that may occur after construction, which work shall be done by the Contractor at his own expense and repeated as often as necessary to keep the area continuously intact. Repairs are to be made in a manner to insure restoration of a uniform surface of good quality cement stabilized base. Faulty work shall be replaced for the full depth of base. Any low area shall be remedied by replacing the material for the full depth of treatment, rather than adding a thin layer of base material to the completed work.

5. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, Cement Stabilized Base will be measured by the square yard, complete in place, for the thickness specified on the plans. Areas will be measured separately for the various thicknesses of Cement Stabilized Base. Portland Cement, actually incorporated in the completed work, will be measured by the ton.



SECTION 025220

FLEXIBLE BASE - CHEMICALLY STABILIZED (S-24)

1. Description

This Specification shall govern all work for furnishing and placing Flexible Base - Chemically Stabilized required to complete the project.

2. Material

The material shall consist of Caliche, limestone, crushed stone, crushed gravel, Crushed Concrete, and sand, and shall be free of vegetation. The material shall be approved by the Engineer. All acceptable material shall be screened and the oversize shall be crushed and returned to the screened material in such a manner that a uniform product will be produced.

- Percentage
- (a) Gradation Limits (Before)
- |                            |       |
|----------------------------|-------|
| Passing 2" Sieve           | 100   |
| Passing 1" Sieve .....     | 75-95 |
| Passing 3/8" Sieve .....   | 40-75 |
| Passing No. 4 Sieve .....  | 30-60 |
| Passing No. 10 Sieve ..... | 20-45 |
| Passing No. 40 Sieve ..... | 15-30 |
- (b) A representative sample of the raw base material shall be slaked for twenty-four (24) hours and then the washed minus 40 material shall have:
- |                               |         |
|-------------------------------|---------|
| Liquid Limit (L.L.) .....     | 45 max. |
| Plasticity Index (P.I.) ..... | 16 max. |
- (c) A representative sample of the material shall be tested in accordance with ASTM C-131 for abrasion loss. The maximum loss shall not exceed 55%.
- (d) All "Flexible Base" shall be stabilized with lime or Portland Cement at a minimum application rate of 1.8 lb. of lime or Portland Cement per square yard for each 1" of in place thickness.
- (e) The stabilized material shall be tested in accordance with AASHTO T193 and the CBR shall not be less than 95 at a density of 100% (modified proctor) AASHTO T180, based on 140 degree curing for of the samples for 72 hours.

Lime or Portland Cement slurry for admix shall be 3.3 pounds minimum of Lime or Portland Cement per gallon of slurry. Lime shall conform to standard specification "Lime Stabilization", Section 025210.

Portland Cement shall be Type I in accordance with ASTM C150.

3. Testing

The City will engage a laboratory and pay for one test each gradation, L.L., P.I., and moisture-density relation, and necessary field densities. The Engineer may call for additional tests at any time. The cost of all retests, in case of failure to meet specifications, will be deducted from the Contractor's payment. The City will pay for proctor and soil constants and abrasion tests, with or without lime admix, at the rate of one test for each

1,500 square yards. If material changes and this ratio of tests increases, the Contractor shall pay the cost of additional tests required by the Engineer. The Engineer may waive testing and/or lime admix for small amounts for unimportant uses.

#### 4. Construction Methods

Prior to placement of base, the surface of the previous course shall be finished true to line and grade as established and in conformity with the typical section shown on the plans. Grade tolerance shall be generally 1/2 inch, and highs and lows must approximately balance.

Base shall be tested prior to placement.

Piles and windrows shall be broken down to the bottom and all nests of coarse or loose material shall be corrected.

Mix uniformly, prior to the addition of lime or Portland Cement. Slurry admix shall be spread at rate required and shall be placed only on that area where mixing can be completed that day. Material shall be mixed with pulverizing type mixer, so designed for this specific purpose, until mixed to the satisfaction of the Engineer.

Material shall be shaped and rolled after mixing and allowed to set at least 48 hours before compaction. Moisture content must be maintained in the material during the 48-hour period. Material shall be sprinkled or aerated to optimum moisture and compacted in layers (6 inches maximum loose) by approved power-drawn roller to uniform density of 95% modified proctor (AASHTO T180) on the wet side of optimum. Use mechanical tamps in areas inaccessible to rollers.

The surface of the compacted base shall be primed in accordance with Section 025412, after meeting moisture/density requirements.

On completion of compaction and priming, the surface shall be smooth and conform to lines, grades, and sections shown on the plans. Areas with any deviation in excess of 1/4 inch in cross-section and in lengths of 16 feet measured longitudinally shall be corrected by loosening, adding or removing materials, reshaping, and re-compacting by re-priming and rolling.

Moisture and density shall be maintained until the paving process is complete.

#### 5. Measurement and Payment

Unless indicated otherwise in the Proposal, Flexible Base - Chemically Stabilized shall be measured by the square yard. Payment includes all materials, royalty, hauling, labor and equipment to complete.

Lime or Portland Cement shall be measured by the ton and paid under other bid item, when included in the proposal.

Prime coat shall be measured by the gallon per square yard, when included in the proposal.

SECTION 025222  
FLEXIBLE BASE - HIGH STRENGTH (S-24A)

1. Description

This Specification shall govern all work for furnishing and placing Flexible Base - High Strength required to complete the project.

2. Material

The material shall consist of crushed Portland cement concrete, crushed asphalt concrete, crushed masonry, crushed gravel, crushed stone, and sand, and shall be free of vegetation. The material shall be approved by the Engineer. All acceptable material shall be screened and the oversize shall be crushed and returned to the screened material in such a manner that a uniform product will produced.

Percentage

(a) Gradation Limits (Before Compaction)

Passing 2" Sieve .....	100
Passing 1" Sieve .....	75-95
Passing 3/8" Sieve .....	40-75
Passing No. 4 Sieve .....	30-60
Passing No. 10 Sieve .....	20-45
Passing No. 40 Sieve .....	15-30

(b) A representative sample of the material shall be slaked for twenty-four (24) hours and then the washed minus 40 material shall have:

Liquid Limit (L.L.) .....	25 max.
Plasticity Index (P.I.) .....	10 max.

(c) A representative sample of the material shall be tested in accordance with ASTM C-131 for abrasion loss. The maximum loss shall not exceed 45%.

(d) A representative sample of material shall be tested in accordance with AASHTO T193 and the CBR shall not be less than 95 at a density of 100% (modified proctor) AASHTO T180.

3. Testing

The City will engage a laboratory and pay for one test each gradation, L.L., P.I., standard proctor, moisture-density relation, CBR, and necessary field densities. The Engineer may call for additional tests at any time. The cost of all retests, in case of failure to meet specifications, will be deducted from the Contractor's payment. The City will pay for proctor and soil constants and abrasion tests, at the rate of one test for each 1,500 square yards. If material changes and this ratio of one tests increase, the Contractor shall pay the cost of additional tests required by the Engineer.

4. Construction Methods

Prior to placement of base, the surface of the previous course shall be finished true to line and grade as established and in conformity with the typical section shown on the plans. Grade tolerance shall be generally  $\pm$  inch, and highs and lows must approximately balance.

Base shall be delivered and spread the same day if possible (no later than the next day).

Base shall be mixed as required to produce a uniform mixture with water. Base shall be placed in uniform lifts not to exceed 6" and compacted to a minimum of 95% of modified proctor, density AASHTO T180 at a moisture content of not less than 1% point below optimum moisture nor more than 3% points above optimum moisture.

The surface of the compacted base, after meeting moisture/density requirements, shall be primed in accordance with Section 025412.

On completion of compaction and priming, the surface shall be smooth and conform to lines, grades, and sections shown on the plans.

Moisture and density shall be maintained until the paving process is complete.

#### 5. Measurement and Payment

Unless indicated otherwise in the Proposal, Flexible Base - High Strength shall be measured by the square yard. Payment includes all materials, royalty, hauling, labor and equipment to complete.

Prime coat shall be measured by the gallon per square yard when included in the proposal.

SECTION 025224  
FLEXIBLE BASE - SHELL WITH SAND ADMIXTURE (S-25)

1. DESCRIPTION

"Flexible Base - Shell with Sand Admixture" shall consist of a foundation course for surface course or other base courses, shall be composed of shell and binder, and shall be constructed as herein specified in one or more courses in conformity with the typical sections shown on plans and to the lines and grades as established by the Engineer.

2. MATERIALS

- (1) Shell - Shell shall consist of durable particles of shell with or without its natural binder material and may be either washed, partially washed, or unwashed.
- (2) Sand - Sand shall consist of fine sand or sandy loam and shall be practically free from roots, grass, and other foreign materials.
- (3) Flexible Base - All materials shall be obtained from sources designated on the plans or approved by the Engineer. Both the shell and sand shall be of such quality that when properly proportioned and mixed a satisfactory flexible base material will be produced. Samples for testing shall be taken prior to the compaction operations.

The Contractor will be responsible for furnishing shell and sand which, when properly mixed, will produce a satisfactory uniform mixture of 60% shell and 40% sand.

3. GRADATION

The combined material shall conform to the following requirements:

Passing 1½ inch sieve ..... 90 - 100%  
Retained on No. 40 sieve ..... 45 - 65%

The material passing the NO. 40 sieve shall be known as soil binder and shall meet the following requirements:

The Liquid Limit shall not exceed ..... 35  
The Plasticity Index shall not exceed ..... 10

The Engineer may accept the material providing not more than 2 out of 10 consecutive gradation tests performed are outside the specified limit on any individual or combination of sieves by no more than 5% and where no two consecutive tests are outside the specified limit.

The Engineer may accept the material providing not more than 2 out of 10 consecutive plasticity index samples tested are outside the specified limit by no more than 2 points and where no two consecutive tests are outside the specified limit.

4. CONSTRUCTION METHODS

Immediately before placing the base material, the subgrade shall be checked as to conformity with grade and section. Grade tolerance shall be generally ½ inch, highs and lows must approximately balance.

A central mixing plan, or a road mixing machine, or a combination of machine shall be used to produce a uniform material meeting all of the requirements of this specification.

The base material shall be delivered and spread uniformly, sprinkled and compacted to 100% standard proctor density. In addition to the density requirement, the full depth of flexible base shown on the plans shall be compacted to the extent necessary to remain firm and stable under construction equipment. After each section of flexible base is completed, tests as necessary will be made by the Engineer. If the material fails to meet the density requirements, it shall be reworked as necessary to meet these requirements. Throughout this entire operation, the shape of the course shall be maintained by blading, and the surface, upon completion, shall be smooth and in conformity with the typical section shown on the plans and to the established lines and grades.

In that area on which pavement is to be placed, any deviation in excess of 1/4 inch in cross section and in a length of 16 feet measured longitudinally shall be corrected by loosening, adding or removing material, reshaping and re-compacting by sprinkling and rolling. All irregularities, depressions or weak spots which develop shall be corrected immediately by scarifying the areas affected, adding suitable material as required, reshaping and re-compacting by sprinkling and rolling. Should the base course, due to any reason or cause, lose the required stability, density and finish before the surfacing is complete, it shall be re-compacted and refinished at the sole expense of the Contractor.

#### 5. MEASUREMENT

Measurement shall be by the square yard in place of the combined shell and sand admixture or by the cubic yard in truckloads, whichever is specified in the bid.

#### 6. PAYMENT

The unit price bid for flexible base shall be full compensation for securing and furnishing all materials, including all royalty and freight involved, furnishing scales and labor involved in weighing the material when required, all processing and loading, hauling, labor, and equipment to complete.

SECTION 025402  
PLANING ASPHALTIC SURFACES (S-27A)

1. DESCRIPTION

This specification shall govern all work required for planing an existing asphaltic concrete pavement required to complete the project.

2. EQUIPMENT

Planer shall be a self propelled planing machine capable of removing, in one pass, a.c. surface to any required thickness less than 9 inches, in a minimum of 6-foot width. The planer shall be capable of accurately and automatically establishing profile grades along each edge of the machine by referencing from the existing pavement or curb and shall have an automatic system for controlling cross slope.

The machine shall be equipped with an integral loader to remove material being cut from the surface of the roadway and discharge the cuttings into a truck, all in one operation. Adequate back-up equipment (street sweepers, loaders, water trucks, etc.) and personnel will also be provided to minimize dust and remove all cuttings. The planer shall be equipped with means to control dust created by the cutting action and shall have a manual system providing for uniformly varying the depth of cut while the machine is in motion thereby making it possible to cut flush to all inlets, manholes, or other obstructions within the paved area.

Any machine that is incapable, in the opinion of the Engineer, of meeting these requirements will not be permitted to be used. Various machines may be permitted to make trial runs to demonstrate to the Engineer the capabilities of that machine.

3. CONSTRUCTION METHODS

The pavement surface shall be removed to the depth, width, grade and cross section as shown on the plans, or as directed by the Engineer.

The Engineer may require that the pavement planing operation be referenced from an independent grade control in those areas where he deems this type of control to be appropriate. For this type of operation, the independent grade control shall be established and maintained by the Contractor in a manner acceptable to the Engineer, and the final position of it shall be acceptable to the Engineer.

In the event the entire pavement width along a section of street has not been planed to a flush surface by the end of a work period resulting in a vertical or near vertical longitudinal face extending more than 1.25 inches in height, this longitudinal face shall be sloped in a manner acceptable to the Engineer so as not to create a hazard to traffic. Traverse faces that are present at the end of a work period shall be tapered in a manner approved by the Engineer to avoid creating a hazard for traffic.

The loose material resulting from the operation shall become property of the Contractor and disposed of by the Contractor in an acceptable manner.

When located adjacent to steep curbs, pavement that cannot be removed by the planing machine shall be removed by other methods acceptable to the Engineer and the pavement and curb surface shall be cleaned of all debris and left in a neat and presentable condition.

In planed areas where traffic is permitted, "Grooved Pavement Ahead" Signs shall be erected in advance of the planed areas. Signs shall be erected prior to planing in the areas and shall be maintained in place while the planed area is overlaid. Signs shall be in accordance with the "Texas Manual on Uniform Traffic Control Devices for Streets and Highways" and "Standard Highway Sign Designs for Texas".

In planed areas where traffic is permitted, a safe and satisfactory riding surface shall exist.

Unless otherwise shown on the plans or directed by the Engineer, the grade reference used by the Contractor may be of a type approved by the Engineer. Control points, if required by the plans or Engineer, will be established for the finished grade by the Engineer. These points will be set at intervals not to exceed 50 feet. The Contractor shall set the grade reference for the sensor of the automatic control to follow from the control points established by the Engineer, and this grade reference shall have sufficient support so that the maximum deflection shall not exceed 1/16 inch per 25 feet.

The planed surface shall be smooth and true to the established line, grade and section, When tested with a 10 foot straightedge placed parallel to the centerline of the roadway or tested by equivalent or acceptable means, except as provided herein, the maximum deviation shall not exceed 1/8 inch in 10 feet. Any point in the planed surface not meeting this requirement shall be corrected as directed by the Engineer.

#### 4. MEASUREMENT & PAYMENT

Unless indicated otherwise in the Proposal, Planning Asphalt shall be measured by the square yard of pavement surface area planed. Measurement will be made only one time for an area, regardless of the number of passes required to be made in order to achieve the desired results.

Payment will be made at unit price bid and shall include, but not be limited to, all planing, cleaning, loading, hauling, signs, labor, tools, equipment and incidentals required to complete the work.



SECTION 025404  
 ASPHALTS, OILS AND EMULSIONS (S-29)

1. DESCRIPTION

This specification shall govern all work for asphalt cement, cut-back asphalts, emulsified asphalts, other miscellaneous asphaltic materials and latex additives required to complete the project.

2. MATERIALS

When tested according to Texas Department of Transportation Test Methods, the various materials shall meet the applicable requirements of this specification.

(1) **ASPHALT CEMENT.** The asphalt cement shall be homogeneous, shall be free from water, shall not foam when heated to 347 F and shall meet the requirements in Table 1.

**TABLE 1**

Viscosity Grade	AC-1.5		AC-3		AC-5		AC-10		AC-20		AC-30	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Viscosity, 140 F, poises	100	200	250	350	400	600	800	1200	1600	2400	2400	3600
Viscosity, 275 F, poises	0.7	-	1.1	-	1.4	-	1.9	-	2.5	-	3.0	-
Penetration, 77 F, 100 g, 5 sec	250	-	210	-	135	-	85	-	55	-	45	-
Flash Point, C.O.C., F	425	-	425	-	425	-	450	-	450	-	450	-
Solubility in Trichloroethylene, %	99.0	-	99.0	-	99.0	-	99.0	-	99.0	-	99.0	-
Spot Test	Negative for all grades											
Tests on Residue from Thin Film Oven Test:												
Viscosity, 140 F, poises	-	450	-	900	-	1500	-	3000	-	6000	-	9000
Ductility, 77 F, 5 cm per min., cm	100*	-	100	-	100	-	100	-	70	-	50	-

\*If the ductility at 77 F is less than 100 cm, the material will be acceptable if its ductility at 60 F is more than 100 cm.

CAUTION: Heating of asphaltic materials (except emulsions) constitutes a fire hazard. Proper precautions should be used in all cases, especially with RC

cutbacks. The utmost care shall be taken to prevent open flames from coming in contact with the asphaltic material or the gases of same. The Contractor shall be responsible for damage from any fires or accidents which may result from heating the asphaltic materials.

**(2) LATEX MODIFIED ASPHALT.**

**(a) Latex Additive.** The latex additive shall be an emulsion of styrene-butadiene low-temperature copolymer in water. The emulsion shall have good storage stability and possess the following properties.

Monomer Ratio of Latex,	-	73 + 5
butadiene to styrene		----- 27 + 5
Minimum Solids Content, percent by weight	-	45
Viscosity of Emulsion at 77 + 1 F, cps, max (No. 3 spindle, 20 rpm, Brookfield RVT Viscometer)	-	2000

The manufacturer shall furnish the actual styrene-butadiene rubber (SBR) content for each batch of latex emulsion. This information shall accompany all shipments to facilitate proper addition rates.

**(b) Latex Modified Asphalt Cement.** The latex modified asphalt cement shall consist of an AC-5 or AC-10 asphalt cement in accordance with Subarticle 300.2 (1) to which a styrene-butadiene rubber latex has been added. The amount shown is based on latex solids in the finished asphalt cement-latex additive blend. Possible combinations and their intended uses are as follows:

	<u>Material</u>	<u>Use</u>
	AC-5 + 2% latex solids	Surface treatments
concrete	AC-10 + 2% latex solids	Surface treatments or asphaltic
	AC-10 + 3% latex solids	Asphaltic concrete
	AC-10 + 3% latex solids (High viscosity blend)	Asphaltic concrete where maximum high temperature toughness is needed.

The finished asphalt cement-latex additive blend shall be smooth, homogeneous, and comply with the requirements in Table 2.

TABLE 2

Type - Grade  Property	AC-5 + 2% Latex Solids	AC-10 + 2% Latex Solids	AC-10 + 3% Latex Solids	AC-10 + 3% Latex Solids (High Viscosity Blend)
Minimum SBR content, percent by wt. solids (IR determination)*	2.0	2.0	3.0	3.0
Penetration, 100g, 5 sec, 77 F, min	120	80	75	75
Viscosity, 140 F, poises, minimum	700	1300	1600	2300
Viscosity, 275 F, poises, maximum	7.0	8.0	12.0	12.0
Ductility, 39.2 F, 1cm/min, cm, minimum	-	-	100	100
Ductility, 39.2 F, 5 cm/min, cm, minimum	70	60	-	-
Separation of Polymer after 48 hrs. at 325 F	None	None	None	None
Separation of Polymer after 5 hrs. at 325 F **	None	None	None	None

\* The asphalt supplier shall furnish the Department samples of the asphalt cement and latex emulsion used in making the finished product.

\*\* Applies in lieu of the 48 hour requirement when the latex modified asphalt is to be used in asphaltic concrete and the latex additive is introduced separately at the mix plant, either by injection into the asphalt line or into the mixer.

(c) **Latex Modified Cutback Asphalt.** The latex modified cutback asphalt shall be a medium curing cutback produced from an asphalt cement to which has been added a styrene-butadiene rubber latex. The latex modified cutback asphalt shall comply with the requirements in Table 3.

TABLE 3

Type - Grade	MC-2400 Latex	
Property	Min	Max
Kinematic Viscosity @ 140 F, cst	2400	4800
Water, percent	-	0.2
Flash Point, T.O.C., F	150	-
Distillation Test:		
Distillate, percentage by volume of		
total distillate to 680 F		
to 500 F	-	35
to 600 F	35	80
Residue from Distillation, volume %	78	-
Tests on Distillation Residue:		
Minimum SBR Content percent by wt.		
solids (IR determination)*	2.0	-
Penetration, 100g, 5 sec., 77 F	150	300
Ductility, 5cm/min, 77 F, cm	50	-
Solubility in Trichloroethylene, %	99.0	-

\* The asphalt supplier shall furnish the Department samples of the asphalt cement and latex emulsion used in making the finished product.

(3) **CUTBACK ASPHALT.** Cutback asphalt shall meet the requirements indicated in Tables 4 and 5 for the specified type and grade.

TABLE 4  
RAPID CURING TYPE CUTBACK ASPHALT

Type - Grade	RC-250		RC-800		RC-3000	
Property	Min	Max	Min	Max	Min	Max
Kinematic Viscosity @ 140 F, cst	250	400	800	1600	3000	6000
Water, percent	-	0.2	-	0.2	-	0.2
Flash Point, T.O.C., F	80	-	80	-	80	-
Distillation Test:						
Distillate, percentage by volume of						
total distillate to 680 F						
to 437 F	40	75	35	70	20	55
to 500 F	65	90	55	85	45	75
to 600 F	85	-	80	-	70	-
Residue from distillation, volume %	70	-	75	-	82	-
Tests on Distillation Residue:						
Penetration, 100g, 5 sec., 77 F	80	120	80	120	80	120
Ductility, 5cm/min, 77 F, cm	100	-	100	-	100	-
Solubility in Trichloroethylene, %	99.0	-	99.0	-	99.0	-
Spot Test	Negative for all grades					

**CAUTION: R.C. CUTBACKS ARE EXTREMELY FLAMMABLE!**

TABLE 5  
MEDIUM CURING TYPE CUTBACK ASPHALT

Type - Grade	MC-30		MC-70		MC-250		MC-800		MC-3000	
Property	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Kinematic Viscosity @ 140 F, cst	30	60	70	140	250	500	800	1600	3000	6000
Water, percent	-	0.2	-	0.2	-	0.2	-	0.2	-	0.2
Flash Point, T.O.C., F	100	-	100	-	150	-	150	-	150	-
Distillation Test:										
Distillate, percentage by volume of										
total distillate to 680 F										
to 437 F	-	25	-	20	-	10	-	-	-	-
to 500 F	40	70	20	60	15	55	-	35	-	15
to 600 F	75	93	65	90	60	87	45	80	15	75
Residue from Distillation, volume %	50	-	55	-	67	-	75	-	80	-
Tests on Distillation Residue:										
Penetration, 100g, 5 sec., 77 F	120	250	120	250	120	250	120	250	120	250
Ductility, 5cm/min, 77 F, cm	100*	-	100*	-	100*	-	100*	-	100*	-
Solubility in Trichloroethylene, %	99.0	-	99.0	-	99.0	-	99.0	-	99.0	-
Spot Test	Negative for all grades									

\* If the penetration of residue is more than 200 and the ductility at 77 F is less than 100 cm, the material will be acceptable if its ductility at 60 F is more than 100.

(4) **EMULSIFIED ASPHALT.** Emulsified asphalt shall be homogeneous, shall show no separation of asphalt after thorough mixing and shall meet the requirements for the specified type and grade shown in Tables 6 through 9.

TABLE 6  
ANIONIC EMULSIONS

Type - Grade	Rapid Setting				Medium Setting		Slow Setting			
	RS-2		RS-2h		MS-2		SS-1		SS-1h	
Property	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Viscosity, Saybolt Furol at 77 F, sec	-	-	-	-	-	-	20	100	20	100
at 122 F, sec	150	400	150	400	100	300	-	-	-	-
Sieve Test, %	-	0.1 0	-	0.1 0	-	0.10	-	0.1 0	-	0.10
Miscibility (Standard Test)	-	-	-	-	-	-	Passing		Passing	
Cement Mixing, %	-	-	-	-	-	-	-	2.0	-	2.0
Demulsibility, 35 ml of 0.02 N CaCl <sub>2</sub> , %	60	-	60	-	-	30	-	-	-	-
Storage Stability, 1 day, %	-	1	-	1	-	1	-	1	-	1
Freezing Test, 3 cycles*	-	-	-	-	Passing		Passing		Passing	
Distillation Test:										
Residue by Distillation, % by weight	65	-	65	-	65	-	60	-	60	-
Oil Distillate, % by volume of emulsion	-	2	-	2	-	2	-	2	-	2
Tests on Residue from Distillation:										
Penetration at 77 F, 100 g, 5 sec	120	160	80	110	120	160	120	160	70	100
Solubility in Trichloroethylene, %	97.5	-	97.5	-	97.5	-	97.5	-	97.5	-
Ductility at 77 F, 5 cm/min, cm	100	-	80	-	100	-	100	-	80	-

\* Applies only when the Engineer designates material for winter use.

TABLE 7  
HIGH FLOAT ANIONIC EMULSIONS

Type - Grade	Rapid Setting		Medium Setting	
	HFRS - 2		AES - 300	
Property	Min	Max	Min	Max
Viscosity, Saybolt Furol				
at 77 F, sec	-	-	75	400
at 122 F, sec	150	400	-	-
Sieve Test, %	-	0.10	-	0.10
Coating Ability and Water Resistance:				
Coating, dry aggregate	-	-		good
Coating, after spraying	-	-		fair
Coating, wet aggregate	-	-		fair
Coating, after spraying	-	-		fair
Demulsibility 35 ml of 0.02 N CaCl <sub>2</sub> , %	50	-	-	-
Storage Stability Test, 1 day, %	-	1	-	1
Distillation Test:				
Residue by Distillation, % by weight	65	-	65	-
Oil Distillate, by volume of emulsion, %	-	2	-	5
Tests on Residue from Distillation:				
Penetration at 77 F, 100 g, 5 sec	100	140	300	-
Solubility in Trichloroethylene, %	97.5	-	97.5	-
Ductility at 77 F, 5 cm/min, cm	100	-	-	-
Float Test at 140 F, sec	1200	-	1200	-



TABLE 8  
CATIONIC EMULSIONS

Type - Grade	Rapid Setting				Medium Setting				Slow Setting			
	CRS-2		CRS-2h		CMS-2		CMS-2s		CSS-1		CSS-1h	
Property	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Viscosity, Saybolt Furol												
at 77 F, sec	-	-	-	-	-	-	-	-	20	100	20	100
at 122 F, sec	150	400	150	400	100	300	100	300	-	-	-	-
Sieve Test, %	-	0.1 0	-	0.1 0	-	0.1 0	-	0.1 0	-	0.1 0	-	0.1 0
Cement Mixing, %	-	-	-	-	-	-	-	-	-	2.0	-	2.0
Demulsibility, 35 ml 0.8 percent sodium dioctyl sulfosuccinate, %	40	-	40	-	-	-	-	-	-	-	-	-
Storage Stability, 1 day, %	-	1	-	1	-	1	-	1	-	1	-	1
Coating Ability and Water Resistance:												
Coating, dry aggregate	-	-	-	-	good		good		-	-	-	-
Coating, after spraying	-	-	-	-	fair		fair		-	-	-	-
Coating, wet aggregate	-	-	-	-	fair		fair		-	-	-	-
Coating, after spraying	-	-	-	-	fair		fair		-	-	-	-
Particle Charge Test	positive		positive		positive		positive		positive		positive	
Distillation Test:												
Residue by Distillation, % by wt	65	-	65	-	65	-	65	-	60	-	60	-
Oil Distillate, % by volume of emulsion	-	2	-	2	-	7	-	5	-	2	-	2
Tests on Residue from Distillation:												
Penetration at 77 F, 100 g, 5 sec	120	160	80	110	120	200	300	-	120	160	80	110
Solubility in Trichloroethylene, %	97.5	-	97.5	-	97.5	-	97.5	-	97.5	-	97.5	-
Ductility at 77 F, 5 cm/min, cm	100	-	80	-	100	-	-	-	100	-	80	-

TABLE 9

## POLYMER MODIFIED EMULSIONS

Type-Grade	High Float Anionic Rapid Setting		Cationic Rapid Setting	
	HFRS-2P		CRS-2P	
Property	Min	Max	Min	Max
Polymer Content, percent by weight of the				
distillation residue *	3.0	-	3.0	-
Viscosity, Saybolt Furol at 122 F, sec	150	400	150	400
Storage Stability Test, 1 day, %	-	1	-	1
Demulsibility, 35 ml of 0.02 N CaCl <sub>2</sub> , %	40	-	-	-
Demulsibility, 35 ml 0.8 percent sodium dioctyl sulfosuccinate, %	-	-	40	-
Sieve Test, %	-	0.10	-	0.10
Particle Charge Test		-		Positive
<b>**Distillation Test:</b>				
Oil distillate, by volume of emulsion, %	-	2	-	2
Residue, % by wt	65	-	65	-
<b>Tests on Residue from Distillation:</b>				
Float Value at 140 F, sec	1200	-	-	-
Penetration, 77 F, 100 g, 5 sec	100	140	110	150
Ductility, 39.2 F, 5 cm/min, cm	50	-	50	-
Viscosity at 140 F, poises	1500	-	1300	-
Solubility in Trichloroethylene, %	97	-	97	-

\* The emulsion supplier shall furnish the Department samples of the asphalt cement and polymer used in making the finished emulsion.

\*\* The temperature on the lower thermometer shall be brought slowly to 350 F plus or minus 10 F and maintained at this temperature for 20 minutes. The total distillation shall be completed in 60 plus or minus 5 minutes from the first application of heat.

(5) **FLUXING MATERIAL.** Fluxing material shall be free from foreign matter and shall be comprised of flux oil or a blend of flux oil and aromatic oil. The materials, when tested separately, shall meet the following requirements:

(a) **Flux Oil.**

Properties	Minimum	Maximum
Water, weight percent.....	-	0.2
Kinematic Viscosity, 140 F, cst.....	60	200
Flash Point, C.O.C., F.....	200	-
Loss on Heating, 50 g, 5 hrs at 325 F, ..... weight percent.....	-	10
Asphalt Content (100 to 200 Penetration residue by vacuum distillation), weight percent.....	25	-
Pour Point, F.....	-	60

(b) **Aromatic Oil.**

Properties	Minimum	Maximum
Water, weight percent.....	-	0.2
Kinematic Viscosity, 140 F, cst.....	-	150
Flash Point, C.O.C., F.....	250	-
Loss on Heating, 50 g, 5 hrs at 325 F, ..... weight percent.....	-	12
Pour Point, F.....	-	60

The aromatic oil, when blended with a maximum of 30 percent by weight of bitumen recovered from limestone ...rock asphalt by Test Method Tex-211-F, shall produce a material with a minimum penetration at 77 F of 85.

(6) **SPECIAL PRECOAT MATERIAL.** Special precoat material shall meet the following requirements:

Properties	Minimum	Maximum
Water, %.....	-	0.2
Flash Point, C.O.C., F.....	200	-
Kinematic Viscosity at 140 F, cst...	300	500
Distillation to 680 F:		
Initial Boiling Point, F.....	500	-
Residue by weight, %.....	70	-
Residue Penetration, 77 F, 100 g, 5 sec		200

9

(7) **CRACKED FUEL OIL.** Cracked fuel oil shall meet the following requirements:

Properties		
Minimum.....	Maximum	
Asphalt Content of 100 Penetration		
@ 77 F, %.....	65	80
Flash Point, C.O.C., F.....	250	-
Kinematic Viscosity at 140 F, cst...	-	550
Loss at 212 F, 20 g, 5 hrs. %.....	-	3.0
Water and Sediment, %.....	-	2.0

(8) **CRACK SEALER.** This section sets forth the requirements for SS-1P polymer modified emulsion .....suitable for sealing fine cracks, and a rubber asphalt compound suitable for sealing cracks 1/8 inch or greater width. For cracks on the order of 1/8 inch width, HFRS-2P polymer modified emulsion as described in Section (4), Table 9 of this item may be used. Requirements for SS-1P and rubber-asphalt crack sealing compound are as follows:

(a) **SS-1P Polymer Modified Emulsion.** Specific requirements are as follows:

Properties			
Minimum.....	Maximum		
Polymer Content, percent by weight of the distillate residue*.....	3.0	-	
Viscosity, Saybolt Furol at 77 F, sec		30	100
Storage Stability Test, one day, %..	-	1	
Cement Mixing, %.....	-	2.0	
Sieve Test, %.....	-	0.10	
Miscibility (Standard Test).....	Passing		

\*\* Distillation:

Oil distillate, by volume of emulsion, %		-	2
Residue, %.....	60	-	

Requirements on Residue from Distillation:

Penetration, 77 F, 100g, 5 sec.....	100	140
Ductility, 39.2 F, 5 cm/min, cm.....	50	-
Solubility in trichloroethylene, %..	97	-
Viscosity at 140 F, poises.....	1300	-

\* The emulsion supplier shall furnish the Department samples of the asphalt cement and polymer used in ..... making the finished emulsion.

\*\* The temperature on the lower thermometer shall be brought slowly to 350 F plus or minus 10 F and ..... maintained at this temperature for 20 minutes. The total distillation shall be completed in 60 plus or minus 5 minutes from the first application of heat.

**(b) Rubber-Asphalt Crack Sealing Compound.** This may be a proprietary material. The compound .....shall be capable of being melted and applied at a temperature of 400 F or less by a suitable oil jacketed kettle equipped with a pressure pump, a hose and a nozzle. It shall contain no water or highly-volatile matter. It shall not be tracked by traffic when cooled to road temperature.

The rubber-asphalt crack sealing compound shall meet the following requirements:

Properties			
	Minimum.....	.....	Maximum
Rubber Content, percent by wt.....	22		26
Flash Point, Modified C.O.C., F*....	400		-
Penetration at 77 F, 150 g, 5 sec **		30	50
Penetration at 32 F, 200 g, 60 sec **		12	-

\* The equipment and procedure shall be as specified in ASTM D 92 with the following modification. Prior to passing the test flame over the cup, agitate the sealing compound with a 3/8 inch to 2 inch wide square-end metal spatula in a manner so as to bring the material on the bottom of the cup to the surface, i.e., turn the material over. This shall be done, starting at one side of the thermometer, moving around to the other, then returning to the starting point, using 8 to 10 rapid circular strokes. The agitation shall be accomplished in 3 to 4 seconds. The test flame shall be passed over the cup immediately after the stirring is completed. This procedure shall be repeated at each successive 10 F interval until the flash point is reached.

\*\*The penetration shall be determined by ASTM D 5 except that the cone specified in ASTM D 217 shall be substituted for the penetration needle.

**Properties of Rubber Used in Sealer.** The rubber shall be one of the following types:

Type 1 - Ground tire rubber.

Type II - Mixture of ground tire rubber and high natural reclaimed scrap rubber. The natural rubber .....content, determined by ASTM D 297, shall be a minimum of 25 percent.

The ground rubber shall comply with the following gradation requirements when tested by Test Method Tex-200-F, Part 1.

U.S. Standard Sieve Size	Percent Retained	
	Type I	Type II
No. 8	0	-
No. 10	0-5	0
No. 30	90-100	50-70
No. 50	95-100	70-95
No. 100	-	95-100

The ground rubber shall be free from fabric, wire, cord or other contaminating materials.

**Packaging.** The rubber-asphalt crack sealing compound shall be packaged in boxes which contain two (2) 30-35 pound blocks that are individually packaged in a liner made of polyethylene, or other packaging approved by the Engineer.

**(9) ASPHALT RECYCLING AGENT.** The asphalt recycling agent shall be either a petroleum oil, referred to as recycling agent, or a petroleum oil emulsion, referred to as emulsified recycling agent. These agents may be used alone or the emulsified recycling agent may be used in conjunction with emulsified asphalt having the same particle charge, i.e., a cationic emulsified asphalt must be used with a cationic emulsified recycling agent and an anionic emulsified asphalt with an anionic emulsified recycling agent. The supplier must clearly state whether the emulsified recycling agent being furnished is cationic or anionic. Specific requirements are as follows:

**(a) Emulsified Recycling Agent.**

Properties	Minimum	Maximum
Viscosity, Saybolt Furol at 77 F, sec...	15	100
Sieve Test, %..... 0.10		-
Miscibility *.....		No Coagulation
Residue, % by wt. **.....	60	-
Test on Residue from Evaporation Test:		
Flash Point, C.O.C., F.....	400	-
Viscosity at 140 F, cst.....	75	250
Viscosity at 275 F, cst.....	-	10.0

\* Performed according to Test Method Tex-521-C except that 0.02 N calcium chloride solution shall be used in place of water.

\*\* Residue shall be determined by the evaporation method set forth in ASTM D 244, except that the sample shall be maintained at 300 F until foaming ceases, then cooled and weighed.

The ability of the residue from the evaporation test to restore the original properties of an aged asphalt cement shall be determined as follows. The residue shall be blended uniformly in the laboratory with a standard 14 to 16 penetration asphalt at a maximum rate of 20 percent by weight of the asphalt. The resulting blend must comply with all the requirements of Subarticle 300.2.(1) for AC-20 asphalt cement.

The standard asphalt cement for the above blend shall be obtained by subjecting an AC-20 produced by Fina Oil and Chemical, Big Spring, Texas, meeting all requirements of this Item, to the thin film oven test as specified in Test Method Tex-510-C except that the test period shall be increased so as to obtain the required penetration.

**(b) Recycling Agent.** When recycling agent (petroleum oil) is specified, it shall meet the same requirements indicated above for the Residue from Evaporation Test on emulsified recycling agent.

3. STORAGE, HEATING AND APPLICATION TEMPERATURES

Asphaltic materials should be applied at the temperature which provides proper and uniform distribution and within practical limits avoiding higher temperatures than necessary. Satisfactory application should usually be obtained within the recommended ranges shown below. No material shall be heated above the maximum temperatures shown in Table 10.

TABLE 10

TYPE - GRADE	Application		Storage Maximum, F
	Recommended Range, F	Maximum Allowable, F	
AC-1.5 and AC-3	220-300	350	350
AC-5, 10, 20, 30	275-350	375	400
AC-5 or AC-10 + 2% SBR	300-375	390*	375
AC-10 + 3% SBR	300-350	350	360
RC-250	125-180	200	200
RC-800	170-230	260	260
RC-3000	215-275	285	285
MC-30	70-150	175	175
MC-70	125-175	200	200
MC-250	125-210	240	240
MC-800	175-260	275	275
MC-3000 & MC-2400 Latex	225-275	290	290
SS-1, SS-1h, SS-1P, CSS-1, CSS-1h, recycling agent, emulsified recycling agent	50-130	140	140
RS-2, RS-2h, MS-2, CRS-2, CRS2h, CRS-2P, CMS-2, CMS-2s, HFRS-2, HFRS-2P, AES-300	110-160	170	170
Special Precoat Material	125-250	275	275
Flux Oil	-	275	275
Aromatic Oil	-	275	275
Cracked Fuel Oil	160-220	260	260
Rubber-Asphalt Crack Sealer	350-375	400	-

\*AC-5 + 2% SBR and AC-10 + 2% SBR which is designated for surface treatment work may be heated to a maximum temperature of 390 F by the supplier loading through an in-line heater, or, with the Engineer's permission, these materials may be heated to a maximum of 390 F by the Contractor just prior to application. When any of the SBR-modified asphalt cements are used in asphaltic concrete, the storage temperature at the mix plant should not exceed 350 F.

#### 4. MEASUREMENT AND PAYMENT

Asphalts, Oils, and Emulsions shall not be measured for payment, but shall be subsidiary to the appropriate bid item.

SECTION 025407  
ASPHALT RECYCLING IN PLACE (S-27)  
(Hot Recycle Method)

1. DESCRIPTION

This specification shall govern all work required for recycling and repaving the existing asphalt pavement required to complete the project. The system shall include heating, scarifying, remixing with rejuvenator, and reshaping an existing asphalt surface followed by subsequent addition of virgin HMAC overlay course, all done in a single multi-step process.

2. MATERIALS

**HOT MIX ASPHALT CONCRETE (HMAC)**, Unless indicated otherwise on the drawings, shall be Type 'D 'in accordance with Section 025424 of the Standard Specifications

**REJUVENATING AGENT** shall be RA1 or as shown in the drawings and in accordance with AASHTO M14-88 "Classifying Hot-Mix Recycling Agents".

**ABBREVIATED PAVEMENT MARKINGS**, unless indicated otherwise on the drawings, shall be in accordance with Section 025805 of the Standard Specifications.

3. EQUIPMENT

**The machine that heats, scarifies, rejuvenates and levels** must also lay the new hot-mix. New hot-mix must be laid within 30 seconds after scarification begins to ensure a Hot Monolithic Bond with the old pavement.

**RECYCLING/REPAVING UNIT** shall be a self-contained machine, specifically designed to accomplish the work as described above. Major components of the unit shall include heater, scarifier, gathering & mixing auger, mixing & spreading auger, and two vibratory screeds.

**HEATER** unit shall include an enclosed heating mechanism that is capable of sufficiently heating the pavement to allow scarification without braking aggregate; charring pavement; and polluting air.

**SCARIFYING** unit shall be equipped with automatic height adjustments and capable of uniformly scarifying the existing surface to a depth



of at least 1"

**REJUVENATOR APPLICATOR** shall be adjustable and capable of synchronizing application rate with machine speed.

**SCREEDS** shall be of the four section, heated, vibratory type.

#### 4. CONSTRUCTION METHODS

**EXISTING PAVEMENT** to be recycled shall be cleaned by the Contractor as required to have surface free of deleterious material during recycling.

**MANHOLE CLOVERS AND VALVE BOX** for sewers, water valves and gas valves shall be cross-referenced by the Contractor for adjustment to grade upon completion of overlay

**LONGITUDINAL SEAMS** shall have full thickness weld of recycled material with a minimum of 2-inch lap.

**HEATING** of existing pavement shall be done such that the pavement is evenly heated without differential burning or charring of asphalt. The heated material shall typically have a temperature between 235° to 285° F., when measured behind the heater scarifier.

**SCARIFICATION** of heated pavement shall be to a minimum average depth of 3/4", except for pavements immediately adjacent to manholes & valves.

**MIXING OF REJUVENATOR** with the scarified material shall be as required to provide a uniformly mixed material capable of having Hveem Stability in excess of 32% with a rejuvenator application rate of approximately .05 gal/yd<sup>3</sup>. Rejuvenator shall be applied without dilution, unless authorized otherwise by the Engineer.

**VIBRATORY SCREEDING** of recycled HMA shall follow as required to reshape the mixture to proper section and compact the recycled material to a minimum of 80% of Maximum Theoretical Density.

**NEW HMA** shall be placed over the Recycled HMA while the temperature of the Recycled HMA is still above 235° F. Unless specified otherwise on the drawings, the new HMA shall be Type 'D' in accordance with Section 025424 of the Standard Specifications and applied at a rate indicated on the drawings but not less than 80 Lb. Per Square Yard.

**VIBRATORY SCREEDING** of New HMAC shall follow as required to achieve proper section and compact the New HMAC to a minimum of 80% of maximum theoretical density.

**ROLLING/COMPACTION** shall follow as required to provide a uniformly compacted mixture with an average density of at least 92% of Maximum Theoretical Density, with no individual density less than 90% of Maximum Theoretical Density in accordance with THD Specs Tex-207-F and Tex-227-F.

**TEMPORARY PAVEMENT MARKINGS** shall be placed as soon as possible after paving operation, unless indicated otherwise on the Drawings. The Contractor shall remove temporary markings as required.

#### 5. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, **ASPHALT RECYCLING** shall be measured by the square yard of pavement surface recycled. Payment shall include heating, scarifying, mixing, shaping, recompacting and all other labor materials and incidentals necessary to accomplish the work.

Unless indicated otherwise in the Proposal, **REJUVENATION AGENT** shall be measured by the gallon of Rejuvenating Agent incorporated into the recycled pavement. Payment shall include furnishing and mixing of Rejuvenating Agent complete and in place.

Unless indicated otherwise in the Proposal, **HOT-MIX ASPHALT CONCRETE (HMAC)** SHALL BE measured by the ton of HMAC provided in place.

Unless indicated otherwise in the Proposal, **MANHOLE ADJUSTMENT AND WATER VALVE ADJUSTMENT** shall be subsidiary work and not measured for pay.

SECTION 025410  
ASPHALT CRACK SEALING (S-36)

1. DESCRIPTION

This item establishes the requirements for the performance of all work necessary for asphalt crack sealing.

2. MATERIALS

- 1) Asphalt Material - The asphalt material for crack sealing shall be RC-2 with one percent (1%) antistripping agent added as directed by the Engineers. The temperature range for the material shall be 125° - 200° F (51.7° - 93.3° C) when applied.
- 2) Aggregate for Blotting - "Buckshot Aggregate" or Sand shall be clean and dry and conform to the following gradation:

<u>Sieve Size</u>	<u>Percent Passing</u>
No. 4 (4.75 mm)	90 - 100
No. 10 (2.00 mm)	0 - 15

3. CONSTRUCTION METHOD

- 1) Cleaning - All cracks shall be thoroughly cleaned of undesirable material by the use of a 85 to 90 CFM (2.4 to 2.6 cubic meter per minute) (Minimum Size) air compressor with hoses and attachments.
- 2) Filling Procedure - After all cracks have been thoroughly cleaned, the operator of the hand hose shall apply hot liquid asphalt and then the blotting aggregate to the cleaned cracks. Application of the liquid asphalt and blotting aggregate shall be done in such a manner to avoid an accumulation of excess material on areas adjacent to the cracks. Excess material on the cracked areas shall be removed by means of a U - shaped squeegee.

4. MEASUREMENT & PAYMENT

Unless indicated otherwise in the Proposal, **ASPHALT CRACK SEALING** shall be measured by the square yard in place to the limits shown on the plans and as directed by the Engineer. The work shall include all labor, equipment and materials necessary to complete the work.

SECTION 025412  
PRIME COAT (S-30)  
(Asphalt Material Only)

1. DESCRIPTION

This specification shall consist of an application of asphalt material on the completed base course and/or other approved area in accordance with this specification.

Prime Coat shall not be applied when the air temperature is below 60°F and falling, but it may be applied when the air temperature is above 50°F and is rising, the air temperature being taken in the shade and away from artificial heat. Asphalt material shall not be placed when general weather conditions, in the opinion of the Engineer, are not suitable.

2. MATERIALS

The asphalt material used for the prime coat shall be MC-70, unless otherwise specified, and when tested by approved laboratory methods shall meet the requirements of the specification 025404 - Asphalts, Oils and Emulsions.

3. CONSTRUCTION METHODS

When, in the opinion of the Engineer, the area and/or base is satisfactory to receive the prime coat, the surface may be cleaned by sweeping or other approved methods. If found necessary by the Engineer, the surface shall be lightly sprinkled just prior to application of the asphalt material. The asphalt material shall be applied on the clean surface by an approved type of self-propelled pressure distributor so operated as to distribute the material in the quantity specified, evenly and smoothly under a pressure necessary for proper distribution. The Contractor shall provide all necessary facilities for determining the temperature of the asphalt material in all of the heating equipment and in the distributor, for determining the rate at which it is applied, and for securing uniformity at the junction of two distributor loads.

All storage tanks, piping, retorts, booster tanks and distributors used in storing or handling asphalt material shall be kept clean and in good operating condition at all times, and they shall be operated in such manner that there will be no contamination of the asphalt material with foreign material. It shall be the responsibility of the Contractor to provide and maintain in good working order a recording thermometer at the storage-heating unit at all times.

The distributor shall have been recently calibrated and the Engineer shall be furnished an accurate and satisfactory record of such calibration. After beginning of the work, should the yield on the asphalt material applied appear to be in error, the distributor shall be calibrated in a manner satisfactory to the Engineer before proceeding with the work.

Prime shall be applied at a temperature within the recommended range per Standard Specification 025404 "Asphalts, Oils, and Emulsions with that range being 125 to 175 °F for MC-70. Application rate shall be 0.15 GAL/SY, unless otherwise specified.

The Contractor shall be responsible for the maintenance of the surface until the Engineer accepts the work.

No traffic hauling or placement of any subsequent courses shall be permitted over the freshly applied prime coat until authorized by the Engineer.

#### 4. MEASUREMENT & PAYMENT

Unless indicated otherwise in the Proposal, PRIME COAT shall be measured by the gallon of prime applied. Payment shall include furnishing, heating, hauling and distributing the asphalt material as specified; for all freight involved; and for all manipulation, labor, tools, equipment and incidentals necessary to complete the work.

SECTION 025414  
AGGREGATE FOR SURFACE TREATMENT AND SEAL COATS (S-35)

1. DESCRIPTION

This specification establishes the requirements for aggregate, lightweight aggregate, and precoated to be used in the construction of surface treatments and seal coats. The type of aggregate shall be as specified in the applicable specification.

2. AGGREGATE

- (1) Materials. Aggregates shall be composed of clean, tough and durable particles of gravel, crushed gravel, crushed stone, crushed slag or natural limestone rock asphalt. These materials shall not contain more than 5 percent by weight of soft particles and other deleterious materials as determined by Test Method Tex-217-F, Part I.

The natural limestone rock asphalt aggregate furnished shall have an average bitumen content from 4 to 8 percent by weight of naturally impregnated asphalt, as determined by Test Method Tex-215-F, and shall not contain not more than 2 percent by weight of any one of or combination of iron pyrites, or other objectionable matter, as determined by Test Method Tex-217-F, Part I.

No aggregate shall contain a total of more than 5 percent by weight of impurities or objectionable matter listed above.

The percent of wear, as determined by Test Method Tex-410-A, for each of the materials shall not exceed 35 percent.

The percent of wear on natural limestone rock asphalt aggregate as determined by Test Method Tex-410-A shall be made on that portion of the material retained on the NO. 4 sieve, having a naturally impregnated asphalt content of less than 1 percent.

Crushed gravel shall have a minimum of 85 percent of the particles retained on the NO. 4 sieve with at least one crushed face, as determined by Test Method Tex-1413-A.

- (2) Types. The various types of aggregates are identified as follows:

- Type A. Type A aggregate shall consist of gravel, crushed slag, crushed stone or natural limestone rock asphalt.
- Type B. Type B aggregate shall consist of crushed gravel, crushed slag, crushed stone or natural limestone rock asphalt.
- Type C. Type C. aggregate shall consist of gravel, crushed slag or crushed stone.
- Type D. Type D aggregate shall consist of crushed gravel, crushed slag or crushed stone.
- Type E. Type E aggregate shall consist of natural limestone rock asphalt.

- (3) Grades: When tested by Test Method Tex-200-F, Part I, the gradation requirements for the several grades of aggregate shall be as follows:

<u>(a) Class A</u>		<u>Percent by weight</u>
Grade 1:	Retained on 7/8" sieve	0
	Retained on 3/4" sieve	0 - 5
	Retained on 5/8" sieve	85 - 100
	Retained on 3/8" sieve	95 - 100
	Retained on No. 10 sieve	99 - 100
Grade 2:	Retained on 3/4" sieve	0
	Retained on 5/8" sieve	0 - 5
	Retained on 1/2" sieve	85 - 100
	Retained on 3/8" sieve	95 - 100
	Retained on 1/4" sieve	99 - 100
	Retained on No. 10 sieve	99 - 100
Grade 3:	Retained on 5/8" sieve	0
	Retained on 1/2" sieve	0 - 5
	Retained on 3/8" sieve	85 - 100
	Retained on 1/4" sieve	95 - 100
	Retained on No. 10 sieve	95 - 100
Grade 4:	Retained on 1/2" sieve	0
	Retained on 3/8" sieve	0 - 5
	Retained on 1/4" sieve	95 - 100
	Retained on No. 10 sieve	99 - 100
Grade 5:	Retained on 3/8" sieve	0
	Retained on 1/4" sieve	0 - 5
	Retained on No. 4 sieve	50 - 100
	Retained on No. 10 sieve	99 - 100

<u>(b) Class B</u>		<u>Percent by Weight</u>
Grade 1:	Retained on 1" sieve	0
	Retained on 7/8" sieve	0 - 2
	Retained on 3/4" sieve	20 - 35
	Retained on 5/8" sieve	85 - 100
	Retained on 3/8" sieve	95 - 100
	Retained on No. 10 sieve	99 - 100

<u>(b) Class B</u>		<u>Percent by Weight</u>
Grade 2:	Retained on 7/8" sieve	0
	Retained on 3/4" sieve	0 - 2
	Retained on 5/8" sieve	20 - 35
	Retained on 1/2" sieve	85 - 100
	Retained on 3/8" sieve	95 - 100
	Retained on No. 10 sieve	99 - 100
Grade 3:	Retained on 3/4" sieve	0
	Retained on 5/8" sieve	0 - 2
	Retained on 1/2" sieve	20 - 35
	Retained on 3/8" sieve	85 - 100
	Retained on 1/4" sieve	95 - 100
	Retained on No. 10 sieve	99 - 100

Grade 4:	Retained on 5/8" sieve	0
	Retained on 1/2" sieve	0 - 2
	Retained on 3/8" sieve	20 - 35
	Retained on No. 4 sieve	95 - 100
	Retained on No. 10 sieve	99 - 100
Grade 5:	Retained on 3/8" sieve	0
	Retained on 1/4" sieve	0 - 5
	Retained on No. 10 sieve	99 - 100

The aggregate shall not contain more than 1.0 percent by weight of fine dust, clay-like particles and/or silt present when tested in accordance with Test Method Tex-217-F, Part II.

### 3. LIGHTWEIGHT AGGREGATE

(1) Materials. Aggregate shall be composed predominately of lightweight cellular and granular inorganic materials produced by fuzing raw shale or clay in a rotary kiln under intense heat into predominantly amorphous silicate. All aggregate for use on this project shall be produced from the same plant and source.

The dry loose unit weight of coarse lightweight aggregates shall not be less than 35 and shall not exceed 55 pounds per cubic foot unless otherwise specified on the plans. If the unit weight of any shipment of lightweight aggregate differs by more than 4 percent from that of the sample submitted for acceptance tests, the aggregate in the shipment may be rejected. Tests shall be in accordance with Test Method Tex-410-A, Part C. The percent of wear, as determined by Test Method Tex-410-A shall not exceed 35 percent.

The Aggregate Freeze Thaw Loss shall not exceed 7 percent when tested in accordance with Texas Test Method Tex-432-A (Tentative).

The Pressure Slaking Value shall not exceed 4 percent when tested in accordance with Test Method Tex-431-A, (Tentative).

(2) Grades. When tested by Test Method Tex-200-F, Part I, and the gradation requirements for the several grades of aggregate shall be as follows:

		<u>Percent by Weight</u>
Grade 3:	Retained on 3/4" sieve	0
	Retained on 5/8" sieve	0 - 5
	Retained on 1/2" sieve	30 - 50
	Retained on 3/8" sieve	85 - 100
	Retained on 1/4" sieve	95 - 100
	Retained on No. 10 sieve	98 - 100
Grade 4:	Retained on 5/8" sieve	0
	Retained on 1/2" sieve	0 - 5
	Retained on 3/8" sieve	20 - 40
	Retained on No. 4 sieve	95 - 100
	Retained on No. 10 sieve	98 - 100
Grade 5:	Retained on 1/2" sieve	0
	Retained on 3/8" sieve	0 - 2
	Retained on No. 4 sieve	60 - 80
	Retained on No. 10 sieve	98 - 100



The aggregate shall not contain more than 1.0 percent by weight of fine dust, clay-like particles and/or silt present when tested in accordance with Test Method Tex-217-F, Part II.

#### 4. PRECOATED AGGREGATES

Precoated aggregate shall be aggregates of the type specified, treated (coated or fluxed) with 0.5 to 1.5 percent by weight of precoat material of flux oil meeting the requirements of this specification and the approval of the Engineer. The particular grade of precoated aggregate specified shall meet all requirements of Section 025414.3 (2) prior to the application of the precoat material.

(1) Water in a amount not to exceed 3 percent by weight of the mixture may be used in preparing the mixture. The water shall be added as directed by the Engineer during the mixing. In the event water is used in the mixing operation adequate measuring devices shall be used and the water shall be administrative to the mix through as approved spray bar.

(2) Physical Properties of the Mixture. The materials may be mixed on the job or at some central mixing plant and shipped ready for use. Mixes that do not remain workable a sufficient period of time or maintain flow qualities such that the precoated aggregate may be satisfactorily spread by normal approved mechanical spreading devices will not be acceptable.

Materials that are not uniformly and/or property coated or fluxed, as determined by the Department's standard testing procedures or in the opinion of the Engineer, will not be accepted for use.

(3) Materials. Aggregate for precoated aggregate shall be the same as specified in Section 025414.2 (1).

The precoat material shall meet the requirements for "Precoated Materials" as specified in the specification, Section 025404 "Asphalts, Oils and Emulsions".

The flux oil shall meet the requirement for "Flux Oil" as specified in the specification, Section 025404 "Asphalt, Oils and Emulsions".

(4) Types. The various types of precoated aggregates are identified as follows:

Type PA: Type PA shall be precoated aggregate consisting of crushed gravel, crushed slag, crushed stone or natural limestone rock asphalt.

Type PB: Type PB shall be precoated aggregate consisting of crushed gravel, crushed slag, crushed stone or natural limestone rock asphalt.

Type PC: Type PC shall be precoated aggregate consisting of gravel, crushed slag or crushed stone.

Type PD: Type PD shall be precoated aggregate consisting of crushed gravel, crushed slag or crushed stone.

Type PE: Type PE shall be precoated aggregate consisting of natural limestone rock asphalt.

- (5) Grades. When tested by Test Method Tex-200-F, Part I, and the gradation requirements for the several grades of aggregate shall be as follows:

<u>(a) Class A</u>		<u>Percent by weight</u>
Grade 1:	Retained on 7/8" sieve	0
	Retained on 3/4" sieve	0 - 5
	Retained on 5/8" sieve	85 - 100
	Retained on 3/8" sieve	95 - 100
	Retained on No. 10 sieve	99 - 100
Grade 2:	Retained on 3/4" sieve	0
	Retained on 5/8" sieve	0 - 5
	Retained on 1/2" sieve	85 - 100
	Retained on 3/8" sieve	95 - 100
	Retained on 1/4" sieve	99 - 100
	Retained on No. 10 sieve	99 - 100
Grade 3:	Retained on 5/8" sieve	0
	Retained on 1/2" sieve	0 - 5
	Retained on 3/8" sieve	85 - 100
	Retained on 1/4" sieve	95 - 100
	Retained on No. 10 sieve	95 - 100
Grade 4:	Retained on 1/2" sieve	0
	Retained on 3/8" sieve	0 - 5
	Retained on 1/4" sieve	95 - 100
	Retained on No.10 sieve	99 - 100
Grade 5:	Retained on 3/8" sieve	0
	Retained on 1/4" sieve	0 - 5
	Retained on No. 4 sieve	50 - 100
	Retained on No. 10 sieve	99 - 100

<u>(b) Class B</u>		<u>Percent by Weight</u>
Grade 1:	Retained on 1" sieve	0
	Retained on 7/8" sieve	0 - 2
	Retained on 3/4" sieve	20 - 35
	Retained on 5/8" sieve	85 - 100
	Retained on 3/8" sieve	95 - 100
	Retained on No. 10 sieve	99 - 100
Grade 2:	Retained on 7/8" sieve	0
	Retained on 3/4" sieve	0 - 2
	Retained on 5/8" sieve	20 - 35
	Retained on 1/2" sieve	85 - 100
	Retained on 3/8" sieve	95 - 100
	Retained on No. 10 sieve	99 - 100
Grade 3:	Retained on 3/4" sieve	0
	Retained on 5/8" sieve	0 - 2
	Retained on 1/2" sieve	20 - 35
	Retained on 3/8" sieve	85 - 100
	Retained on 1/4" sieve	95 - 100
	Retained on No. 10 sieve	99 - 100

Class "B" Percent by

		<u>Weight</u>
Grade 4:	Retained on 5/8" sieve	0
	Retained on 1/2" sieve	0 - 2
	Retained on 3/8" sieve	20 - 35
	Retained on No. 4 sieve	95 - 100
	Retained on No. 10 sieve	99 - 100
Grade 5:	Retained on 3/8" sieve	0
	Retained on 1/4" sieve	0 - 5
	Retained on No. 10 sieve	99 - 100

The aggregate shall not contain more than 1.0 percent by weight of fine dust, clay-like particles and/or silt present when tested in accordance with Test Method Tex-217-F, Part II.

#### 5. LIGHTWEIGHT AGGREGATE

- (1) Materials. Aggregate shall be composed predominately of lightweight cellular and granular inorganic materials produced by fuzing raw shale or clay in a rotary kiln under intense heat into predominantly amorphous silicate. All aggregate for use on this project shall be produced from the same plant and source.

The dry loose unit weight of coarse lightweight aggregates shall not be less than 35 and shall not exceed 55 pounds per cubic foot unless otherwise specified on the plans. If the unit weight of any shipment of lightweight aggregate differs by more than 4 percent from that of the sample submitted for acceptance tests, the aggregate in the shipment may be rejected. Tests shall be in accordance with Test Method Tex-410-A, Part C. The percent of wear, as determined by Test Method Tex-410-A shall not exceed 35 percent.

The Aggregate Freeze Thaw Loss shall not exceed 7 percent when tested in accordance with Texas Test Method Tex-432-A (Tentative).

The Pressure Slaking Value shall not exceed 4 percent when tested in accordance with Test Method Tex-431-A, (Tentative).

- (2) Grades. When tested by Test Method Tex 200-F, Part I, the gradation requirements for the several grades of aggregate shall be as follows:

		<u>Percent by Weight</u>
Grade 3:	Retained on 3/4" sieve	0
	Retained on 5/8" sieve	0 - 5
	Retained on 1/2" sieve	30 - 50
	Retained on 3/8" sieve	85 - 100
	Retained on 1/4" sieve	95 - 100
	Retained on No. 10 sieve	98 - 100
Grade 4:	Retained on 5/8" sieve	0
	Retained on 1/2" sieve	0 - 5
	Retained on 3/8" sieve	20 - 40
	Retained on No. 4 sieve	95 - 100
	Retained on No. 10 sieve	98 - 100

Grade 5:	Retained on 1/2" sieve	0
	Retained on 3/8" sieve	0 - 2
	Retained on No. 4 sieve	60 - 80
	Retained on No. 10 sieve	98- 100

The aggregate shall not contain more than 1.0 percent by weight of fine dust, clay-like particles and/or silt present when tested in accordance with Test Method Tex-217-F, Part II.

(6) Equipment.

- A. Mixing Plants. Mixing plants that will not continuously meet all the requirements of this specification shall be condemned.

Mixing plant may be either the weight-batching type or the continuous mixing type. Both types of plants shall be equipped with satisfactory conveyors, power units, aggregate handling equipment, aggregate screens and bins and shall consist of the following essentials pieces of equipment:

(1) Weigh-batching Type

Cold aggregate Bin and Proportioning Device. The cold aggregate bins or aggregate stockpiles shall be of sufficient number and size to supply the amount of aggregate required to keep the plant in continuous operation. The proportioning device shall be such as will provide a uniform and continuous flow of aggregate in the desired proportion to the plant.

Dryer. The dryer shall be of the type that continually agitates the aggregate during heating and in which the temperature can be so controlled that aggregate will not be injured in the necessary drying and heating operations required to obtain a mixture of the specified temperature.

The burner, or combination of burners, the type of fuel used shall be such that in the process of heating the aggregate to the desired or specified temperatures, no residue from the fuel shall adhere to the heated aggregate. A recording thermometer shall be provided which will record the temperature of the aggregate when it leaves the dryer. The dryer shall be of sufficient size to keep the plant in continuous operation. The dryer will not be required for precoating natural limestone rock asphalt.

Screening and Proportioning The screening capacity and size of the bins shall be sufficient to screen and store the amount of aggregate required to properly operate the plant and keep the plant in continuous operation at full capacity. Proper provisions shall be made to enable inspection forces to have easy and safe access to the proper location on the mixing plant where accurate representative samples of aggregate may be taken from bins for testing.

Weighing and Measuring Equipment. The weighing and measuring equipment shall be of sufficient capacity and of adequate design for proper batching. The following equipment shall be furnished:

1. Aggregate weigh box and batching scales.
2. Bucket and scales for precoat material or flux oil.

A pressure type flow meter may be used to measure the precoat material or flux oil for each batch.

Mixer. The mixer shall be of the pug mill type, and shall have a capacity of not less than 3000 pounds in a single batch. The number of blades circulation bar

that will distribute the precoat material or flux oil quickly and uniformly throughout the mixer. Any mixer that has a tendency to segregate the mineral aggregate or fails to secure a thorough and uniform mixing with the precoat material or flux oil shall not be used. All mixers shall be provided with an automatic time lock that will lock the discharge doors of the mixer for the required mixing period. The dump doors or doors and the shaft seals of the mixer shall be tight enough to prevent the spilling of aggregate or mixture from the pug mill.

(2) Continuous Mixing Type

Cold Aggregate Bin and Proportioning Device. Same as for weight-batching type of plant.

Dryer. Same as for weight-batching type of plant.

Screening and Proportioning. Same as for weight-batching type of plant. These requirements shall also apply to materials that are stockpiled and that are proposed for direct use by a continuous mixing plant without the use of plant bins.

Aggregate Proportioning Device. The aggregate proportioning device shall be so designed that when properly operated a uniform and continuous flow of aggregate into the mixer will be maintained.

Spray Bar for Precoat Materials and Flux Oil. The spray bar the precoat material or flux oil shall be so designed that the material will spray uniformly and continuously into the mixer.

Meter for Precoat Materials and Flux Oil. An accurate recording meter for precoat material or flux oil shall be placed in the line leading to the spray bar so that the accumulative amount of precoat material or flux oil being used can be accurately determined. Provisions of a permanent nature shall be made for checking the accuracy of the meter output.

Mixer. The mixer shall be of the pug mill continuous type and shall have a capacity of not less than 40 tons of mixture per hour. Any mixer that has a tendency to segregate the aggregate or fails to secure a thorough and uniform mixing of the aggregate with the precoat material or flux oil shall not be used.

Heating Equipment for Precoat Material and Flux Oil. Heating equipment for precoat material and flux oil shall be adequate to heat the amount of material required to the desired temperature. The material may be heated by steam coils that shall be absolutely tight. Direct fire heating will be permitted, provided the heater used is manufactured by a reputable concern and there is positive circulation of the liquid throughout the heater. Agitation with steam or air will not be permitted. The heating apparatus shall be equipped with a recording thermometer with a 24-hour chart that will record the temperature of the precoat material or flux oil where it is at the highest temperature.

(7) Storage, Proportions and Mixing

A. Aggregate Storage. If the mineral aggregates are stored or stockpiled, they shall be handled in such a manner as to prevent segregation, the mixing of the various materials or sizes, and the contamination with foreign materials. The grading of aggregates proposed for use and as supplies to the mixing plant shall be uniform.

The use of limestone rock asphalt aggregate containing moisture in excess of the saturated surface-dry condition will not be permitted. Excess moisture will be evidenced by visual surface moisture on the aggregate or any unusual quantities

of fines clinging to the aggregate.

B. Storage and Heating of Precoat or Flux Oil. The precoating or fluxing material storage shall be sampled to meet the requirements of the plant. The materials shall not be heated to a temperature in excess of 250° F. All equipment used in the storage and handling of precoat material or flux oil shall be kept in a clean condition at all times and shall be operated in such manner that there will be no contamination with foreign matter.

C. Feeding and Drying of Aggregate. The feeding of various sizes of aggregate, other than natural limestone rock asphalt, to the dryer shall be done through the cold aggregate bin and proportioning device in such a manner that a uniform and constant flow of material in the required proportions will be maintained. The aggregate heated to the temperature necessary to produce a mixture meeting the requirements of Subarticle Section 025414.4 (2), "Physical Properties of the Mixture".

D. Proportioning. The proportioning of the various materials entering into the mixture shall be as directed by the Engineer and in accordance with these specifications. Aggregate shall be proportioned by weight using the weight box and batching scales herein specified when the weight-batch type of plant is used and by volume using the aggregate proportioning devices when the continuous mixer type of plant is used. The precoat material or flux oil shall be proportioned by weight or by volume based on weight using the specified equipment.

E. Mixing.

(1) Batch Type Mixer. In the charging of the weigh box and in the charging of the mixer from the weigh box, such methods or devices shall be used as are necessary to secure a uniform mixture. In introduce the batch into the mixer, the mineral aggregate shall be introduced first; shall be mixed thoroughly, as directed, to uniformly distribute the various sizes throughout the batch before the precoat material or flux oil is added; the precoat material or flux oil shall then be added and the mixing continued until such time that the aggregate is properly coated. This mixing period may be varied, if in the opinion of the Engineer, the mixture is not uniform.

(2) Continuous Type Mixer. The amount of aggregate and precoat material or flux oil entering the mixer and the rate of travel through specified grading and percent by weight of precoat material or flux oil will be produced.

## 6. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, AGGERATE FOR SURFACE TREATMENT AND SEAL COATS, shall be subsidiary to construction in which these materials are used.

SECTION 025416  
SEAL COAT (S-31)

1. DESCRIPTION

This specification shall consist of a surface treatment composed of a single application of asphalt covered with aggregate for the sealing of existing pavements in accordance with this specification.

Seal coats shall not be applied when the air temperature is below 60°F and is falling, but may be applied when the air temperature is above 50°F and is rising, the air temperature being taken in the shade and away from artificial heat. Asphaltic material shall not be placed when general weather conditions, in the opinion of the Engineer, are not suitable.

2. MATERIALS

(1) Asphaltic Materials. The asphaltic material used shall be AC-5 (Ac-3 in winter) or other approved material as prescribed in the specification, Section 025404 "Asphalts, Oils and Emulsions", whichever is called for on the plans.

(2) Aggregate

**Single Course** - The aggregate used shall be Class A, Type A, (Type PA for precoated aggregate), Grade 4 as described in specification Section 025414 "Aggregate For Surface Treatments and Seal Coats".

**Multiple Course** - The aggregate used shall be the same as for single course except Grade 3 and Grade 4 aggregate will be required as shown in the plans and specifications.

3. CONSTRUCTION METHODS

The area to be treated shall be cleaned of dirt, dust or other deleterious matter by sweeping or other approved methods. If it is found necessary by the Engineer, the surface shall be lightly sprinkled just prior to the application of asphaltic material. Asphaltic material shall be applied on the cleaned surface by an approved type of self-propelled pressure distributor so operated as to distribute the material in the quantity specified, evenly and smoothly, under a pressure necessary for proper distribution. The Contractor shall provide all necessary facilities for determining the temperature of the asphaltic material in all of the heating equipment and in the distributor, for determining the rate at which it is applied, and for securing uniformity at the junction of two distributor loads. The distributor shall have been recently calibrated and the Engineer shall be furnished an accurate and satisfactory record of such calibration. After beginning the work, should the yield on the asphaltic material appear to be in error, the distributor shall be calibrated in a manner satisfactory to the Engineer before proceeding with the work.

Asphaltic material may be applied for the full width of the seal coat in one application unless the width exceeds 26 feet. Asphaltic material shall not be applied until immediate covering with aggregate is assured. Immediately after the application of asphalt, the aggregate shall be evenly spread over the surface. Mechanical spreading devices shall be of a type approved by the Engineer. The cover material must be evenly and accurately distributed to the end that an even and smooth surface is obtained. Immediately after the aggregate has been applied, the surface shall be adequately raked and broomed

to insure uniformity. As soon as proper distribution of aggregate can be obtained, the surface shall be flat-rolled having a gross weight of not less than four (4) tons, and not more than ten (10) tons. The Contractor shall so arrange his work that the rolling of all aggregate applied that day shall be completed on the road before daylight. The asphalt and aggregate shall be applied at the approximate rate indicated on plans within the limits of the following schedule as directed by the Engineer.

	Gallons of Asphalt		Aggregate	
	Per Square Yard		Cu.Yd. to Sq.Yds.	
	<u>Min.</u>	<u>Max.</u>	<u>Min.</u>	<u>Max.</u>
Asphalt Cement .....	0.15	0.30	1:200	1:100

The Contractor shall be responsible for the maintenance of the surface until the work is accepted by the Engineer. All holes or failures in the seal coat surface shall be repaired by use of additional asphalt and aggregate and all fat or bleeding surfaces shall be covered with approved cover material in such manner that the asphaltic material will not adhere to or be picked up on the wheels of vehicles.

All storage tanks, piping, retorts, booster tanks and distributors used in storing or handling asphaltic material shall be kept clean and in good operating condition at all times, and they shall be operated in such manner that there will be no contamination of the asphalt with foreign material. It shall be the responsibility of the Contractor to provide and maintain in good working order a recording thermometer at the storage-heating unit at all times.

The temperature of application shall be within the limits recommended in the specification, Section 025404 "Asphalts, Oil and Emulsions", with that being 220 to 300 °F for AC-3 and 275 to 350 °F for AC-5.

4. MEASUREMENT & PAYMENT

Unless indicated otherwise in the proposal, **SEAL COAT** will be measured by the square yard in place to the limits shown on the plans and as directed by the Engineer. The payment will include full compensation for cleaning and sprinkling the existing surface; for furnishing, preparing, hauling and placing all materials; for all freight involved; and for all manipulations, labor, tools, equipment and incidentals necessary to complete the work.



SECTION 025418  
SURFACE TREATMENT (S-32)

1. DESCRIPTION

One course surface treatment shall consist of a wearing surface composed of a single application of asphalt material covered with aggregate, constructed on the prepared based course or surface in accordance with this specification.

Two course surface treatment shall consist of a wearing surface composed of two applications of asphalt material, each covered with aggregate, constructed on the prepared base course or surface in accordance with this specification.

Three course surface treatment shall consist of a wearing surface composed of three applications of asphalt material, each covered with aggregate, constructed on the prepared base course or surface in accordance with this specification.

2. MATERIALS

1) Asphalt Materials.

The asphalt materials used shall be AC-5 (AC-3 in winter) or other approved material as described in the specification Section 025404 "Asphalt, Oils and Emulsions."

2) Aggregate

Single Course: The aggregate used shall be Class A, Type A (Type PA for pre-coated aggregate) Grade 4 as described in specification Section 025414 "Aggregate for Surface Treatments and Seal Coats."

Multiple Course: The aggregates used shall be the same as for single course except Grade 3 and Grade 4 aggregate will be required as shown in the plans and specifications.

3. CONSTRUCTION METHODS

The area to be treated shall be cleaned of dirt, dust, or other deleterious matter by sweeping or other approved methods. If it is found necessary by the Engineer, the surface shall be lightly sprinkled just prior to the application of the asphalt material.

Asphalt material shall be applied on the clean surface by an approved type of self-propelled pressure distributor so operated as to distributed the material in the quantity specified, evenly and smoothly, under a pressure necessary for proper distribution. The Contractor shall provide all necessary facilities for determining the temperature of asphalt material in all of the heating equipment and in the distributor, for determining the rate at which it is applied, and for determining the rate at which it is applied, and for securing uniformity at the junction of two distributor loads. The distributor shall have been recently calibrated and the Engineer shall be furnished an accurate and satisfactory record of such calibration. After beginning the work, should the yield on the asphalt material appear to be in error, the distributor shall be calibrated in a manner satisfactory to the Engineer before proceeding with the work. Asphalt material may be applied for the full width of the surface treatment in one application, unless the width exceeds 26 feet. No traffic or

hauling will be permitted over the freshly applied asphalt material. Asphalt material shall not be applied until immediate covering is assured.

Aggregate shall be immediately and uniformly applied and spread by an approved self-propelled continuous feed aggregate spreader, unless otherwise shown on the plans or authorized by the Engineer in writing.

Surface treatment shall not be applied when the air temperature is below 60° and is falling, but it may be applied when the air temperature is above 50° and is rising, the air temperature being taken in the shade and away from artificial heat. Asphalt material shall not be placed when general weather conditions, in the opinion of the Engineer, are not suitable.

The rates of application of the aggregate and asphalt shall be as follows or as otherwise specified:

	<u>1st Course</u>	<u>2nd Course</u>	<u>3rd Course</u>
Asphalt Cement	0.2 gal/s.y.	0.16 gal/s.y.	0.16 gal/s.y.
Pre-coated Limestone (Rock Asphalt)	1:80 Grade 3	1:100 Grade 4	1:100 Grade 4

The entire surface shall be broomed, bladed or raked and thoroughly rolled as required by the Engineer.

Where multiple courses are specified, each course shall be applied in the manner specified for one course.

The Contractor shall be responsible for the maintenance of the surfaces until the Engineer accepts the work.

All storage tanks, piping, retorts, booster tanks and distributors used in storing or handling asphalt materials shall be kept clean and in good operating condition at all times, and they shall be operated in such manner that there will be no contamination of the asphalt materials with foreign material. It shall be the responsibility of the Contractor to provide and maintain in good working order a recording thermometer at the storage-heating unit at all times.

The Engineer will select the temperature of application based on the temperature-viscosity relationship that will permit application of the asphalt within the limits recommended in the specification, "Asphalt, Oil and Emulsions". The temperature of application shall be within the limits recommended in the specification, Section 025404 "Asphalts, Oil and Emulsions", with that being 220 to 300 °F for AC-3 and 275 to 350 °F for AC-5.

#### 4. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, **SURFACE TREATMENT** shall be measured in place by square yard of surface area to the limits shown on the plans and as directed by the Engineer. Payment shall be full compensation for all labor, materials, and equipment necessary to furnish and place the type of surface treatment called for.

SECTION 025419  
SLURRY SEAL (S-37)

1. SCOPE: The work covered by this specification consists of furnishing all plant, labor, equipment and material and performing all operations necessary in connection with the application of a slurry seal surface upon designated areas.

2. DESCRIPTION: The slurry seal shall consist of a mixture of emulsified asphalt, mineral aggregate, and water; properly proportioned, mixed and spread on the surface as specified here in and as directed by the Engineer.

3. MATERIALS:

A. Asphalt Emulsion. The emulsified asphalt shall be type SS-1h conforming to A.S.T.M. D-977 except that the viscosity requirement shall be changed to range of 20-50.

B. Aggregate. The mineral aggregate shall consist of natural or manufactured sand, slag, crushed fines, or a combination thereof. The aggregate shall be clean and free of vegetable matter and other deleterious substances. The aggregate blend shall have a minimum sand equivalent value of not less than 45 when tested by AASHTO T176-56. Smooth textured sand of less than 1.25% water absorption shall not exceed 50% of the total combined aggregate.

C. Mineral Filler. Mineral filler shall be any recognized brand of Portland cement that is free of lumps.

D. Water. All water used with the slurry seal mixture shall be potable and free from harmful soluble salts.

4. EQUIPMENT: All equipment, tools, and machines used in the performance of this work shall be maintained in satisfactory working condition.

A. Mixer. The slurry seal mixing machine shall be a continuous flow mixing unit and be capable of delivering water and also capable to deliver accurately a predetermined proportion of aggregate and asphalt emulsion to the mixing chamber and to discharge the thoroughly mixed product on a continuous basis. The aggregate shall be prewetted immediately prior to mixing with the emulsion. The mixing unit of the mixing chamber shall be capable of thoroughly blending all ingredients together. No violent mixing shall be permitted.

The mixing machine shall be equipped with a approved fines feeder that provides an accurate metering device or method to introduce a predetermined amount of mineral filler into the mixer at the same time and location that the aggregate is fed. The fines feeder shall be used whenever added mineral filler is a part of the aggregate blend.

The mixing machine shall be equipped with a water pressure system and fog type spray bar, adequate for complete fogging of the surface preceding spreading equipment, with a maximum application rate of 0.05 gallons per square yard. A calibrated control for aggregate and asphalt emulsion shall be provided and capable of proportioning accurately the materials.

The machine shall be capable of a minimum speed of 60 feet per minute and shall not be allowed to exceed 180 feet per minute while in operation. Sufficient machine storage capacity to mix properly and apply a minimum of five tons of the slurry shall be provided.

B. Spreading Equipment. Attached to the mixer machine shall be a mechanical type squeegee distributor equipped with flexible material in contact with the surface to prevent loss of slurry from the distributor. It shall be maintained so as to prevent loss of slurry on varying grades and crown by adjustments to assure uniform spread. There shall be a steering device and a flexible strike-off.

C. Auxiliary Equipment. Hand squeegees, shovels, and hand equipment shall be provided as necessary to perform work.

5. PROPORTIONING: The Engineer shall approve all slurry seal materials and methods prior to mixing and application. The proportions of the mixture to be used shall be as follows unless variations are approved by the Engineer. The Contractor shall make trial batches for evaluation at this expense to determine the final blend of mineral aggregate and residual asphalt.

Aggregate:

The combined mineral aggregate shall conform to the following gradation when tested by the previous mentioned test:

<u>Sieve Size</u>	<u>Percent Passing</u>
3/8	100
#4	85 - 100
#8	65 - 90
#16	45 - 70
#30	30 - 50
#50	18 - 30
#100	10 - 21
#200	5 - 15

Emulsified Asphalt:

The amount of asphalt emulsion to be blended with the aggregate shall be such to result in a residual asphalt content of 7.5 to 13.5 percent by weight of dry aggregate.

Mineral Filler:

Mineral filler shall not exceed 3.0 percent by weight of the dry aggregate.

Water:

A minimum amount of water shall be added as necessary to produce the proper consistency and obtain a fluid and homogeneous mixture.

6. CONSTRUCTION REQUIREMENTS: Immediately prior to applying slurry seal, the surface shall be cleaned of all loose material, silt spots, vegetation, and other objectionable material.

All existing pavement markings shall be removed by grinding.

Any depressions, large cracks, etc., shall be patched before applying the slurry seal surface.

The rate of application of the slurry seal shall be between 8 and 12 pounds per square yard based on dry aggregate weight.

The surface shall be fogged with water directly preceding the spreader. The slurry mixture shall be of the desired consistency when deposited on the surface and no additional elements shall be added. Total time of mixing shall not exceed four minutes. A sufficient amount of slurry shall be carried in all parts of the spreader at all times so that complete coverage is obtained, and the maximum allowable speed shall be 180 feet per minute.

Approved squeegees shall be used to spread slurry in non-accessible areas to the slurry mixer.

Excess build up of slurry on longitudinal or transverse joints will not be permitted.

The slurry seal surface shall be rolled by a pneumatic roller having a tire pressure of 50 pounds per square inch. The paved area shall be subjected to a minimum of five passes with the roller.

The slurry shall not be applied when either atmospheric pavement temperature is 55F. and falling but may be applied when either the atmospheric or pavement temperature is 45° F. and rising. The slurry shall not be applied during period of abnormally high relative humidity.

7. MEASUREMENT AND PAYMENT:

Unless indicated otherwise in the Proposal, **SLURRY SEAL** shall be measured and paid for by the square yards of material installed and accepted. Such payment and price shall constitute full compensation for all labor, materials equipment and incidentals necessary to complete the item as specified.

SECTION 025422  
COLD MIX LIMESTONE ROCK ASPHALT PAVEMENT (Class A) (S-33)

1. MATERIAL

This specification shall consist of a surface course, a leveling-up course, or a combination of these courses as shown on plans, composed of a compacted layer of natural limestone rock asphalt, cold mixed with prescribed flux and shall be constructed on the completed and approved base course, existing pavement or floor slab, all in accordance with these specifications and in conformity with lines, grades, quantities and typical cross section shown on plans. The mixture when designed and tested in accordance with these specifications shall have a laboratory stability of not less than 30 percent unless otherwise shown on the plans.

2. MATERIALS

- (1) Rock Asphalt. This material shall be composed of natural limestone rock asphalt. This material shall contain not more than 1 percent by weight of organic matter (other than native bitumen), clays, loam or pebbles coated therewith and shall contain not more than 5 percent by weight of any one of or combination of slate, shale, schist, soft particles or other undesirable materials when tested in accordance with Test Method Tex-217-F.

The rock asphalt mixture shall be uniform and well graded and shall contain natural limestone rock asphalt aggregate with an average bitumen content of 5 to 9 percent by weight of naturally impregnated asphalt as determined by Test Method Tex-215-F, and shall contain not more than 2 percent by weight of any one of or combination of iron pyrites, or other objectionable matter, as determined by Test Method Tex-217-F.

No aggregate shall contain a total of more than 5 percent by weight of impurities or objectionable matter listed above.

The portion of the material passing the No. 10 sieve shall have by weight not more than 8.5 percent nor less than 5 percent of naturally impregnated asphalt.

Except for Type 'D' Paving Mixture, the portion of the material retained on the No. 4 sieve shall contain by weight from 20 percent to 35 percent of material with a naturally impregnated asphalt content of less than 1 percent. The portion of the material retained on the No. 4 sieve for Type 'D' Paving Mixture shall contain by weight from 15 percent to 35 percent of the material with a naturally impregnated asphalt content of less than 1 percent. This percentage shall be adjusted within the grading limits to obtain an acceptable mixture.

The percent of wear on limestone rock asphalt aggregate shall be no more than 40 as determined by Test Method Tex-410-A and shall be made on that portion of the material retained on the No. 4 sieve having a naturally impregnated asphalt content of less than 1 percent. Rock Asphalt shall have a minimum polish value of 35, unless otherwise specified, when tested in accordance with Test Method Tex-438-A.

No material shall be used before the source has been approved and the material has been sampled, tested and approved by the Engineer. The Contractor shall notify the Engineer in advance if change in source of any material is desired, and both the new source and material shall be

approved by the Engineer prior to use.

- (2) Flux. The fluxing material shall meet the Flux Oil requirements of the specification, Section 025404 "Asphalts, Oils and Emulsions".

Tack Coat. The asphalt material for tack coat shall meet the requirements for emulsified asphalt, EA-11M, or cut-back asphalt, RC-2. If RC-2 cut-back asphalt is used it may, upon instruction from the Engineer, be diluted by the addition of an approved grade of gasoline and/or kerosene, not to exceed 15 percent by volume. Asphaltic materials shall meet the requirements of the specification, Section 025404 "Asphalts, Oils and Emulsions".

### 3. PAVING MIXTURES

- (1) Types. The paving mixture shall consist of a uniform mixture of crushed limestone rock asphalt aggregate, flux and water if needed. The grading shall be such as to produce, when properly proportioned, a mixture which, when tested in accordance with Test Method Tex-200-F, will conform to the limitations for grading given below for the type specified prior to the aggregate. The grading to be used in these mixtures, within the limits specified, shall be approximately as designed by the Engineer, and the mixture produced shall be uniform.

	Percent by Weight
Type "A"	
Retained on 1" sieve .....	0
Retained on 7/8" sieve .....	0 to 2
Retained on 5/8" sieve .....	5 to 15
Retained on 3/8" sieve .....	25 to 35
Retained on No. 4 sieve .....	50 to 60
Retained on No. 10 sieve .....	25 to 35
Type "B"	
Retained on 5/8" sieve .....	0
Retained on 1/2" sieve .....	0 to 2
Retained on 3/8" sieve .....	5 to 15
Retained on No. 4 sieve .....	45 to 60
Passing No. 10 sieve .....	25 to 35
Type "C"	
Retained on 1/2" sieve .....	0
Retained on 3/8" sieve .....	0 to 2
Retained on No. 4 sieve .....	40 to 55
Passing No. 10 sieve .....	20 to 35
Type "CC"	
Retained on 1/2" sieve .....	0
Retained on 3/8" sieve .....	0 to 2
Retained on No. 4 sieve .....	40 to 55
Passing No. 10 sieve .....	35 to 50
Type "D"	
Retained on 3/8" sieve .....	0

Retained on 1/4" sieve .....	0 to 2
Retained on No. 4 sieve .....	5 to 15
Passing No. 10 sieve .....	35 to 50

- (2) Sampling and Testing. The mixture shall be tested in accordance with Texas Test Methods to determine whether it complies with the governing specification requirements.

Stability is a control requirement. If the stability of the mixture produced has a value 10 percent lower than that specified, corrective measures shall be taken to bring the mixture within the specified requirements.

- (3) Tolerances. The designated grading and fluxing material content shall be such that when the tolerances listed below are allowed, the grading and the fluxing material content will be within the grading limits specified. The respective tolerances, based on the percent by weight of the mixture, are listed as follows:

	Percent by Weight
Retained on 7/8" sieve .....	plus or minus 4
Retained on 5/8" sieve .....	plus or minus 4
Retained on 1/2" sieve .....	plus or minus 4
Retained on 3/8" sieve .....	plus or minus 4
Retained on 1/4" sieve .....	plus or minus 4
Retained on No. 4 sieve .....	plus or minus 4
Total Retained on No. 10 sieve .....	plus or minus 3
Fluxing Material	plus or minus 0.2

- (4) Material Produced for Maintenance Requisition. The limestone rock asphalt aggregate grading and flux content of the mixture shall be within the limits specified. The designated grading and flux content shall be selected from the first shipment for material on each shipment or partial shipment where requested by the Engineer, and the mixture produced shall conform to this designated grading and flux context throughout each shipment or partial shipment, respectively, within the tolerances specified above.

- (5) Water Content. If the rock asphalt mixture is prepared at some central point and shipped to the work, water may be added to prevent setting-up in transit. If water is added, the total water so added shall not exceed 4 percent by weight and shall be administered to the mixture through an approved spray bar. If the rock asphalt mixture is prepared on or adjacent to the project, the addition of water will not be permitted unless authorized by the Engineer. The amount of water that may be added shall be as designated by the Engineer but shall not exceed 4 percent by weight. In order to insure uniformity of the rock asphalt mixture a suitable measuring devise, subject to approval of the Engineer, shall be used to accurately measure the amount of water to be incorporated into each batch. All water in the mixture on the truck scales shall be deducted in determining the tonnage of mixture for payment. The method of determining the water content of the mixture shall be in accordance with Test Method Tex-212-F. The water content shall be measured on representative samples, each representing approximately 200 tons. Not less than one sample shall be taken on each day's run.

- (6) Physical Properties of the Mixture. The material may be mixed on the job or at some central mixing plant and shipped ready to use. Mixtures that do not remain workable a sufficient period of time to permit unloading by



normal means, proper spreading, blading and rolling, will not be acceptable.

The type and amount of the mixture used shall be as specified on the plans.

#### 4. EQUIPMENT

- (1) Mixing Plants. Mixing plants that will not continuously produce a mixture meeting all of the above requirements will be condemned.

Mixing plants may be either the weight-batching type or the continuous mixing type. Both types of plant shall be equipped with satisfactory conveyors, power units, aggregate handling equipment, aggregate screens and bins and shall consist of the following essential pieces of equipment:

(a) Weight-Batching Type.

Cold Aggregate Bin and Proportioning Device. The cold aggregate bins or aggregate stockpiles shall be of sufficient number and shall be of sufficient size to supply the amount of aggregate required to keep the plant in continuous operation. The proportioning device shall be such as will provide a uniform and continuous flow of aggregate in the desired proportion to the plant.

Screening and Proportioning. The screening capacity and size of the bins shall be sufficient to screen and store the amount of aggregate required to properly operate the plant and keep the plant in continuous operation at full capacity. Proper provisions shall be made to enable inspection forces to have easy and safe access to the proper location on the mixing plant where accurate representative samples of aggregate may be taken from the bins for testing. The aggregate shall be separated into at least four bins when producing Type "A" mixtures, at least three bins when producing Type "B" and at least two bins when producing Types "C" and "D".

Type "A":

- Bin No. 1 - will contain aggregates of which 85 to 100 percent by weight will pass the No. 10 sieve.
- Bin No. 2 - will contain aggregates of which at least 85 percent by weight will be of such size as to pass the 3/8 inch sieve and be retained on the No. 10 sieve.
- Bin No. 3 - will contain aggregates of which at least 85 percent by weight will be of such size as to pass the 1/2 inch sieve and be retained on the 1/4 inch sieve.
- Bin No. 4 - will contain aggregates of which at least 85 percent by weight will be of such size as to pass the 7/8 inch sieve and be retained on the 3/8 inch sieve.

Type "B":

- Bin No. 1 - will contain aggregates of which 85 to 100 percent by weight will pass the No. 10 sieve.

Bin No. 2 - will contain aggregates of which at least 85 percent by weight will be of such size as to pass the 3/8 inch sieve and be retained on the No. 10 sieve.

Bin No. 3 - will contain aggregates of which at least 85 percent by weight will be of such size as to pass the 1/2 inch sieve and be retained on the 1/4 inch sieve.

Type "C", Type "CC" and Type "D":

Bin No. 1 - will contain aggregates of which 85 to 100 percent by weight will pass the No. 10 sieve.

Bin No. 2 - will contain aggregates of which at least 85 percent by weight will be of such size as to pass the 3/8 inch sieve and be retained on the No. 10 sieve.

Aggregate Weigh Box and Batching Scales. The aggregate weigh box and batching scales shall be of sufficient capacity to hold and weigh a complete batch of aggregate.

Flux Oil Bucket and Scales. The flux oil bucket and scales shall be of sufficient capacity to hold and weigh the necessary material for one batch.

Mixer. The mixer shall be of the pug mill type and shall have a capacity of not less than 3,000 pounds in a single batch. The number of blades and the position of same shall be such as to give a uniform and complete circulation of the batch in the mixer. The mixer shall be equipped with an approved spray bar that will distribute the fluxing material quickly and uniformly throughout the mixer. If, in the opinion of the Engineer, any mixer has a tendency to segregate the mineral aggregate or fails to secure a thorough and uniform mixing with the fluxing material, it shall not be used. All mixers shall be provided with an automatic time lock that will lock the discharge doors and the shaft seals of the mixer shall be tight enough to prevent the spilling of aggregate or mixture from the pug mill.

(b) Continuous Mixing Type

Cold Aggregate Bin and Proportioning Device. Same as for weight-batching type of plant.

Screening and Proportioning. Same requirements as specified under weight-batching plants. These requirements shall also apply to materials that are stockpiled and that are proposed for direct use by a continuous mixing plant without the use of plant bins.

Fluxing Material Spray Bar. The fluxing material spray bar shall be so designed

Mixer. The mixer shall be of the pug mill continuous type and shall have a thorough and uniform mixing of the aggregate with the fluxing material, it shall not be used.

(2) Spreading and Finishing Machine. The spreading and finishing machine, when permitted, shall be a type approved by the Engineer and shall be capable of producing a surface that will meet the requirement of the typical cross section and the surface test.

(3) Motor Grader. The motor grader shall be a self-propelled power-

grader; it shall be equipped with smooth tread pneumatic tired wheels; shall have a blade length of not less than 12 feet; shall have a wheel base of not less than 16 feet; and shall be tight and in good operating condition and approved by the Engineer.

- (4) Pneumatic Tire Rollers. The rollers shall consist of not less than seven pneumatic tired wheels, running on axles in such manner that the rear group of tires will cover the entire gap between adjacent tires of the forward group, and mounted in a rigid frame and provided with a loading platform or body suitable for ballast loading. The front axle shall be attached to the frame in such manner that the roller may be turned within a minimum circle. The pneumatic tire roller under working conditions shall have an effective rolling width of approximately 84 inches and shall be so designed that be ballast loading the total load may be varied uniformly from 23,500 pounds or less to 50,000 pounds or more. The roller shall be equipped with tires that will afford ground contact pressures to 90 pounds per square inch or more. The operating load and tire air pressure shall be within the range of the manufacturer's chart as directed by the Engineer. The Contractor shall furnish the Engineer with charts and tabulations showing the contact areas and contact pressures for the full range of tire inflation pressures and for the full range of loadings for the particular tires furnished.

The pneumatic tire roller shall be drawn by either a suitable crawler type tractor, a pneumatic tired tractor, or a truck of adequate tractive effort, or may be of the self-propelled type, and the roller, when drawn or propelled by either type of equipment, shall be considered a medium pneumatic tire roller unit. The power unit shall have adequate tractive effort to properly move the operating roller at variable uniform speeds up to approximately 5 miles per hour.

The tire pressure of each tire shall be adjusted as directed by the Engineer and this pressure shall not vary by more than 5 pounds per square inch.

- (5) Two Axle Tandem Roller. This roller shall be an acceptable power drive tandem roller weighing not less than 8 tons.
- (6) Three Wheel Roller. This roller shall be an acceptable power driven three wheel roller, weighing not less than 10 tons.
- (7) Three Axle Tandem Roller. This roller shall be an acceptable driven three axle roller weighing not less than 10 tons.
- (8) Straightedges and Templates. The Contractor shall provide acceptable 10-foot straightedges for surface testing. Satisfactory templates shall be provided as required by the Engineer.
- (9) Trunk Scales. A set of standard platform truck scales, shall be placed at a location approved by the Engineer.

- (10) All Equipment. Shall be maintained in good repair and operating condition and shall be approved by the Engineer.
- (11) Alternate Equipment. When permitted by the Engineer in writing, equipment other than that specified which will consistently produce satisfactory results may be used.

5. STORAGE, PROPORTIONS AND MIXING

(1) Storage of Rock Asphalt

Central Mixing Plants. Sufficient material shall be stored, stockpiled or produced to permit continuous operation throughout any working period without shutdowns due to material shortages. If the natural limestone rock asphalt aggregates are stored or stockpiled, they shall be handled in such a manner as to prevent segregation, the mixing of various materials or sizes and the contamination with foreign materials.

Storage of the crushed limestone rock asphalt mixture upon the ground will not be permitted at the plant site. Material that comes in contact with earth or other objectionable foreign matter shall be rejected. Mixtures that do not remain workable a sufficient period of time to permit proper spreading, blading and rolling will not be acceptable. Storage, handling or loading of the rock asphalt mixture shall be in such manner as to prevent undue segregation.

- (2) Storage and Heating of Flux. The flux storage shall be ample to meet the requirements of the plant. The flux may be heated by steam coil or direct fire to a temperature not to exceed 250°F. Agitation by steam or air will not be permitted. If direct fire heating is used, the heating equipment shall be such that it will insure positive circulation of the flux while being heated and shall be approved by the Engineer. Care shall be taken not to injure the flux by subjecting it to undue continuous heat. The heating apparatus shall be equipped with a recording thermometer with a 24 hour chart that will record the temperature of the fluxing material where it is at the highest temperature.

- (3) Proportioning. The proportioning of the various material entering into the mixture shall be in accordance with these specification. Aggregate shall be proportioned by weight using the weigh box and batching scales when the weight-batch type of plant is used and by volume using the aggregate proportioning device when the continuous mixer type of plant is used. The fluxing material shall be proportioned by weight or by volume based on weight using the specified equipment. The proportions of each constituent by weight of the paving mixture shall be within the following limits.

Crushed Limestone Rock Asphalts, 96 to 97.5 percent by weight.

Flux Material, 2.5 to 4 percent by weight.

- (4) Mixing. In introducing the batch into the mixer, the sequence of addition of aggregate and flux oil and the amount of mixing shall

be done in a manner to minimize formation of "flux balls" and produce optimum conditions for a homogeneous mix. The mixer shall be equipped with an approved spray bar that will distribute the flux oil quickly and uniformly throughout the mixer. Any mixer that has a tendency to segregate the rock asphalt aggregate or fails to secure a thorough and uniform mixing with the flux oil shall not be used.

Mixtures produced when the limestone rock asphalt aggregates contain moisture in excess of saturated surface dry condition will not be accepted. Excess moisture will be evidenced by visual surface moisture on the aggregates or any unusual quantities of fines clinging to the coarse aggregate.

In order to observe plant operations and the rock asphalt mixtures, adequate lighting shall be provided or mixing shall be confined to the daylight hours.

All limestone rock asphalt mixtures shipped on any one particular requisition or project shall be produced out of the same mixing plan, unless if in the opinion of the Engineer there is no difference in the quality of the rock asphalt mixture when produced by two difference mixing plants. Materials produced by a weight-batching plant shall not be mixed with material produced from a continuous mixing plant.

## 6. CONSTRUCTION METHODS

The rock asphalt mixture, tack coat or prime coat shall not be placed when the air temperature is below 60°F and is falling, but it may be placed when the air temperature is above 50°F and is rising, the temperature being taken in the shade away from artificial heat, with the further provision that asphaltic mixture or tack coat shall only be placed when the humidity and general weather conditions, in the opinion of the Engineer, are suitable.

- (1) Prime Coat. If a prime coat is required, it will be applied and paid for as a separate item. The tack coat or rock asphalt mixture shall not be applied on a previously primed flexible base until the primed base has completely cured to the satisfaction of the Engineer.
- (2) Tack Coat. Before the rock asphalt mixture is laid, the surface upon which the tack coat is to be placed shall be cleaned thoroughly to the satisfaction of the Engineer. The surface shall be given a uniform application of tack coat meeting the requirements for tack coat under asphaltic materials of this specification. This tack coat shall be applied, as directed by the Engineer, with an approved sprayer at a rate not to exceed 0.05 gallon per square yard of surface. Where the mixture will adhere to the surface on which it is to be placed without the use of a tack coat, the tack coat may be eliminated by the Engineer. The tack coat shall be rolled with a pneumatic tire roller as directed by the Engineer.
- (3) Placing. If the mixtures are shipped to the job, the railroad cars shall first be cleaned of all foreign matter, and the material shall be loaded in such a manner as to prevent segregation. The rock asphalt mixture, prepared as specified, shall be hauled to the work in tight vehicles previously cleaned of all foreign materials. The dispatching of the vehicles shall be so that all material delivered may be placed and shall have

received its initial rolling in daylight. The mixture shall be laid only on an approved base course or pavement which has been tack-coated as previously specified and shall be free of all foreign materials. All contact surfaces of curbs and structures and all joints shall be painted with a thin uniform coating cut-back or emulsified asphalt as required for tack-coating the base.

The mixture shall be thoroughly aerated and then spread into place with a motor grader, in a uniform layer of such depth that after receiving ultimate compaction by rolling, the requirements of the typical cross sections will have been fulfilled. Hand spreading will be permitted where the mixture is placed on narrow stripes or small irregular areas.

Adjacent to flush curbs, gutters, liners and structures, the surface mixture shall be finished uniformly high so that when compacted it will be slightly above the edge of the curb or flush structure. During the application of asphaltic material, care shall be taken to prevent splattering of adjacent pavement, curb and gutters or structures.

Where more than one course of pavement is to be placed, no succeeding course shall be placed until the preceding course has cured to the satisfaction of the Engineer, but shall contain not more than a maximum of 3 percent moisture and 0.2 percent hydrocarbon volatile content of the mixture by weight as determined by Test Method Tex-212-F and 213-F or test methods included in THD Bulletin C-14

Alternate Method of Placing. When indicated on the plans or directed by the Engineer in writing, the mixture may be spread with the specified spreading and finishing machine. In placing the material with a spreading and finishing machine, rolling shall be deferred for a period of time, as directed by the Engineer, to allow for volatilization. Where more than one course of pavement is to be placed, no succeeding course shall be placed until the preceding course has cured to the satisfaction of the Engineer, but shall contain not more than a maximum of 3 percent moisture and 0.2 percent hydrocarbon volatile content of the mixture by weight as determined by Test Method Tex-212-F and 213-F

(4) Compacting

(a) The pavement shall be compressed thoroughly and uniformly with the specified rollers and/or other approved rollers.

- (b) Rolling with the three wheel and tandem rollers shall start longitudinally at the sides and proceed toward the center of the pavement, overlapping on successive trips by at least half the width of the rear wheels. Alternate trips of the roller shall be slightly different in length. On super-elevated curves, rolling shall begin at the low side and progress toward the right side. Rolling with pneumatic tire roller shall be done as directed by the Engineer. Rolling shall be continued until no further compression can be obtained and all roller marks are eliminated. One tandem roller, one pneumatic tire roller and at least one three wheel roller as specified above shall be provided for each job. If the Contractor elects he may substitute the three axle tandem roller for the two axle tandem roller and/or the three wheel roller; but in no case shall less than three rollers be in use on each job. Additional rollers shall be provided if needed. The motion of the roller shall be slow enough at all times to avoid displacement of the mixture. If any displacement occurs, it shall be corrected at once by the use of rakes and of fresh mixture where required. The roller shall not be allowed to stand on pavement which has not been fully compacted. To prevent adhesion of the surface mixture to the roller, the wheels shall be kept thoroughly moistened with water, but an excess of water will not be permitted, All rollers must be in good mechanical condition. Necessary precautions shall be taken to prevent the dropping of gasoline, oil, grease or other foreign matter on the pavement, either when the rollers are in operation or when standing. When permitted by the Engineer in writing, equipment other than that specified which will consistently produce satisfactory results may be used.
- (c) Pavement Compaction. When a pavement compaction requirement is specified, it is the intent of this specification that the material be placed and compacted such that the actual specific gravity of the pavement after compaction is equal to or greater than the minimum percent, indicated on the plans, of the laboratory actual specific gravity. The method of determining the in-place actual specific gravity shall be as designated by the Engineer, each method correlated satisfactorily with results obtained from standard tests as described in Test Method Tex-207-F. In-place percent compaction tests are intended for compaction control. If the in-place percent compaction is lower than that specified, work may proceed with changes in the construction operations, rolling procedure and/or, rolling sequence until the in-place percent compaction equals or exceeds that specified.
- (d) Handling Tamping. The edges of the pavement along curbs, headers and similar structures, and pavement mixtures at all places not accessible to the roller, or in such positions as will not allow through compaction with the roller, shall be thoroughly compacted with lightly oiled tamps.
- (5) Surface Test. The surface of the pavement, after compression, shall be smooth and true to the established line, grade and cross section, and when tested with a 10-foot straightedge placed parallel to the centerline of the roadway, it shall have no deviation in excess of 1/16 inch per foot from the nearest point of contact. The maximum ordinate measured from the face of the

straightedge shall not exceed 1/4 inch at any point. Any point in the surface not meeting these requirements shall be immediately corrected.

- (6) Opening to Traffic. The pavement shall be opened to traffic when directed by the Engineer. All construction traffic allowed on the pavement shall comply with the State laws governing traffic on highways.

#### 7. MEASUREMENT & PAYMENT

Unless indicated otherwise in the Proposal, Cold MIX Limestone Rock Asphalt Pavement shall be measured as described below.

- (a) Measured by the square yard of the type and thickness of "Cold Mix Limestone Rock Asphalt Pavement" specified in Section 025422.
- (b) Measured by the total weight of "Cold Mix Limestone Rock Asphalt Pavement" in Section 025422, of the type specified delivered to the jobsite.

The Contractor shall provide the Engineer with copies of the pay ticket identifying the truck and showing the gross empty weight of the truck with driver as it arrives at the plant and the gross loaded weight of the truck with driver as it leaves the plant. The measured amount will be the difference of the loaded and empty trucks converted to tons. Payment shall be full compensation or furnishing all material; for all heating, mixing, hauling, cleaning base course, tack coat, placing rock asphalt mixture; all blading, rolling and finishing; and for all labor, tools, equipment and incidentals necessary to complete the work except prime coat when required.



SECTION 025424  
HOT MIX ASPHALTIC CONCRETE PAVEMENT (Class A) (S-34)

1. DESCRIPTION

This specification shall govern all work required for furnishing and laying Hot Mix Asphalt Concrete (HMAC) surface, binder and base courses required to complete the project.

2. MATERIALS

2.1. Aggregate: The aggregate shall consist of a blend of course aggregate, fine aggregate and, if required, a mineral filler.

2.1.1. Coarse Aggregate shall consist of that fraction of aggregate retained on a No. 10 sieve and shall consist of crushed furnace slag, crushed stone, or crushed gravel.

Deterious material in coarse aggregate shall not exceed 2% per TEX-217-F.

Course aggregate shall be crushed such that a minimum of 85% of the particles have more than one crushed face, unless noted otherwise on plans.

Los Angeles abrasion losses for course aggregate shall not exceed 40% by weight for the surface course and 45% for the binder and base courses per TEX-410-A.

Polish Value not less than 30 for aggregate used in the surface course per TEX-438-A.

2.1.2. Fine Aggregate is defined as the fraction passing a No. 10 sieve and shall be of uniform quality.

Fine aggregate shall consist of screenings of material that passes the Los Angeles abrasion requirements per above. Screenings shall be blended with a maximum of 15% un-crushed aggregate or field sand for Type D mixes or a maximum of 10% uncrushed aggregate or field sand for Type A, B, and C mixes.

Grading of fine aggregate shall be as follows:

<u>Sieve Size</u>	<u>Percent Passing by Weight</u>
No. 10	100
No. 200	0-15

2.1.3 Filler shall consist of dry stone dust, Portland cement, hydrated lime, or other approved by the Engineer.

Grading of filler shall be as follows:

<u>Sieve Size</u>	<u>Minimum Percent Passing by Weight</u>
No. 30	95
No. 80	75
No. 200	55

2.2 Reclaimed Asphalt Pavement (RAP): Reclaimed asphalt pavement may be incorporated into the hot mix asphalt concrete furnished for the project, provided that the mixture is designed per the TX DOT Methods and meets the applicable provisions of said TX DOT Item 340 and this specification.

2.3 Asphalt: Asphalt Material shall be in accordance with Section 025404 "Asphalt, Oils, and Emulsions" and AASHTO.

2.3.1 Paving Mixture:

<u>APPLICATION</u>	<u>ASPHALT GRADE</u>
Residential or low volume	PG 64-22
Collector	
Surface Course	PG 70-22
Binder Course	PG 64-22
Arterial	
Surface Course	PG 76-22
Binder Course	PG 64-22
Base Courses	PG 64-22

2.3.2 Tack Coat shall consist of an emulsion, SS-1 diluted with equal volume of water and applied at a rate ranging from 0.05 to 0.15 gallons per square yard.

3. PAVING MIXTURE

3.1 Mix Design: The mixture shall be designed in accordance with TX DOT Bulletin C-14 and TEX-204-F to conform to the requirements of this specification. The Contractor shall furnish the mix design for the job-mix to be used for the project, unless shown otherwise on the drawings. The mix design shall be submitted prior to placement of mixture.

The design procedures are actually intended to result at a job-mix with properties in compliance with these specifications and when properly placed the job-mix will be durable and stable. The sieve analysis of the job-mix shall be within the range of the Master Gradation and Tolerances specified herein. The job-mix shall meet the density and stability requirements as specified and shall be included with the mix design as submitted per above.

If the specific gravity of any of the types of aggregates differ by more than 0.3, use volume method.

Plot sieve analysis of job-mix; percent passing versus size on four-cycle semi-log paper or other appropriate type paper. Show tolerance limits and Limits of Master Gradation.

3.2 Master Gradation of Aggregate: The aggregate for the type of mix specified shall be within the following tabulated limits per TEX-200-F (Dry Sieve Analysis):

Sieve Size	Type			
	A Coarse Base	B Fine Base	C Course Surface	D Fine Surface
1-1/2"	100			
1-1/4"	95-100			
1"		100		
7/8"	70-90	95-100	100	
5/8"		75-95	95-100	
1/2"	50-70			100

3/8"		60-80	70-85	85-100
1/4"				
No. 4	30-50	40-60	43-63	50-70
No. 10	20-34	27-40	30-40	32-42
No. 40	5-20	10-25	10-25	11-26
No. 80	2-12	3-13	3-13	4-14
No. 200	1-6*	1-6*	1-6*	1-6*
VMA % minimum	11	12	13	14

\* 2-8 when Test Method Tex-200-F, Part II (Washed Sieve Analysis) is used.

3.3 Tolerances: The mixture delivered to the job site shall not vary from the job-mix by more than the tolerances specified below. The gradation of the produced mix shall not fall outside the Master Grading Limits, with the following exceptions: for Type B material courser than 3/8" and for Type D material courser than #4. Variations from job-mix shall not exceed the following limits, except as noted above:

<u>Item:</u>	<u>Tolerances Percent by Weight or Volume</u>
1" to No. 10	Plus or Minus 5.0
No. 40 to No. 200	Plus or Minus 3.0
Asphalt Weight	Plus or Minus 0.5
Asphalt Volume	Plus or Minus 1.2

3.4 Mix Properties: The mixture shall have a minimum Hveem stability of 40 for Type A,B, and C mixes and 35 for Type D mixes per TEX-208-F at an optimum density of 96% (plus or minus 1.5) of theoretical maximum per TEX-227-F and TEX-207-F.

3.5 Sampling and Testing of raw materials: The Contractor shall sample materials as necessary to produce a mix in compliance with these specifications.

#### 4. EQUIPMENT

4.1 Mixing Plants. Mixing plants shall be either the weight batching type or the drum mix type. Both types shall be equipped with satisfactory conveyors, power units, aggregate handling equipment, aggregate screens and bins (weigh batch only), and pollution control devices as required.

4.2 Truck Scales. A set of truck scales, if needed for measurement, shall be placed at a location approved by the Engineer.

4.3 Asphalt Material Heating Equipment. Asphalt material heating equipment shall be adequate to heat the required amount of material to the desired temperature. Agitation with steam or air will not be permitted. The heating apparatus shall be equipped with a recording thermometer with a 24-hour continuous chart that will record the temperature of the asphalt at the highest temperature.

4.4 Surge-Storage System. A surge-storage system may be used provided that the mixture coming out of the bins is of equal quality to that coming out of the mixer. The system shall be equipped with a gob

hopper, rotating chute, or other devices designed to minimize segregation of the asphalt mixture.

4.5 Laydown Machine. The laydown machine shall be capable of producing a surface that will meet the requirements of the typical cross section, of adequate power to propel the delivery vehicles, and produce the surface tolerances herein required. It shall be wide enough to lay a 28-foot back-back street in a maximum of two passes.

4.6 Rollers. All rollers shall be self propelled and of any type capable of obtaining the required density. Rollers shall be in satisfactory operating condition and free from fuel, hydraulic fluid, or any other fluid leaks.

5. STORAGE, PROPORTIONING, AND MIXING

5.1 Storage and Heating of Asphalt Materials. Asphalt cement shall not be heated to a temperature in excess of that recommended by the producer. Asphalt storage equipment shall be maintained in a clean condition and operated in such a manner that there will be no contamination with foreign matter.

5.2 Feeding and Drying of Aggregates. The feeding of various sizes of aggregate to the dryer shall be done in such a manner that a uniform and constant flow of materials in the required proportions will be maintained. In no case shall the aggregate be introduced into the mixing unit at a temperature in excess of 350 degrees F.

5.3 Proportioning. All materials shall be handled and proportioned in a manner that yield an acceptable mixture as herein specified and as defined by the job-mix.

5.4 Mixing.

5.4.1 Weight Batch Plant. In charging the weigh box and in charging the pugmill from the weigh box, such methods or devices shall be used as necessary to minimize segregation of the mixture.

5.4.2 Drum Mix Plant. The amount of aggregate and asphalt cement entering the mixer and the rate of travel through the mixer shall be coordinated so that a uniform mixture of the desired gradation and asphalt content will be produced.

5.4.3 The mixture produced from each type of plant shall not vary from the job-mix by more than the tolerances and restrictions herein specified. The mixture when discharged from the plant shall have a moisture content not greater than one percent by weight of total mix when determined by Test Method TEX-212-F.

5.4.4 The mixture produced from each type of plant shall be at a temperature between 250 and 325 degrees F. After a target mixing temperature has been established, the mixture when discharged from the mixer shall not vary from this temperature by more than 25 degrees F.

6. CONSTRUCTION METHODS

6.1 Construction conditions. For mat thicknesses greater than 1.5 inches, the asphalt material may be placed with a laydown machine when the air temperature is 40 degrees F. and rising but not when the air temperature is 50 degrees and falling. In addition, mat thickness less

than and including 1.5 inches shall not be placed when the temperature of the surface on which the mat is placed is below 50 degrees F.

6.2 Prime Coat. If a prime coat is required, it shall be applied and paid for as a separate item conforming to the requirements of the specification, "Prime Coat", except the application temperature shall be as provided above. The tack coat or asphaltic concrete shall not be applied on a previously primed flexible base until the primed base has completely cured to the satisfaction of the Engineer.

6.3 Tack Coat. Before the asphalt mixture is laid, the surface upon which the tack coat is to be placed shall be thoroughly cleaned to the satisfaction of the Engineer. The surface shall be given a uniform application of tack coat using materials and rates herein specified and/or as shown on the plans. The tack coat shall be rolled with a pneumatic tire roller as necessary.

6.4 Transporting Asphalt Concrete. The asphalt mixture shall be hauled to the job site in tight vehicles previously cleaned of all foreign matter. In cool weather or for long hauls, canvas covers and insulated truck beds may be necessary. The inside of the bed may be given a light coating of lime water or other suitable release agent necessary to prevent from adhering. Diesel oil not allowed.

6.5 Placing. The asphalt mixture shall be spread on the approved prepared surface with a laydown machine or other approved equipment in such a manner such that when properly compacted, the finished surface will be smooth or uniform density, and meet the requirements of the typical cross sections as shown on the plans.

6.5.1 Flush Structures. Adjacent to flush curbs, gutters, liners and structures, the surface shall be finished uniformly high so that when compacted, it will be slightly above the edge of the curb and flush structure.

6.5.2 Construction joints of successive courses of asphaltic material shall be offset at least six inches. Construction joints on surface courses shall coincide with lane lines, or as directed by the Engineer.

6.6 Compacting. The asphalt mixture shall be compacted thoroughly and uniformly with the necessary rollers to obtain the required density and surface tolerances herein described and any requirements as shown on the plans. Regardless of the method of compaction control followed, all rolling shall be completed before the mixture temperature drops below 175 degrees F.

6.7 In-Place Density. In-place density control is required for all mixtures except for thin, irregular level-up courses. Material should be compacted to between 96% and 92% of maximum theoretical density or between 4% and 8% air voids. Average density shall be greater than 92% and not individual determination shall be lower than 90%. Testing shall be in accordance with TEX-207-F and TEX-227-F.

Pavement specimens, which shall be either cores or sections of the compacted mixture, will be tested as required to determine the percent air voids. Other methods, such as nuclear determination of in-place density, which correlate satisfactorily with actual project specimens may be used when approved by the Engineer.

6.8 Thickness. The total compacted average thickness of the combined HMAC courses shall not be less than the amount specified on the drawings. No more than 10% of the measured thicknesses shall be more than 1/4" less than the plan thickness(es). If so, the quantity for pay shall be decreased as deemed appropriate by the Engineer.

6.9 Surface smoothness criteria and tests. The pavement surface after compaction, shall be smooth and true to the established lines, grade, and cross-section. The surface shall be tested by the City with the Mays Roughness Meter.

6.10 The Mays Roughness Value for each block (intersection to intersection) or 600-foot section, whichever is the lesser, shall not exceed ninety inches per mile per traffic lane.

For each block of 600-foot section not meeting this criteria, the Engineer shall have the option of requiring that block or section to be reworked to meet the criteria, or paying an adjusted unit price for the surface course. The unit price adjustment shall be made on the following basis:

Adjusted Unit Price = (Adjustment Factor) X Surface Course Unit Bid Price

The adjustment factor shall be:

For Residential Streets:

Adjustment Factor = 1.999 - 0.0111 M

For All Other Class Streets (Non Residential)

Adjustment Factor = 1.287 - 0.0143 M

Where M - Mays Roughness Value

In no case shall the Contractor be paid more than the unit bid price. If the surface course is an inverted penetration (surface treatment) the Mays Roughness Value observed will be reduced by ten inches per mile, prior to applying the above criteria.

Localized Defects (obvious settlements, humps, ridges, etc.) shall be tested with a ten-foot straightedge placed parallel to the roadway centerline. The maximum deviation shall not exceed 1/8 inch in ten feet.

Areas not meeting this criteria shall be corrected to the satisfaction of the Engineer.

6.10 Opening to Traffic. The pavement shall be opened to traffic when directed by the Engineer. The Contractor's attention is directed to the fact that all construction traffic allowed on pavement open to the public will be subject to the State laws governing traffic on highways.

If the surface ravel, it will be the contractor's responsibility to correct this condition at his expense.

7. MEASUREMENT & PAYMENT

Unless indicated otherwise in the Proposal, Hot Mix Asphalt Pavement shall be measured by one of the following methods:

A. Measured by the square yard of the type and thickness of "Hot Mix Asphaltic Concrete" as shown on the plans.

B. Measured by the total weight of "Hot Mix Asphaltic Concrete" of the type specified on the plans delivered to the job site.

The Contractor shall provide the Engineer with copies of the "pay ticket" identifying the truck and showing the gross empty weight of the truck with driver as it arrives at the plant and the gross loaded weight of the truck with driver as it leaves the plant. The measured amount will be the difference of the loaded and empty trucks converted to tons. Payment shall be full compensation for quarrying, furnishing all materials, freight involved; for all heating, mixing, hauling, cleaning the existing base course or pavement, tack coat, placing asphaltic concrete mixture, rolling and finishing; and for all manipulations, labor, tools, equipment, and incidentals necessary to complete the work except prime coat when required.

The prime coat, performed where required, will be measured and paid for in accordance with the provisions governing the specification, Section 025412 "Prime Coat".

All templates, straightedges, scales, and other weights and measuring devices necessary for the proper construction, measuring and checking of the work shall be furnished, operated and maintained by the Contractor at his expense.

SECTION 025608  
INLETS (S-63)

1. DESCRIPTION

This specification shall govern for the construction of inlets complete in place and the materials used therein, including the installation, and the furnishing of frames, grates, rings and covers.

2. TYPES

The various types of inlets are designated on the plans by letters or by numbers indicating the particular design of each. Each type shall be constructed in accordance with the details shown on the plans and to the depth required by the profiles and schedules given.

3. MATERIALS

- (1) Concrete. Concrete for inlets shall be Class "A" concrete conforming to the requirements of the specification, Section 038000 "Concrete Structures", and the specification Section 030020 "Portland Cement Concrete", except as otherwise provided on the plans.
- (2) Mortar. Mortar shall be composed of one part Portland cement and two parts clean, sharp mortar sand suitable graded for the purpose by conforming in other respects to the provisions of the specification "Concrete for Structures" for fine aggregate. Hydrated lime or lime putty may be added to the mix but in no case shall it exceed 10 percent by weight of the total dry mix.
- (3) Reinforcing Steel. Reinforcing Steel shall conform to the requirements of the specification Section 032020 "Reinforcing Steel".
- (4) Concrete Blocks. Concrete blocks when shown on the plans shall conform to the requirements of ASTM Designation: C 139.
- (5) Frames, Grates, Rings and Covers. Frames, grates, rings and covers shall conform to the requirements of the specification Section 055420 "Frames, Grates, Rings and Covers".
- (6) Cast Iron. Cast iron for supports and inlet units shall conform to the shape and dimensions shown on the plans. The castings shall be clean and perfect, free from sand or blowholes, or other defects. Cast iron castings shall conform to the requirements of "Gray Iron Castings" ASTM Designation: A 48, Class 30.

4. CONSTRUCTION METHODS

- (1) General. All concrete work shall be performed in accordance with the requirements of the specification Section 038000 "Concrete Structures", unless otherwise specified. Forms will be required for all concrete walls, except where the nature of the surrounding material is such that it can be trimmed to a smooth vertical face.
- (2) Inlets for Precast Concrete Pipe Sewers. The construction of inlets for precast concrete pipe sewers shall be done as soon as is practicable after sewer lines in to or through inlet locations are completed. All sewers shall be cut neatly at the inside face of the walls of inlet and pointed up with mortar.



- (3) Inverts. The inverts passing out or through the inlet shall be shaped and routed across the floor of inlet as shown on the plans. This shaping may be accomplished by adding and shaping mortar or concrete after the base is cast or by placing the required additional material with the base.
- (4) Finishing Complete Inlets. Inlets shall be completed in accordance with the plans. Backfill to finish grade with native material, free of debris and compacted to over 95% Standard Proctor. Backfilling shall be in accordance with specification Section 022020 "Excavation and Backfill for Sewers".

#### 5. MEASUREMENT & PAYMENT

Unless indicated otherwise in the Proposal, inlets shall be measured as individual units by each inlet, complete.

Extension to inlets will be measured by each extension separately from the inlet.

Excavation, backfill, frames, grates, rings and covers will be considered subsidiary to the construction of the inlets.

Payment shall be full compensation for furnishing all concrete, reinforcing steel, mortar, castings, frames, grates, rings and covers and for all other materials, tools, equipment and incidentals required to perform the applicable work prescribed above.

SECTION 025610  
CONCRETE CURB AND GUTTER (S-52)

1. DESCRIPTION

This specification shall consist of Portland Cement combined concrete curb and gutter or separate concrete curb with or without reinforcing steel as required, constructed on an approved subgrade or foundation material in accordance with these specifications, in conformity with the lines and grades established by the Engineer and details shown on the plans.

2. MATERIALS

Unless otherwise specified on plans, materials and proportions for concrete used in construction under this specification shall conform the requirements as specified for Class "A" Concrete under specification, Section 030020 "Portland Cement Concrete". Reinforcing steel, if required, shall conform to the requirements as specified in the specification, Section 032020 "Reinforcing Steel". Expansion joint filler shall be redwood material meeting the requirements specified in specification, Section 038000 "Concrete Structures".

3. CONSTRUCTION METHODS

The foundation shall be excavated and shaped to line, grade per typical cross section, and hand tamped and sprinkled. If dry, the foundation material shall be sprinkled lightly immediately before concrete is deposited thereon.

Outside forms shall be of wood or metal, of a section satisfactory to the Engineer, straight, free of warp and a depth equal to the depth of the curb and gutter. They shall be securely staked to line and grade, and maintained in a true position during the depositing of concrete. Inside forms for the curb shall be approved material, shall be of such design as to provide the curb required and shall be rigidly attached to the outside forms.

The reinforcing steel shall be placed in position as shown on the typical sections. Care shall be exercised to keep all steel in its proper location.

Concrete for curb and gutter shall be mixed in a manner satisfactory to the Engineer. The curb and gutter shall be placed in sections of the length indicated on the plans, and each section shall be separated by a premoulded or board joint of cross section specified for the curb and gutter and of the thickness indicated on the plans.

After the concrete has been struck off and after it has become sufficiently set, the exposed surfaces shall be thoroughly worked with a wooden float. The exposed edges shall be rounded by the use of an edging tool to the radius indicated on plans. All exposed surfaces of curb and gutter, or curb, shall be brushed to a smooth and uniform surface.

The completed curb and gutter shall be cured with Type 2, white pigmented, curing compound unless shown otherwise on plans. Other methods of curing as outlined in the specification, Section 038000 "Concrete Structures" will be acceptable with a required curing period of 72 hours.

The curb and gutter shall be backfilled to the full height of the concrete, tamped and sloped as directed.

#### 4. MEASUREMENT & PAYMENT

Unless indicated otherwise in the Proposal, Concrete Curb and Gutter or Concrete Curb will be measured by the linear foot for each type of curb. Payment shall each be full compensation of preparing the subgrade; furnishing and placing all materials including reinforcing steel and expansion material; for furnishing, placing, shaping and tamping backfill; and for all manipulation, labor, tools, equipment and incidentals necessary to complete the work.

SECTION 025612  
CONCRETE SIDEWALKS AND DRIVEWAYS (S-53)

1. DESCRIPTION

The specification shall consist of sidewalks and driveways, with or without reinforcing steel, composed of Portland cement concrete, constructed as herein specified on an approved subgrade, in conformity with the lines and grades established by the Engineer and the details shown on the plans.

2. MATERIALS

Materials and proportions used in construction under this item shall conform to the requirements as specified for Class "A" concrete under the specification Section 030020 "Portland Cement Concrete". Reinforcing steel, if required, shall conform to the requirements as specified in the specification Section 032020 "Reinforcing Steel". Expansion joint filler shall be red wood or premoulded material meeting the requirements specified in the specification Section 038000 "Concrete Structures". Cap seal shall be Greenstreak or approved equal.

3. CONSTRUCTION METHODS

The subgrade shall be excavated, compacted and shaped to line, grade and cross-section and, hand tamped and sprinkled. The subgrade shall be moist at the time the concrete is placed.

Forms shall be of wood or metal, of a section satisfactory to the Engineer, straight, free from warp, and of a depth equal to the thickness of the finished work. They shall be securely staked to line and grade and maintained in a true position during the depositing of concrete.

The reinforcing steel, if required, shall be placed in position as shown on the plans. Care shall be exercised to keep all steel in its proper location.

Sidewalks shall be constructed in sections of the lengths shown on plans. Unless otherwise provided by the plans, no section shall be a length less than 8 feet and any section less than 8 feet shall be removed by the Contractor at his own expense.

The different sections shall be separated by a premoulded or board joint of the thickness shown on the plans, placed vertically and at right angles to the longitudinal axis of the sidewalks. Where the sidewalk or driveways abut a curb or retaining wall, approved expansion material shall be placed along their entire length. Similar expansion material shall be placed around all obstructions protruding through sidewalks or driveways.

Concrete shall be mixed in a manner satisfactory to the Engineer, placed in the forms to the depth specified and spaded and tamped until thoroughly compacted and mortar entirely covers the surface. The top surface shall be floated with a wooden float to a gritty texture. The outer edges and joints shall then be rounded with approved tools to the radii shown on plans.

Sidewalks shall be marked into separate sections, each 4 feet in length, by the use of approved jointing tools.

When completed, the sidewalks and driveways shall be cured with Type 2, white pigmented curing compound. Other methods of curing as outlined in the specification Section 038000 "Concrete Structures" will be acceptable with a required curing period of 72 hours.

#### 4. MEASUREMENT & PAYMENT

Unless indicated otherwise in the Proposal, Concrete Sidewalk and Driveway will be measured by the square foot of surface area of completed sidewalks, driveways, or sidewalks and driveways as indicated in the plans.

Payment shall each be full compensation for preparing the subgrade; for furnishing and placing all materials, including all reinforcing steel and expansion joint materials; and all manipulation, labor, tools, equipment and incidentals necessary to complete the work.

SECTION 025614  
CONCRETE CURB RAMPS

1. DESCRIPTION

This specification shall govern all work necessary for constructing Concrete Curb Ramps required to complete the project.

2. MATERIALS

Concrete shall be class "A" in accordance with Section 030020 of the Standard Specifications.

Reinforcement shall be 4x4 - W2.9 welded wire fabric in accordance with Section 032020 of the Standard Specifications.

Crushed granite shall be 1/2 inch, in accordance with AASHTO M43 Size Number 6.

3. CONSTRUCTION METHODS

The subgrade shall be shaped to line, grade, cross section, and shall be of uniform density and moisture, when concrete is placed. The subgrade shall be hand tamped and sprinkled to achieve the desired consistency and uniform support.

Ramps shall be constructed of Class A concrete to line and section as shown on the plans. Unless shown otherwise on the Drawings, ramps shall have a minimum concrete thickness in excess of 4", prior to application of exposed aggregate surface texture.

Slopes, S, shall be as follows unless shown otherwise on the Drawings:

RAMPS

Ramp in direction of travel . . . . .	$S \leq 1:12$
Side slope of ramp (flare) . . . . .	$S \leq 1:10$
Cross Slope . . . . .	$1:100 \leq S \leq 1:50$

ADJOINING AREAS

Landings adjacent to ramp . . . . .	$S \leq 1:20$
Driveways abutting tied sidewalk . . . . .	$S \leq 1:10$

Width of ramp shall be 36", exclusive of flare, unless shown otherwise in the Drawings. No ramp shall be less than 36" wide.

Obstructions shall be removed or relocated, as appropriate, or the location of the ramp may be shifted, if authorized.

Surfacing shall be either crushed granite with regular concrete or crushed limestone with colored concrete. If colored concrete is used it shall be Lambert [Light Buff] or [Jet Black]. Surfacing shall be applied to all curb ramp surfaces, including side flares, in accordance with Section 097020 of the Standard Specification. Surfacing shall be flush with abutting areas and placed using a template as required to achieve an esthetic well-defined edge. Surfacing shall be subsidiary work and not be measured for separate pay. Abutting curbs, sidewalks, gutters, driveways, etc. shall not receive granite surfacing.

Pavement Markings for street crossings shall be placed such that the crosswalk is properly aligned with respect to the curb ramp. See striping details for proper alignment of striping with respect to intersection and curb ramp. Properly constructed curb ramp shall be true to line, section, grade and shall be free of loose granite surfacing and irregularities.

4. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, Concrete curb ramps shall be measured by the horizontal square foot of ramp surface area, including side flares when used. Adjoining curbs, gutters, sidewalks, and driveways will be excluded from said measurement. Measurement shall include, but not be limited to subgrade prep, form-work, concrete, rebar, granite surfacing, borders, molding and curing required to complete the curb ramp. Payment shall include all labor, materials, equipment and other incidentals required to complete the concrete curb ramp complete in place and will be made at the unit price bid for Concrete Curb Ramps when included in the proposal.

SECTION 025802  
TEMPORARY TRAFFIC CONTROLS DURING CONSTRUCTION

1. DESCRIPTION

This specification shall govern all work required for Temporary Traffic Controls during construction. The work shall include furnishing, installing, moving, replacing, and maintaining all temporary traffic controls including, but not limited to, barricades, signs, barriers, cones, lights, signals, temporary detours, temporary striping and markers, flag-men and such temporary devices and relocation of existing signs and devices as necessary to safely complete the project.

2. MATERIALS

Traffic control devices shall conform to the latest edition of Texas Manual on Uniform Traffic Control Devices, unless indicated otherwise, in the Traffic Control Plans.

3. METHODS

Sufficient traffic control measures shall be used to assure a safe condition and to provide a minimum of inconvenience to motorists.

The Traffic Control Plan (TCP) shall be provided by the Contractor and submitted to the Traffic Engineer for approval, prior to construction.

A competent person, responsible for implementation of the TCP and for traffic safety, shall be designated by the Contractor.

The name and off-hours phone number of the competent person shall be provided in writing at the Pre-Construction Conference.

The competent person shall be on site, during working hours and on call in the event of off-hour emergency.

4. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, Temporary Traffic Controls shall be subsidiary to the project.

If included as a bid item in the Proposal, Temporary Traffic Controls shall be measured as a lump sum. Payment shall include, but not be limited to, furnishing, installing, moving, replacing, and maintaining all temporary traffic controls including, but not limited to, barricades, signs, barriers, cones, lights, signals, temporary striping and markers, flag-men and such temporary devices and relocation of existing signs and devices and all materials, labor, equipment, and incidentals necessary to provide a safe condition and to complete the work.

Payment shall be made on the following basis: the initial monthly estimate will include 50% of the lump sum bid minus retention (typically 5%). The balance will be paid with the final estimate, upon completion of the project.



## TRAFFIC SIGNAL ADJUSTMENTS

### 025803.1 DESCRIPTION

This specification shall govern all work for Traffic Signal Adjustments required to complete the project.

### 025803.2 MATERIALS

All equipment and materials for adjustments shall be provided by the Contractor, unless indicated otherwise on the drawings.

### 025803.3 METHODS

The existing signal controls shall be maintained by the Contractor.

Transferring control of the adjusted signal control shall be done by the Contractor.

A minimum of 48 hour advance notice shall be provided to the Engineer (City Traffic Engineer) by the Contractor, prior to transferring control of the adjusted signal control or any other interim signal adjustments necessary to control traffic, unless otherwise noted on the drawings.

Manual traffic direction by the City Police Department shall be arranged and provided for by the Contractor at any signalize intersection at any time that sign control must be interrupted. The Contractor shall arrange for a representative from the City's Traffic Signals Division to be on site to inspect the process of signal control transfer, during the work.

### 025803.4 MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, Traffic Signal Adjustments will not be measured for pay, but shall be considered subsidiary to other work.

SECTION 025805  
ABBREVIATED PAVEMENT MARKINGS (S-101)

1. Scope. This specification covers the placement; maintenance and removal of abbreviated markings, which are to be placed on roadways which, are open to traffic as required to complete the project.
2. General Requirements. The pavement-marking material shall consist of an adhesive-backed reflective tape that can be applied to the pavement, Scotch-Lane Series A200 or approved equal. Markings shall be of good appearance, have straight, unbroken edges and have a color that complies with all FHWA regulations.
3. Dimensions. Pavement markings shall be minimum of 3-7/8 inches wide. Lengths and spacing will be as specified.
4. Color. The markings, as well as retroreflected light from the markings, shall be white or yellow as called for in the plans.
5. Visibility. When dry, the pavement markings (during daylight hours) shall be distinctively visible for a minimum of 300 feet.

When dry, the pavement markings (when illuminated by automobile low-beam headlights at night) shall be distinctively visible for 160 feet.

The above day and night visibility requirements shall be met when viewed from an automobile traveling on the roadway.

6. Placement and Maintenance. At sunrise and sunset of each day, abbreviated markings meeting all specifications requirements shall be in place on all roadways on which traffic is allowed and where suitable standard pavement by the markings is not in place. The transverse location of the line(s) formed by the markings shall be as determined by the Engineer.

Unless otherwise shown on the plans, the abbreviated markings shall be placed as follows:

<u>Condition</u>	<u>Spacing</u>	<u>Length of Stripe</u>
Straight	80 feet (approx.)	24 inch
Curve ≤ 2'	80 feet (maximum)	24 inch
Curve > 2'	40 feet (maximum)	24 inch

The spacing of stripe may be modified by the Engineer. However, the maximum spacing specified above shall not be exceeded in any case.

The Contractor will be responsible for maintaining the abbreviated pavement markings, until standard pavement markings are in place.

7. Removal. Where removal is required, it will be accomplished in accordance with instructions of the Engineer or as called for in the plans.
8. Measurement & Payment Unless indicated otherwise in the Proposal, Abbreviated pavement markings shall be measured by the linear foot of markings placed. Payment shall be full compensation for furnishing all materials, labor, tools, equipment and incidentals necessary to place the markings and for maintaining and removing and markings as required.

SECTION 025807  
PAVEMENT MARKINGS (S-45)  
PAINT AND THERMOPLASTIC

1. DESCRIPTION

This item shall consist of markings and stripes on the surface of the roadways applied in accordance with these specifications and at the locations shown on the plans or as directed by the Engineer.

2. MATERIALS

Paint shall be Type F per AASHTO M248.

Thermoplastic shall be in accordance with AASHTO M 249.

3. CONSTRUCTION METHODS

3.1 Weather Limitations - The marking shall be performed only when the existing surface is dry and clean, when the atmospheric temperature is above 40°F., and when the weather is not excessively windy, dusty, or foggy. The suitability of the weather will be determined by the Engineer.

3.2 Equipment - All equipment for the work shall be approved by the Engineer and shall include the apparatus necessary to properly clean the existing surface, and mechanical marking machine, and such auxiliary hand marking equipment as may be necessary to satisfactorily complete the job.

The mechanical marker shall be an approved atomizing spray-type marking machine. It shall produce an even and uniform film thickness at the required coverage and shall be designed so as to apply markings of uniform cross sections and clear-out edges without running or spattering and within the limits for straightness set forth herein.

Suitable adjustments shall be provided on the sprayer (s) of a single machine or by furnishing additional equipment for marking the width required.

3.3 Preparation of Existing Surface - Immediately before application of the paint, the existing surface shall be dry and entirely free from dirt, grease, oil, acids, laitance, or other foreign matter which would reduce the bond between the marking and the pavement. The surface shall be thoroughly cleaned by sweeping and blowing as required to remove all dirt, laitance, and loose materials. Areas which cannot be satisfactorily cleaned by brooming and blowing shall be scrubbed as directed with a water solution of trisodium phosphate (10% Na<sub>3</sub>PO<sub>4</sub> by weight) or an approved equal solution. After scrubbing, the solution shall be rinsed off and the surface dried prior to marking.

3.4 Layouts and Alignments - Suitable layouts and lines of proposed stripes shall be spotted in advance of the marking application. Control points shall be spaced at such intervals as will insure accurate location of all markings.

The Contractor shall provide an experience technician to supervise the location, alignment, layout, dimensions, and application of the

marking.

- 3.5 Application - Marking shall be applied at the locations and to the dimensions and spacing indicated on the plans or as specified. Paint shall not be applied until the layouts, indicated alignment, and the condition of the existing surface have been approved by the Engineer.

In the application of straight stripes, any deviation of the edges exceeding  $\frac{1}{4}$  inch in 50 feet shall be obliterated and the marking corrected. The width of the markings shall be as designated within a tolerance of 5%. All marking shall be performed to the satisfaction of the Engineer.

Paint shall be applied uniformly by suitable equipment at a rate of not less than 105 nor more than 115 square feet per gallon.

The Contractor shall furnish a certified report on the quality of materials ordered for the work. This report shall not be interpreted as a basis for final acceptance. The Engineer shall be notified upon arrival of shipment or inspecting and sampling of the materials. When required, all emptied containers shall be returned to the paint material storage or made available for tallying by the Engineer. The containers shall not be removed from the job site or destroyed without permission. The Contractor shall make an accurate accounting of the paint materials used in the accepted work.

- 3.6 Protection - After application, all markings shall be protected while the drying. The fresh markings shall be protected from damage of any kind. The Contractor shall be directly responsible and shall erect or place suitable warning signs, flags or barricades, protective screens, or coverings as required. All surfaces shall be protected from disfiguration by spatter, splashes, spillage, drippings of paint or other materials.
- 3.7 Defective Workmanship or Material - When any material not conforming to the requirement of the specifications or plans has been delivered to the project or incorporated in the work or any work performed is of inferior quality, such material or work shall be corrected as directed by the Engineer, at the expense of the Contractor.

#### 4. MEASUREMENT & PAYMENT

Unless indicated otherwise in the Proposal, Pavement Markings shall be measured by the square foot of each type of marking. Payment shall be full compensation for furnishing all materials and for all preparation, layout, and application of the materials, and for all labor, equipment, tools and incidentals necessary to complete the work.

SECTION 025813  
PREFORMED STRIPING & EMBLEMS

1. DESCRIPTION

This specification shall govern all work for furnishing and installing preformed striping & emblems required to complete the project.

2. PRECONSTRUCTION CONFERENCE

When required by the Engineer, prior to beginning work on the markings but after receipt by the Engineer of the information referred to in (1) above, a conference will be held between the representatives of the Contractor and the Engineer to set up more completely the sequence of work to be followed and the estimated progress schedule.

3. MATERIALS

The pavement marking material shall be the exact 3M Brand [Stamark] material specified on the plans and specifications, with pressure sensitive adhesive, conforming to the [Specification for Durable Retro Reflective Preformed Pavement Markings], attached at the end of this specification.

4. CONSTRUCTION

- (1) General. The Contractor shall furnish all materials and equipment and, perform work or services necessary for complete and proper construction of the completed system of pavement markings.
- (2) Traffic Conditions. Roadways on which markings are to be placed may be either free of or open to traffic. On roadways already open to traffic, markings will be placed under existing traffic conditions.
- (3) Dimensions. Markings will be in accordance with the color, length, width, shape, configuration and location requirements of the plans and as directed by the Engineer.
- (4) Methods. All material placement will be in accordance with the 3M Company manufacturer's instructions. Installation of the material may be by either [inlaid] or [overlaid] application. In addition to the manufacturer's instructions, material placement will be in accordance with surface condition requirements moisture and temperature requirements listed below. A 3M Company representative shall be present at the time of application to provide technical assistance and quality control of the material installation.
- (5) Surface Preparation. The pavement upon which the pavement markings are to be placed shall be cleaned and prepared, prior to placement of the markings. Cleaning shall be by any effective method that completely and effectively removes contaminants, loose materials, and conditions deleterious to proper adhesion. Surfaces shall be further prepared after cleaning by sealing or priming, as recommended by the manufacturer of the pavement marking material. Adhesive shall be of the type and quality recommended by the manufacturer of the pavement marking material.
- (6) Moisture. Pavement to which material is to be applied shall be completely dry. When questionable, pavements will be considered dry if, on a sunny day after observation for 15 minutes, no condensation occurs on the underside of a 1 square foot piece of clear plastic that has been placed on the pavement and weighted down on the edges.
- (7) Temperature. Pavement and ambient air temperature requirements recommended by the material manufacturer will be observed. If no temperature requirements are established by the materials manufacturer, material will not be placed if the pavement temperature is below 60F or if it is above 120F.
- (8) Clean Up. At all times, the project site will be kept free of all

unnecessary traffic hazards. Upon completion of the work, the Contractor shall remove all rubbish from the work site, and shall clean and restore the area to a manner acceptable to the Engineer. Also, all damage done by the Contractor during the prosecution of the work must be repaired. Before acceptance, the work site must be neat and in a presentable condition throughout. No extra compensation will be allowed for fulfilling these clean-up requirements.

5. PERFORMANCE

- (1) Adhesion. Installed pavement markings shall adhere to the pavement sufficiently to prevent lifting, shifting, smearing, spreading, flowing or tearing by traffic.
- (2) Appearance. In addition to complying with all requirements listed herein, pavement markings shall present a neat, uniform appearance, and shall be free of unsightly conditions caused by spread of excess adhesive. Markings shall be free of ragged edges and misshapen lines or contours, and splices in transverse markings.
- (3) Visibility. The pavement marking material, in place on the roadway, shall have uniform and distinctive retro reflectance when observed in accordance with Texas Test Method Tex-828-B.
- (4) Observation Period. All material, workmanship and labor furnished shall be covered by manufacturer's guarantee and/or warranty for a period of 12 months commencing on final delivery date of materials.

Pavement markings that fail to meet all requirements of this specification shall be removed and replaced at the expense of the Contractor. The Contractor shall replace all pavement markings failing the requirements of this specification within 30 working days following notification by the Engineer of such failing. All replacement pavement markings shall also meet all requirements of this specification for the same warranty period after installation.

6. MEASUREMENT & PAYMENT

Unless indicated otherwise in the Proposal, Preformed Striping and Emblems shall be square foot for each type and colour indicated in the Proposal. Payment shall be full compensation for cleaning the pavement by any suitable means other than blast cleaning, for furnishing and placing all materials, and for all labor, tools, equipment and incidentals necessary to complete the work.

RAISED PAVEMENT MARKERS AND TRAFFIC BUTTONS

025816.1 DESCRIPTION

This specification shall govern all work required for furnishing and installing Raised Pavement Markers and Traffic Buttons required to complete the project.

025816.2 MATERIALS

RAISED PAVEMENT MARKERS shall conform to 025818 TxDOT Department Material Specification: D-9-4200, "Pavement Markers (Reflectorized)".

TRAFFIC BUTTONS shall conform to 025820 TxDOT Department Material Specification: D-9-4300, "Traffic Buttons".

Unless indicated otherwise on the drawings, Raised Pavement Markers and Traffic Buttons shall be of the type to be applied to the roadway surface with a non-integral adhesive. Types of Raised Pavement Markers and Traffic Buttons shall be as follows:

<u>TYPE</u>	<u>DESCRIPTION</u>
I-A	One face shall reflect amber light and the body other than the reflective face shall be yellow.
I-C	One face shall reflect white light and the body other than the reflective shall be white, silver, or light gray.
I-R	One face shall reflect red light and the body other than the reflective face shall be white, silver, or light gray or may be one-half red on the side that reflects red light.
II-A-A	Two reflective faces, each of which shall reflect amber light and the body other than the reflective faces shall be yellow.
II-B-B	Two reflective faces, each of which shall reflect blue and the body other than the reflective faces shall be blue. Fire Hydrant Application
II-C-C	Two reflective faces, each of which shall reflect white light and the body other than the reflective faces shall be white, silver, or light gray.
II-C-R	Two reflective faces, one of which reflects white light and one that reflects red light; the body other than the reflective faces shall be white, silver, or light gray or may be one-half red on the side that reflects red light.
W	Shall be non-reflectorized white body Traffic Button.
Y	Shall be non-reflectorized yellow body Buttons.

ADHESIVE for securing Raised Pavement Markers and Traffic Buttons to asphalt or concrete surfaces shall conform to 025828 TxDOT Department Materials Specification D-9-6130 BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS.

025816.3 METHODS

PAVEMENT SURFACE to receive button shall be prepared such that the surface is free of loose material, grease, moisture, and other foreign material that would impair bond with adhesive.

ALIGNMENT AND POSITIONING of markers and buttons shall be such that reflective

faces are aligned for proper visibility.

ADHESIVE shall be applied such that 100% of the lower surface of the marker or button is in contact with the adhesive and in sufficient quantity to serve as a cushion between the marker or button and the paved surface. Any surplus adhesive shall be removed so that the visibility of the marker or button is not impaired.

025816.4 MEASUREMENT AND PAYMENT

Raised Pavement Markers and Traffic Buttons shall be measured as individual units for each type installed, if included as a bid item in the proposal. Payment shall include, but not be limited to, furnishing and installing markers or buttons complete with adhesive, all labor, materials, equipment, and incidentals required to complete the work.



SECTION 025818  
PAVEMENT MARKERS (REFLECTORIZED)  
(TxDOT D-9-4200)

1. DESCRIPTION

This specification shall govern for the materials, composition, quality, sampling and testing of pavement markers (reflectorized) as specified hereinafter.

2. BIDDER'S AND/OR SUPPLIER'S REQUIREMENTS

All prospective bidders and/or suppliers are hereby notified that before any material is considered, it shall be of design and shape shown or previously approved by the Engineer.

3. PAYMENT

- A. Procurement by the State: Payment for all materials under this specification shall be in accordance with the conditions prescribed in the contract awarded by the State.
- B. Contracts: All materials under this specification utilized by the Contractor shall be paid for in accordance with the Item [Pavement Markers (Reflectorized)].

4. SAMPLING AND TESTING

Sampling and testing shall be in accordance with the State Department of Highways and Public Transportation, Materials and Tests Division Manual of Testing Procedures.

Costs of sampling and testing are normally borne by the Department. However, the costs of sampling and testing of materials failing to conform with the requirements of this specification shall be borne by the Contractor or Supplier. Costs of sampling and testing failing material shall be assessed at the rate established by the Materials and Tests Engineer, and in effect at the time of testing. Amounts due the Department for conducting such tests will be deducted from monthly or final estimates on contracts or from partial or final payments on direct purchases by the State.

5. MATERIAL REQUIREMENTS

This specification covers the general and specific requirements for two classes and eight types of pavement markers, reflectorized. Pavement markers, reflectorized, shall meet all requirements of this specification, except when specific requirements are shown for a specific class or type.

- A. Classes:
  - 1. Class A: Class A pavement markers are those markers to be applied to the roadway surface with an adhesive, such as epoxy.
  - 2. Class B: Class B pavement markers are those markers to which an adhesive pad is affixed for the purpose of adhering the pavement marker to the roadway surface.
- B. Types:
  - 1. Type I-A: Shall contain one face that reflects amber light and the body other than the reflective face shall be yellow.

2. Type I-C: Shall contain one face that reflects white light and the body other than the reflective face shall be white, silver white or light gray.
3. Type I-R: Shall contain one face that reflects red light and the body other than the reflective face shall be white, silver white, or light gray or may be one-half red on the side which reflects red light.
4. Type II-A-A: Shall contain two reflective faces, each of which shall reflect amber light and the body other than the reflective faces shall be yellow.
5. Type II-C-C: Shall contain two reflective faces, each of which shall reflect white light and the body other than the reflective faces shall be white, silver white or gray.
6. Type-II-C-R: Shall contain two reflective faces, one of which reflects white light and one of which reflects red light; the body other than the reflective faces shall be white, silver white or light gray or may be one-half red on the side that reflects red light.

The reflective faces of the Type II markers shall be located so that the direction of reflection from one face shall be directly opposite to the direction of reflection of the other face.

### 3. DESIGN AND SHAPE REQUIREMENT

1. Outer Surface: The outer surface of the pavement marker shall be smooth except for the molding or stamping of the manufacturer's name. All corners and edges exposed to traffic must be rounded. The interface between the reflective faces and body of the marker shall be solid.
2. Bottom:
  - a. Class A: The bottom surface of the Class A pavement marker shall have a minimum roughness comparable to that of fine sandpaper, but shall not be of such roughness or grooved such that air will be entrapped when pressed into the adhesive.
  - b. Class B: A 100 percent solids pressure sensitive adhesive shall be firmly adhered to the bottom of the markers. The adhesive layer shall be approximately 0.06 inch thick and covered with release paper. The bottom surface of the markers, exclusive of the pressure-sensitive adhesive, shall not deviate from a true plane more than 0.05 inch.
3. Reflective Face: The angle formed by the reflective face or faces and the plane of the bottom surface shall not exceed 30 degrees.

### 4. OPTICAL REQUIREMENT

- A. Optical Performance: The reflective device(s) shall be capable of providing reflection of amber, red or white light as required by the

requisition or plans. The reflective light of each reflective face shall conform to the minimum reflective intensity requirements as follows:

SPECIFIC INTENSITY PER REFLECTIVE FACE AT 0.2° OBSERVATION

<u>Horizontal Entrance Angle</u>	<u>Crystal</u>	<u>Amber</u>	<u>Red</u>
4°	3.00	2.00	0.40
20°	1.50	1.00	0.20

Horizontal entrance angle shall mean the angle, in a plane parallel to the base of the marker, between a line in the direction of the incident light and a line perpendicular to the leading edge of the reflective surface.

Observation angle shall mean the angle at the reflector between observer's line of sight and the direction of the light incident on the marker.

Specific intensity shall mean candlepower of the returned light at the chosen observation and entrance angles for each foot candle of incident light per reflective face. Test Method Tex-842-B will be used to determine specific intensity.

The specific intensity of the pavement marker shall not be less than 80 percent of its initial value after being subjected to the heat test in Section 5.B., below.

5. PHYSICAL REQUIREMENTS

- A. Impact Resistance. The marker shall be tested for quality according to Test Method Tex-403-A [Method for Testing the Impact Resistance of Pavement Markers.]

Criteria for acceptance by the impact resistance requirement shall as follows: b

Definition: Any individual marker shall be considered failing if it breaks, cracks or is significantly deformed by the test.

A set of five markers shall be subjected to the impact resistance test. If all five markers pass the test, the sample is acceptable.

If two or more of the five markers fail the test, the sample shall be rejected. If one of the five markers fail, then a retest will be made on five additional markers from the same sample. If none of the markers from the retest fail, then the sample will be considered passing the impact resistance requirement.

- B. The marker shall show no change in shape or color when subjected to the requirements of Test Method Tex-846-B. The temperature shall be 140 F with the marker in a vertical position.

C. Adhesion Requirement:

1. Class A: The Class A pavement marker shall be tested in accordance with Test Method Tex-611-J. Unless otherwise specified, the following shall be the criteria for acceptance:

The five specimens tested must evidence a minimum average bond

strength of 500 psi. In addition, no more than one individual specimen may evidence a bond strength less than 500 psi. If the average bond strength is less than 500 psi, or two or more individual specimens evidence a bond strength less than 500 psi, the lot represented by the samples shall be rejected.

2. Class B: The Class B pavement marker shall comply with the following adhesion requirements, when tested as follows.

A 4" x 4" x 1/4" steel plate with 1/2" nut welded to the center of the back side shall be sandblasted and coated with the primer recommended by the supplier. After the primer has dried, the adhesive surface of the marker shall be placed against the primed surface and a compressive load of  $90 \pm 5$  psi applied to the marker and plate for 10 seconds to obtain good contact. A steel fixture of the type used in Test Method Tex-611-J shall be bonded to the top surface of the marker with epoxy adhesive. After 24 hours, self-aligning straps shall be attached to the composite specimens and they shall be loaded in tension at a cross-head speed of  $2.0 \pm 0.2$  inches per minute until failure occurs. Preparation and testing shall be in a laboratory with ambient temperature maintained between 70 and 80 F.

Five specimens shall be tested. The average bond strength shall be at least 20 psi. No more than one individual specimen may evidence a bond strength of less than 20 psi, therefore if two or more individual specimens evidence a bond strength of less than 20 psi, the lot represented by the samples shall be rejected.

SECTION 025820  
TRAFFIC BUTTONS  
(TxDOT D-9-4300)

1. DESCRIPTION

This specification shall govern for the materials, composition, quality, sampling and testing of ceramic traffic buttons, reflectorized or nonreflectorized types as specified hereinafter.

2. BIDDER'S AND/OR SUPPLIER'S REQUIREMENTS

All prospective bidders and/or suppliers are hereby notified that before any material is considered, it shall be of design and shape as shown or previously approved by the Engineer.

3. PAYMENT

- A. Procurement by the State: Payment for all materials under this specification shall be in accordance with the conditions prescribed in the contract awarded by the State.
- B. Contracts: All materials under this specification utilized by the Contractor shall be paid for in accordance with the Item "Traffic Button".

4. SAMPLING AND TESTING

Sampling and testing shall be in accordance with the State Department of Highways and Public Transportation, Materials and Tests Division Manual of Testing Procedures.

Costs of sampling and testing are normally borne by the Department. However, the costs of sampling and testing of materials failing to conform with the requirements of this specification shall be borne by the Contractor or Supplier. Costs of sampling and testing failing material shall be assessed at the rate established by the Materials and Tests Engineer, and in effect at the time of testing. Amounts due the Department for conducting such tests will be deducted from monthly or final estimates on contracts or from partial or final payments on direct purchases by the State.

5. MATERIAL REQUIREMENTS

This specification covers the general and specific requirements for ceramic traffic buttons, reflectorized and nonreflectorized as specified in the plans/invitation to bid. All traffic buttons shall meet the requirements of this specification, except for nonreflectorized type traffic buttons which shall not be subject to reflective requirements.

A. Types of Traffic Buttons:

- 1. Reflectorized: Reflectorized traffic buttons shall be of the following types:
  - a. Type I-A: Shall contain one face that reflects amber light and the body other than the reflective face shall be yellow.

- b. Type I-C: Shall contain one face that reflects white light and the body other than the reflective face shall be white.
  - c. Type I-R: Shall contain one face that reflects red light and the body other than the reflective face shall be white.
  - d. Type II-A-A: Shall contain two reflective faces oriented 180° to each other, each of which shall reflect amber light, and the body other than the reflective faces shall be yellow.
  - e. Type II-C-C: Shall contain two reflective faces oriented 180° to each other each of which shall reflect white light and the body other than the reflective faces shall be white.
  - f. Type II-A-C: Shall contain two reflective faces oriented 180° to each other, one of which shall reflect amber light and one of which shall reflect white light; the body other than the reflective faces shall be white.
  - g. Type II-A-R: Shall contain two reflective faces oriented 180° to each other, one of which reflects amber light and one of which reflects red light; the body other than the reflective faces shall be yellow.
  - h. Type II-C-R: Shall contain two reflective faces oriented 180° to each other, one of which reflects white light and one of which reflects red light. The body of the button other than the reflective face shall be white.
2. Nonreflectorized: Nonreflectorized traffic buttons shall be of the following types:
- a. Type W: Type W shall have a white body.
  - b. Type Y: Type Y shall have a yellow body.
- B. Appearance Requirements: The top and sides of the button shall be smooth and free from surface irregularities, pits, cracks, checks, chipping, discoloration and any other defects which adversely affect appearance and application.
- The bottom of the buttons may be of a rough texture, free from glass, glaze or any other substance that may reduce its bond to the adhesive. Excluding any protrusions which are intentionally manufactured as functional characteristics of the button, the base shall not deviate from a true plane by more than 1/16 inch.
- C. Color Requirements: The diffuse day color shall comply with the following specified color requirements. Color requirements are defined by an enclosed area formed by using the following CIE Chromaticity Coordinates as corner points and the listed Y reflectance limits.

CHROMATICITY COORDINATES AND REFLECTANCE LIMITS

<u>Color</u>	<u>Chromaticity Points</u>		<u>Reflectance Limits</u>
	<u>x</u>	<u>y</u>	<u>Y</u>
White	0.290	0.316	70 minimum
	0.310	0.296	
	0.330	0.321	
	0.310	0.342	
Yellow	0.448	0.455	38.0 - 60.0
	0.468	0.420	
	0.544	0.456	
	0.516	0.484	

Individual yellow traffic buttons in any shipment or lot shall not have a variance in chromaticity coordinates x and y, greater than 0.025 units, nor shall the variance in reflectance exceed 6.0 units. Color shall be determined in accordance with Test Method Tex-839-B.

D. Optical Requirements for Reflectorized Traffic Buttons:

1. Reflective Device(s): Reflective buttons shall have an approved reflective device(s) inserted in a protective ramp and adhered to a recess in the ramp base. The reflective device(s) shall be as shown in the plans/invitation to bid.
2. Optical Performance: The reflective device(s) shall be capable of providing reflection of amber, red or white light as required by the requisition or plans. The reflective

light of each reflective face shall conform to the minimum reflective intensity requirements as follows:

SPECIFIC INTENSITY PER REFLECTIVE FACE AT 0.2° OBSERVATION ANGLE

<u>Horizontal Entrance Angle</u>	<u>Crystal</u>	<u>Amber</u>	<u>Red</u>
4°	3.00	2.00	0.40
20°	1.50	1.00	0.20

Horizontal entrance angle shall mean the angle, in a plane parallel to the base of the marker, between a line in the direction of the incident light and a line perpendicular to the leading edge of the reflective surface.

Observation angle shall mean the angle at the reflector between observer's line of sight and the direction of the light incident on the traffic button.

Specific intensity shall mean candlepower of the returned light at the chosen observation and entrance angles for each foot candle of incident light per reflective face. Test Method Tex-842-B will be

used to determine specific intensity.

E. Physical Requirements: All traffic buttons shall meet the following requirements.

1. Glaze Thickness: The glazed surface top and sides shall have a mean thickness not less than 0.005 inch when measured not closer than 1/4 inch from the edge of the button. The thickness shall be measured on a fractured edge with a calibrated scale microscope.
2. Autoclave: The ceramic glaze shall not discolor, craze, spall or peel when subjected to one cycle of the autoclave test at 250 psi. Test shall be in accordance to ASTM C 424.
3. Water Absorption: The water absorption of the traffic buttons shall not exceed 1.0 percent of the original dry weight when tested in accordance with ASTM designation: C 373. Specimens may be broken pieces taken from the strength test.
4. Strength Requirement: Traffic buttons shall be subjected to the compressive load test as follows:
  - a. Four (4) inch nominal diameter buttons: A random sample of five (5) buttons shall be tested in accordance with Test Method Tex-434-A. Buttons tested shall have a compressive (breaking) strength as follows:

1500 pounds load, minimum average of five units  
1200 pounds load, minimum for any individual unit
  - b. Large diameter traffic buttons: The compressive (crushing) strength shall be determined on a one inch diameter right cylinder test specimen, cut through the center portion of the button by core drilling. The specimen top and bottom surfaces shall be capped with high-strength capping compound to make them perpendicular to the axis of the specimen. The compressive strength shall be as follows:

6,000 psi, minimum average of five units  
5,000 psi, minimum for any individual unit
5. Adhesion: The traffic buttons shall be tested in accordance with Test Method Tex-611-J.

Unless otherwise specified, the following shall be the criteria for acceptance:

The five specimens tested must evidence a minimum average bond strength of 500 psi. In addition, no more than one individual specimen may evidence a bond strength less than 500 psi. If the average bond strength is less than 500 psi, or two or more individual specimens evidence a bond strength less than 500 psi, the lot represented by the samples shall be rejected.



SECTION 025828  
 BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS  
 (TxDOT D-9-6130)

1. DESCRIPTION

This item establishes the requirements for bituminous type hot-melt adhesive to be used for placement of pavement markers. The adhesive shall be suitable for bonding ceramic and plastic markers to portland cement concrete, asphaltic concrete, and chip-sealed road surfaces and applicable when road surface and marker temperatures are in the approximate range of 40 F to 160 F. The composition of the adhesive must be such that its properties will not deteriorate when heated to and applied at temperatures up to 425 F using either air or oil-jacketed melters.

2. MATERIAL REQUIREMENTS

The adhesive shall be an asphaltic material with homogeneously mixed mineral filler and shall comply with the following requirements:

A. Adhesive Properties

<u>Property</u>	<u>Min</u>	<u>Max</u>	<u>Method</u>
Softening Point, deg F	200	-	ASTM D 36
Penetration, 100 g, 5 sec, 77F	10	20	ASTM D 5
Flow, inch	-	0.2	ASTM D 3407, as modified in Test Methods
Heat Stability Flow, inch	-	0.2	As in Test Methods
Viscosity, 400 F, Poises	-	75	ASTM D 2669, as modified in Test Methods
Flash Point, C.O.C., deg F	550	-	ASTM D 92

B. Asphalt properties determined on the filler-free material derived from the extraction and Abson recovery process as explained in Test Methods.

<u>Property</u>	<u>Min</u>	<u>Max</u>	<u>Method</u>
Penetration, 100 g, 5 sec, 77 F	25	-	ASTM D 5
Viscosity, 275 F, Poises	12	-	ASTM D 2171
Viscosity Ratio, 275 F	-	2.2	As explained in Test Methods

C. Filler properties determined using the filler separation technique described in Test Methods.

<u>Property</u>	<u>Min</u>	<u>Max</u>	<u>Method</u>
Filler content, percent by weight	50	75	As in Test Methods
Filler Fineness, percent passing			ASTM C 430, as modified in Test Methods
No. 325	75	-	
No. 200	95	-	
No. 100	100	-	

3. TEST METHODS

- A. Flow shall be determined according to Section 6, Flow, of ASTM D 3407 with the exception that the oven temperature shall be  $158 \pm 2$  F and sample preparation shall be according to Section 7.1 of ASTM D 5.
- B. Heat Stability Flow shall be determined according to Flow with the exception that 1000 grams of adhesive shall be placed in a loosely-covered quart can, heated to 425 F and maintained at this temperature for four hours prior to preparing the sample panel.
- C. Viscosity is to be determined according to ASTM D 2669 using a spindle speed of 10 rpm. The adhesive shall be heated to approximately 410 F and allowed to cool. Viscosity shall be determined at  $400 \pm 1$  F.
- D. Properties of the base asphalt are to be determined on the material obtained from the following extraction and Abson recovery methods. The asphalt shall be extracted by heating the adhesive just to the point where it will easily flow and then transferring 125 to 150 grams into 400 ml of trichloroethylene with a temperature of 125 to 150 F. This mixture shall be thoroughly stirred to dissolve the asphalt. The trichloroethylene-asphalt mixture shall be decanted and the asphalt shall be recovered using the Abson recovery methods, ASTM D 1856 as modified by the following. The extraction methods of ASTM D 2712 shall not apply and there shall be no filtration of the solvent-asphalt mixture. The extraction solution of trichloroethylene and asphalt shall be centrifuged for at least 30 minutes at 770 times gravity in a batch centrifuge. Decant this solution into the distillation flask, taking care not to include any filler sediment. Apply heat and bubble carbon dioxide slowly to bring the solution temperature to 300 F. At this point, the carbon dioxide flow is increased to 800 to 900 ml per minute. The solution temperature is maintained at 320 to 335 F with this carbon dioxide flow rate for at least 20 minutes and until the trichloroethylene vapors have been completely removed from the distillation flask. The above extraction-recovery method shall be repeated as necessary to obtain the desired quantity of asphalt. The asphalt recovered shall be used to determine penetration, 275 F viscosity, and 275 F viscosity ratio.
- E. The 275 F viscosity ratio shall be determined by comparing the 275 F viscosity on the base asphalt before and after the Thin-Film Oven Test. The Thin-Film Oven Test shall be performed as in ASTM D 1754. The specific gravity shall be determined by pycnometer as in ASTM D 70 for use in the Thin-Film Oven Test. The 275 F viscosity ratio shall be calculated by dividing the viscosity after the Thin-Film Oven Test by the original 275 F viscosity.
- F. The filler material shall be separated from the asphalt to determine Filler Content and Filler Fineness. The portion by weight of the adhesive insoluble in 1,1,1-trichloroethane shall be considered the filler content. Filler Content shall be determined by weighing  $10.00 \pm 0.01$  grams of solid adhesive into a centrifuge flask with approximately 100-ml volume such as that specified in ASTM D 1796. Add 50 ml of 1,1,1-trichloroethane to the adhesive, which should be broken up into small pieces in order to speed the dissolution process. Swirl or stir with a fine rod, taking care not to lose any solids. Place the sample flask in a balanced centrifuge and spin using a minimum relative centrifugal force to 150 (as determined in Section 6 of ASTM D 1796) for 10 minutes. Remove the sample flask and decant the solvent, taking care not to lose any solids. Repeat the application of solvent and centrifuging until the solvent becomes clear and the filler is visually free of asphalt. Dry the filler at  $160 \pm 5$  F to remove solvent and weigh the resulting filler. Filtration of the

decanted solvent may be performed to verify there is no loss of filler. Percent filler content is calculated as follows:

$$\text{Filler Content, \% by wt} = \frac{(\text{Filler wt, gm}) (100)}{\text{Original Adhesive wt, gm}}$$

- G. Filler Fineness shall be determined according to ASTM C 430 using Numbers 325, 200, and 100 sieves. This method is to be modified by the use of a water-soluble non-ionic wetting agent, such as Triton X-100, to aid the wetting action. Concentration of the surfactant solution shall be approximately one percent by weight. The one-gram dry sample shall be thoroughly wetted in the surfactant solution and allowed to soak for 30 minutes. The filler shall be transferred completely into the sieve cup and water-spray applied to two minutes. Surfactant solution may be added as needed and physical means used to disperse any clumped particles. The sample shall then be dried and handled as directed in ASTM C 430.

#### 4. PACKAGING AND LABELING

The adhesive shall be packaged in self-releasing cardboard containers with essentially flat and parallel top and bottom surfaces such that the packages will stack properly. Each package shall have a net weight of either 50 or 60 pounds and shall weigh within two pounds of the stated quantity. Self-releasing cardboard dividers which will separate each package into sections weighing no more than 15 pounds each shall be part of the packaging. Each package shall show the manufacturer's name, net weight, and lot or batch number and shall be imprinted with "Bituminous Adhesive for Pavement Markers" or similar wording identifying the contents.

SECTION 026201  
WATER LINE RISER ASSEMBLIES (S-79)

1. DESCRIPTION

This specification shall govern all work and materials required for proper installation of riser assemblies for water line testing.

2. MATERIALS

Riser Assemblies for 2" water line shall consist of (in order):

- 2" Straight Coupling Compression Fitting for copper tube with male iron pipe thread and setscrew; Ford C84-77 or approved equal
- 2" x 6" Galvanized Nipple
- 2" Galvanized 90° Bend
- 2" x 3' Galvanized Nipple
- 2" Straight Coupling
- 2" x 3' Galvanized Nipple
- 2" Brass Gate Valve

Riser assemblies for 4" and up water line shall consist of (in order):

- M. J. Plug or Cap, drilled and tapped (2")
- 2" x 6" Galvanized Nipple
- 2" Galvanized 90° Bend
- 2" x 3' Galvanized Nipple
- 2" Straight Coupling
- 2" x 3' Galvanized Nipple
- 2" Brass Gate Valve

3. CONSTRUCTION METHODS

The Contractor shall install riser assemblies on each end of water lines to be tested. Note that this includes all 2" service connections. The assembly shall be wrapped in polyethylene, and concrete thrust blocking shall be applied at the base.

After the line is tested and ready for connection to the existing water system, the Contractor shall remove the riser assembly. The riser assemblies shall remain the property of the Contractor.

4. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, Riser assemblies shall not be measured for payment. Payment for materials and labor shall be considered subsidiary to the payment for the water line pipe.

SECTION 026202  
HYDROSTATIC TESTING OF PRESSURE SYSTEM (S-89)

1. DESCRIPTION

This specification shall govern all work necessary for hydrostatic testing the completed pressure system. The Contractor shall provide all equipment, materials, labor, etc., as necessary, except as noted, and accomplish all testing under this specification.

2. MATERIALS

Water for filling the line and making tests shall be furnished by the Contractor through a standard meter connection. A meter and gauges for testing shall be supplied by the Contractor. A test pump with appropriate connector points as approved by the Water Superintendent for the installation of meter and gauge shall be furnished by the Contractor. The meter shall be directly connected to the main or pipe being tested by the use of copper tubing or an approved reinforced hose. The meter shall be protected against extreme pressures by the use of a one inch (1") safety relief valve set at the test pressure plus ten pounds per square inch and furnished by the Contractor.

3. TEST PROCEDURE

Tests shall be made only after completion of backfill as specified, and not until at least thirty-six (36) hours after the last concrete thrust block has been cast.

Each section of pipeline shall be slowly filled with water and the specified test pressure, measured at the point of lowest elevation, shall be applied. During the filling of the pipe, and before applying the specified test pressure, all air shall be expelled from the pipeline.

During the test, all exposed pipe, fittings, valves, hydrants, and joints shall be carefully examined. If found to be leaking, they shall be corrected immediately by the Contractor. If the leaking is due to cracked or defective material, the defective material shall be removed and replaced by the Contractor with sound material.

All pipes shall be subjected to two hydrostatic tests. The first hydrostatic test shall be a two-hour test at a pressure of 150 P.S.I. The second test shall be no less than 48 hours after successful completion of the first hydrostatic test. The second hydrostatic test shall be for a 24-hour period at City operating pressure for waterlines or at 50 P.S.I. for sanitary sewer force mains.

The maximum allowable leakage shall be as follows:

Ductile Iron Pipe, AWWA C600

$$L = \frac{SD\sqrt{P}}{133,200} \text{ or } L = \frac{N D\sqrt{P}}{7,400}$$

Asbestos - Cement Pipe, AWWA C603

$$L = \frac{N D\sqrt{P}}{4,000}$$

PVC Pipe - Uni-bell equation 99

$$L = \frac{N D\sqrt{P}}{7,400}$$

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WHERE

L = Maximum Allowable Leakage (Gal./Hr.)  
S = Length of Pipe Tested (Feet)  
N = Number of Joints in Tested Line (Pipe & Fittings)  
D = Nominal Diameter of Pipe (In.)  
P = Average Test Pressure (P.S.I.)

If the pressure system fails to meet the leakage requirements, the Contractor shall make the required repairs to the system and the system shall be retested. This procedure shall be repeated until the system complies with leakage requirements. The cost of each retest shall be \$100.

4. MEASUREMENT & PAYMENT

Unless indicated otherwise in the Proposal, Hydrostatic Testing of Pressure System will not be measured for pay, but shall be subsidiary.

SECTION 026204  
POLYVINYL CHLORIDE PIPE (S-91)  
(ASTM D 2241 Pressure Pipe for Sanitary Sewer Force Mains, and Irrigation  
Systems and water Transmission Lines)

1. DESCRIPTION

This specification shall govern all work necessary for furnishing all PVC pipe (ASTM D 2241) required to complete the project.

2. MATERIALS

PVC pipe shall be made of Class 12454-A or Class 12454-B virgin compounds as defined in ASTM D 1784 with an established hydrostatic-design-base of 4000 psi for water at 73.4° F.

3. DIMENSIONS

Pipe shall be manufactured to standard steel pipe O.D. (IPS), with dimensions and tolerances in accordance with ASTM D 2241.

4. JOINTS

Pipe shall have a gasket bell end with a thickened wall section integral with the pipe barrel in accordance with ASTM D 3139. The use of solvent weld pipe shall not allowed.

5. GASKETS

Gaskets for jointing pipe shall be in accordance with ASTM F477. (For High Head)

6. PIPE PRESSURE RATING AND STANDARD DIMENSION RATIO

The pressure rating and SDR for PVC pipe (ASTM D 2241) shall be as indicated on the drawings. Pressure rating shall be based on the ISO equation in section 4.5 of ASTM D 2241 with a maximum allowable hydrostatic design stress of 2000 psi (Safety Factor of 2.0).

7. CAUSE FOR REJECTION

Pipe shall be clearly marked in accordance with section 9 of ASTM D 2241. Unmarked or scratched pipe shall be rejected.

8. CERTIFICATION

The contractor shall furnish in duplicate to the Engineer a copy of the manufacturer's affidavit of compliance with this specification. Certification shall accompany each delivery of materials, to include gaskets.

9. MEASUREMEN & PAYMENT

Unless specified otherwise in the Special Provisions, PVC pipe (ASTM D 2241) shall not be measured for pay, but shall be subsidiary to the appropriate bid item.

SECTION 026206  
DUCTILE IRON PIPE AND FITTINGS (S-81)

1. DESCRIPTION

This specification shall govern all work necessary for furnishing all ductile iron pipe and fittings required to complete the project.

2. GENERAL

All ductile iron pipe shall conform to AWWA C151. The interior of pipe and fittings shall be lined with enameled cement mortar in accordance with AWWA C104. The exterior of pipe and fittings shall have a coating of coal tar enamel of approximately 1 mil thick or as specified in A.W.W.A. C-105. Buried Ductile iron pipe shall be wrapped in two plys of 8 mil polyethylene in accordance with Standard Specifications Section 026602 or Section 026402.

3. FITTINGS

All fittings shall be either gray cast iron or ductile iron and in accordance with AWWA C110 or C153. Fittings shall have a pressure rating of 250 p.s.i for sizes through 12" and 150 p.s.i for 14" and larger sizes, unless shown differently on drawings. Unless noted otherwise on drawings, Mechanical Joints shall be used.

4. JOINTS

Joints for pipe shall be mechanical type; joints for fittings shall be mechanical joints, unless shown otherwise on drawings.

Mechanical joints shall conform to AWWA C111 and/or C153. Mechanical joints shall be furnished complete with joint material, Cor-ten nuts, Cor-ten bolts, glands and gaskets.

When restrained joints are indicated on the drawings, restrained joints for pipe and fittings of 12" diameter and less shall be mechanical joint with retainer gland Series 1100 by EBA Iron or approved equal with a minimum of 250 psi rated working pressure. Restrained joints for pipe and fittings over 12" in diameter shall be push on type with a retainer ring as LOK-RING by American Ductile Iron Pipe or TR FLEX by U.S. Pipe, or approved equal.

Gaskets shall be of synthetic rubber. An analysis of the material used in each size gasket showing the type of synthetic rubber and that no natural rubber is present shall be supplied



## 5. PIPE

Pressure class ductile iron pipe requirements:

<u>Diameter</u> (inches)	<u>Pressure Class</u> (psi)	<u>Wall Thickness</u> (inches)	<u>Range of Maximum Allowable Depth Cover</u> (feet) (feet)	
			A - B*	
4#	350	0.25	60+	
6	350	0.25	30 - 65	
8	350	0.25	20 - 50	
10#	350	0.26	15 - 45	
12	350	0.28	15 - 44	
14#	300	0.30	13 - 42	
16	300	0.32	13 - 39	
18	300	0.34	13 - 36	
20	300	0.36	13 - 35	
24	250	0.37	11 - 29	
24+	x	x	x	

\* Range of maximum allowable depth of pipe where:

A = Ground water, or unstable bottom, or quick condition.

B = Ideal trench conditions, and sand encasement is at an average density in excess of 90% Standard Proctor.

# Pipe sizes not typically specified on City projects, but shown for reference.

x Requires special evaluation.

The face of bells shall be plainly marked by color coding for classes so as to be readily identified in the field.

## 6. CERTIFICATIONS

A certification shall accompany each order of pipe and fittings furnished to job site. Certification shall include the following items: indicate that pipe complies with Part 3 of this specification; indicate that fittings and joints comply with Part 4 of this specification (it should be noted that the supplier shall furnish sufficient technical material for the Engineer to determine whether or not push-on joints can comply with the "or equal" clause); and a copy of a lab analysis of the material used in each size gasket showing the type of synthetic rubber and that no natural rubber is present.

## 7. MEASUREMENT & PAYMENT

Unless specified otherwise in the Special Provision, Ductile Iron Pipe shall not be measured for pay but shall be subsidiary to the appropriate bid item.

SECTION 026210  
POLYVINYL CHLORIDE PIPE (S-83)  
(AWWA C900 & C905 Pressure Pipe for Municipal water Mains and  
Sanitary Sewer Force Mains)

1. DESCRIPTION

This specification shall govern all work necessary for furnishing all PVC pipe (AWWA C900 and C905) required to complete the project.

2. MATERIAL

PVC pipe shall be made of Class 12454-A or Class 1245-B virgin compounds, as defined in ASTM D1784 with an established hydrostatic-design-basis of 4000 psi for water at 73.4° F.

3. DIMENSIONS

Pipe shall be manufactured to cast iron pipe equivalent outside diameters.

4. JOINT

Pipe shall have a gasket bell end with a thickened wall section integral with the pipe barrel. The use of solvent weld pipe shall not be allowed.

5. GASKETS

Gaskets for jointing pipe shall be in accordance with ASTM F477. (High Head)

6. PIPE PRESSURE CLASS AND DIMENSION RATION

Unless indicated otherwise on the drawings pipe shall have a dimension ratio (DR) of 18 and in accordance with:

<u>Pipe Size</u>	<u>Designation</u>
4" to 12"	AWWA C900
Over 12"	AWWA C905

7. CAUSE FOR REJECTION

Pipe shall be clearly marked in accordance with AWWA Requirements. Unmarked or scratched pipe shall be rejected.

8. CERTIFICATION

The contractor shall furnish in duplicate to the Engineer a copy of the manufacturer's affidavit of compliance with this specification, to include gaskets. Certification shall accompany each delivery of materials.

9. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, PVC pipe (AWWA C900 or C905) will not be measured for pay but shall be subsidiary to the appropriate item of work for waterline or sanitary force main, etc.

SECTION 026212  
MOLECULARLY ORIENTED  
POLYVINYL CHLORIDE PIPE (MOP)  
(AWWA C909 Pressure Pipe for Municipal Water Mains and  
Sanitary Sewer Force Mains)

1. DESCRIPTION

This specification shall govern all work necessary for furnishing all MOP pipe (AWWA C909) required to complete the project.

2. MATERIAL

MOP pipe shall be made of Class 12454-A or Class 1245-B virgin compounds, as defined in ASTM D1784 with an established hydrostatic-design-basis of 7100 psi for water at 73.4° F.

3. DIMENSIONS

Pipe shall be manufactured to cast iron pipe equivalent outside diameters.

4. JOINT

Pipe shall have a gasket bell end with a thickened wall section integral with the pipe barrel. The use of solvent weld pipe shall not be allowed.

5. GASKETS

Gaskets for jointing pipe shall be in accordance with ASTM F477. (High Head)

6. PIPE PRESSURE CLASS

Unless indicated otherwise on the drawings pipe shall be Class 150.

7. CAUSE FOR REJECTION

Pipe shall be clearly marked in accordance with AWWA Requirements. Unmarked or scratched pipe shall be rejected.

8. CERTIFICATION

The contractor shall furnish in duplicate to the Engineer a copy of the manufacturer's affidavit of compliance with this specification, to include gaskets. Certification shall accompany each delivery of materials.

9. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, MOP pipe (AWWA C909) shall not be measured for pay but shall be subsidiary to the appropriate bid item, waterline, sanitary force main, etc.

SECTION 026214  
GROUTING ABANDONED UTILITY LINES (S-3)

1. DESCRIPTION

This specification shall govern all work and materials required for grouting abandoned utility lines.

2. MATERIALS

Raw Soil: Soil shall be typical clayey soil of the area. It shall be from the project site or other approved source not suspected of being contaminated. The soil shall have a Plasticity Index over 15 and a Liquid Limit not to exceed 65.

Lime: Lime shall be hydrated lime, calcium hydroxide, in accordance with AASHTO M 216.

Water: Water shall be potable.

3. CONSTRUCTION METHODS

Mix Design: The following is given as a typical mix design for trial mix. The mix design is based on damp soil with initial water content of about 15%. The proportions of soil and lime shall not be altered. The Contractor shall determine the amount of water to be added as required to produce a mix at its liquid limit.

Trial Mix Design:

Damp Soil	1000 lb.
Lime	50 lb.
Water (approximate)	48 gal.

Consistency shall be checked with liquid limit apparatus.

Placement: The Contractor shall grout abandoned lines as indicated on the drawings. Temporary pumping and venting ports shall be placed as required to provide complete filling of the abandoned line and proper placement of the grout. If segregation or "sand packing" is experienced during pumping, the Contractor shall reduce water content of mix or obtain other soil source, as required. Any damage resulting from pumping operation shall be repaired at the Contractor's expense.

4. MEASUREMENT & PAYMENT

Unless indicated otherwise in the Proposal, Grouting Abandoned Utility Lines shall be measured by the linear foot. Payment shall include all equipment, materials and incidentals required to mix, transport, and place the grout and restore surface at pump ports.

SECTION 026402  
WATERLINES (S-88)

1. DESCRIPTION

This specification, in conjunction with the City of Corpus Christi's Water Distribution System Standards, shall govern all work necessary for the installation of all waterline facilities required to complete the project.

2. MATERIALS

**Concrete:** Concrete shall have a minimum compressive strength of 2000 PSI.

**Bedding Sand for Encasement:** Sand shall be granular soil of low plasticity such that 100% pass a #4 sieve and no more than 10% pass a #200 sieve and the PI shall not exceed 10. Soils with a Unified Classification of SW and SP, or AASHTO Classification of A3, and some A2 soils shall be required.

**Ductile Iron Pipe and Fittings:** See Standard Specification Section 026206.

**Cast Iron Pipe and Fittings:** See Standard Specification Section 26208.

**Polyvinyl Chloride Pipe:** See Standard Specification Section 026210.

**Molecularly Oriented Polyvinyl Chloride Pipe:** See Standard Specification Section 026212.

**Tapping Sleeves and Valves:** See Standard Specification Section 026409.

**Gate Valves for Waterlines:** See Standard Specification Section 026411.

**Fire Hydrants:** See Standard Specification Section 026416.

3. CONSTRUCTION METHODS

(1) **HANDLING MATERIALS**

- a) General: The Contractor shall be responsible for the safe storage of all material furnished to, or by him, and accepted by him, until it has been incorporated in the completed project.

All material found during the progress of the work to have cracks, flaws or other defects will be rejected, and the Contractor shall remove such defective material from the site of the work.

- b) Unloading and Distribution of Materials at Work Site: Pipe and other materials shall be unloaded at point of delivery, hauled to and distributed at the job site by the Contractor. Materials shall at all times be handled with care and in accordance with manufacturer's recommendations. Care shall be taken not to scratch PVC pipe. Excessive scratching shall be considered cause for rejection of PVC pipe. Materials may be unloaded opposite or near the place where it is to be installed provided that it is to be incorporated into the work within 10 days. The Contractor shall not distribute material in such a manner as to cause undue inconvenience to the public.
- c) Storing Materials: Materials that are not to be incorporated into the work within 10 days shall be stored on platforms. The interior of pipes and accessories shall be kept free from dirt and foreign matter.

(2) **ALIGNMENT AND GRADE**

- a) General: All pipes shall be laid and maintained to the required lines and grades. Fittings, valves and hydrants shall be at the required locations with joints centered, spigots home and all valve and hydrant stems plumb.

Temporary support and adequate protection of all underground and surface utility structures encountered in the progress of the work shall be furnished by the Contractor.

Where the grade or alignment of the pipe is obstructed by existing utility structures such as conduits, ducts, pipes, connections to sewers or drains, the obstruction shall be permanently supported, relocated, removed, or reconstructed by the Contractor at the Contractor's expense, in cooperation with the owners of such utility structures.

- b) Deviation from Drawings: No deviation from the line and grade shown on plans may be made without the written consent of the Engineer.
- c) Depth of Cover: Depth of cover will be measured from the established street grade or the surface of the permanent improvement, or from finished grade to the top of the pipe barrel. Unless otherwise shown on drawings, the minimum depth of cover shall be 36 inches.

(3) **TRENCH EXCAVATION AND BACKFILL**

See Standard Specification Section 022020, Excavation and Backfill for Utilities and Sewers.

(4) **POLYETHYLENE WRAPPING**

All ductile or cast iron pipe, valves and fittings, except pipe or valves which are laid in encasement pipe or in concrete valve boxes, shall be wrapped in polyethylene. The polyethylene material shall have a thickness of 8 mils and may be either clear or black. The wrapping shall be lapped in such manner that all surfaces of pipe valves and fittings, including joints, shall have a double thickness of polyethylene. If a single longitudinal lap is made, using a double thickness of polyethylene, it shall be lapped a minimum of 18 inches and the lap shall be placed in the lower quadrant of the pipe and in such a manner that backfill material cannot fall into the lap. The polyethylene shall be secured in place with binder twine at not more than 6-foot intervals. If wrapping is applied before the pipe is placed in the trench, then special care shall be taken in handling the pipe so that the wrapping will not be damaged. Care shall also be exercised in backfilling around the pipe and fittings and in blocking fittings so as not to damage the wrapping. Any wrapping that may be damaged shall be repaired in a manner satisfactory to the Engineer and so as to form the best protection to the pipes.

(5) **SAND ENCASEMENT**

All pipe and fittings that are not enclosed in concrete valve boxes, or laid in encasement pipe, shall be completely encased with a minimum of eight inches of sand. This encasement includes the bottom, sides and top of pipe and fittings including bells, so that all portions will be encased with a minimum of eight inches of sand to insulate the pipe from the natural ground and from the backfill. The sand shall be compacted to a minimum of 90% Standard Proctor.

Sand shall be placed in a manner that will not injure the polyethylene wrapping and shall be compacted under, around the side, and over the pipe

in a manner that will reduce settlement to a minimum and as approved by the Engineer.

In order to reduce the amount of sand required, the trench bottom may be excavated in a rounded manner so as to maintain at least a minimum of eight inches of sand between the excavation and the pipe.

(6) **LOWERING PIPE AND ACCESSORIES IN THE TRENCH**

- a) General: The trench shall be excavated true and parallel to the pipe center line with a minimum clearance of eight inches below the pipe bottom and with a like clearance from the bottom of the bell to the bottom of the bell hole. The trench will then be refilled to the proper grade with sand as specified. The placing of the encasing material shall be done in such a manner so as to be free of all natural soil rock or other foreign matter.

After final grading in the trench of the encasing material, bell holes shall be excavated at each joint.

Proper implements, tools and facilities satisfactory to the Engineer shall be provided and used by the Contractor for the safe and efficient execution of the work. All pipe, fittings, valves, hydrants and accessories shall be carefully lowered into the trench by means of a derrick, ropes, or other suitable equipment, in such a manner as to prevent damage to pipe and fittings. Under no circumstances shall pipe or accessories be dropped or dumped into the trench.

- b) Inspection of Pipe and Accessories: The pipe and accessories shall be inspected for defects prior to lowering in the trench. Any defective damage or unsound pipe shall be replaced.
- c) Clean Pipe: All foreign matter, or dirt, shall be removed from the interior of the pipe prior to lowering into the trench. Pipe shall be kept clean both in and out of the trench at all times during the laying.

(7) **JOINTING PIPES**

All pipes shall be made up in accordance with manufacturer's recommendation. Pipe deflection shall not exceed 75% of the maximum amount recommended by the manufacturer.

(8) **CONCRETE THRUST BLOCKS**

Thrust backings shall be applied at all bends, tees, incomplete crosses and blow-offs, except at anchored fittings. The size and shape of the thrust blocking shall be as shown on the plans. Materials for the backings shall be minimum 2,000 psi concrete and shall be placed between solid ground and the fittings to be anchored. The sizes of thrust blocking is indicated on the drawings.

The backing shall be placed so that the pipe and fitting joints will be accessible for repair.

Temporary thrust blocks, or other means of carrying thrust loads generated by hydrostatic testing shall be provided at all ends of lines to be tested. Details of the end connections and method of temporary blocking shall be submitted to the Engineer for approval. After satisfactory completion of the hydrostatic test, this temporary blocking shall be removed so that connections may be made with existing lines. This work is subsidiary to waterline installation and no separate payment will be made for it.

(9) **METAL HARNESS**

Metal harness, tie rods and clamps, or swivel fittings shall be used to prevent movement when soil conditions would not withstand thrust blocking. Steel rods and clamps shall be galvanized, or otherwise rust proofed or coated with hot coal tar enamel, then wrapped with two layers of polyethylene wrapping.

(10) **STERILIZATION**

- a) Fittings: Valves, hydrants and fittings shall be stored on timbers and kept clean. Where soil or other substance has come in contact with the water surfaces of the fittings, the interior shall be washed and sterilized with 2% solution of calcium hypochlorite.
- b) Pipe: As each joint of pipe is laid, the Contractor, unless otherwise specified by the Engineer, shall throw powdered calcium hypochlorite (70%) through the length of the joint (One pound for each 1,680 gallons of water to give 50 ppm). When the line is complete, and before testing, same shall be slowly filled with water between valves and allowed to stand for 48 hours. After sterilization period is completed, lines shall be flushed by the Contractor under the direct supervision of a representative of the City Water Department. The Engineer will take same test two hours after refilling. If the sample does not pass State Health Department purification standards, the procedure shall be repeated. The entire procedure shall be coordinated under the supervision of the Water Division Superintendent/Engineer.

During sterilization process, valves shall be operated only under the supervision of the Water Division Superintendent/Engineer. There shall be a base fee of \$100 paid by the Contractor to the City for each retest that is required.

(11) **HYDROSTATIC TESTING WATER SYSTEM**

See Standard Specification Section 026202, Hydrostatic Testing of Pressure System.

(12) **WATER SERVICE CONNECTIONS**

See Standard Specification Section 26404, Water Service Connections.

**4. MEASUREMENT AND PAYMENT**

Unless indicated otherwise in the Proposal, Waterlines will be measured by the linear foot for each size installed. Payment shall include, but not be limited to, trenching, dewatering, bedding, pipe (except for fittings), restraints, thrust blocking, backfill, all labor, materials, equipment, and incidentals required to complete the work.



SECTION 026404  
WATER SERVICE LINES (S-87)

1. DESCRIPTION

This specification shall govern all work necessary for furnishing and installing water service lines required to complete the project. Water Service lines are those lines from the City main to the meter at the property line

2. MATERIALS

GENERAL

Service fittings shall have a minimum of 150 psi working pressure rating, unless indicated otherwise.

Fittings and materials shall be in accordance with the applicable provisions of AWWA C-800.

All service connections shall require service clamps.

SERVICE CLAMP

Service clamps shall be brass saddle with two silicone bronze straps with I.P. thread and have a minimum working pressure rating of 200 psi. The saddle and nuts shall be of 85-5-5-5 brass alloy per ASTM B-62 and AWWA C800. The Nuts shall have unitized washers. Straps shall be 5/8" high quality silicone bronze flattened and contoured to provide a wider bearing surface against pipe. Clamps shall be comparable to:

Ford 202B, Smith Blair 323, Rockwell 323

CORPORATION STOP

Corporation Stop shall be of brass with I.P. thread inlet and Muller 110 Compression connection outlet designed for type K copper pipe and be comparable in design to the following:

Muller H-15028 for 1" sizes  
Muller H-15023 for 1½" & 2" sizes

ANGLE METER STOP

Angle Meter Stop shall have a Teflon coated bronze ball which rotates within two Buna-N rubber seats. Inlet shall be packed joint for Type K copper and be comparable in design to the following:

Ford BA43-342 for 1" Service Line with 5/8"x3/4" or 3/4" meter size  
Brass gate valve req. for 1½" and 2" sizes

SERVICE LINE

Service line shall be of type K copper tube.

Other products of comparable featured and equal quality may be substituted for the above items with approval of the Engineer.

### 3. CONSTRUCTION METHODS

See Section 022020.9, "Excavation and Backfill for Utilities and Sewers".

Service lines shall be placed by the Contractor as indicated on the drawings and as directed by the Engineer.

Relocation of existing meters and change overs to the new system shall be done only under the direct supervision of the City Water Department.

### 4. MEASUREMENT & PAYMENT

Unless indicated otherwise in the Proposal, Water Service Lines shall be measured with the units indicated in the proposal for each size of service line. Payment for service lines shall include but not be limited to the following: copper tubing, corporation stop, service clamp, angle meter stop, trenching, trench safety, testing, flushing, clean-up, site restoration, all labor, all equipment, and incidentals required for the proper installation.

SECTION 026406  
Private Water Service Lines (S-112)

1. Scope:

This section governs the furnishing of all labor, equipment, tools and materials necessary for the construction of private water service lines as shown on the plans, as outlined herein and as necessary to complete the project. Private water service lines are defined as those lines from the customer side of the water meter to the structure.

2. Materials:

Materials for the construction of private water service lines shall comply with the provisions of the Standard Plumbing Code as published by the Southern Building Code Congress and as adopted, with local amendments, by the City of Corpus Christi, unless otherwise noted herein or on the plans.

3. Permits:

Normal plumbing permit application and fee requirements of the Standard Plumbing Code as adopted by City Code shall apply for this project. A plumbing permit for each lot will be issued to the Contractor by the Building Inspections Department of the City of Corpus Christi. The Contractor shall make application for permits upon award of the contract.

4. General Obligations:

- (a) Contractor: The Contractor shall construct private water line services in accordance with the plans and these specifications in a neat and workmanlike manner. The route of the proposed water service shall be determined by the Contractor subject to approval of the Owner and the Engineer. All work on private service lines shall be supervised and inspected by a licensed plumber. Good relationships with the public are essential to the success of this project. The Contractor shall make all the required notifications and notices to the owner/occupants in the area. The work shall be accomplished with minimal inconvenience to the public and owner/occupants. The Contractor shall cooperate with all City employees involved in the execution of this contract. The removal of the existing meter from the old location and placement in the new location shall be done by the Contractor under City supervision. Contractor will be held responsible for restoring the water service level better than or equal to before. Compensation will be addressed on an as needed basis upon approval by the Engineer.
- (b) City: The Engineer will review work proposed by the Contractor and the City Plumbing Inspector shall inspect the installation.

5. Sequence of Work and Construction Methods:

- (a) City will mail out general letter to property owner describing the project with Form WS-1 (See Appendix) for execution.
- (b) Contractor shall acquire authorization for site inspections, using Form WS-1 in Appendix from those owners not responding to general letter.
- (c) Contractor shall perform site inspection, fill-out required forms

and submit copy of [Private Water Service Inspection Report & Routing Recommendation] and Site Plan Showing Route to Engineer. (see From W-2 and Sample Site Plan in Appendix). Contractor is encouraged to take photographs of before and after conditions on each lot.

- (d) Typically, the proposed service line will be connected at the existing riser serving the main structure, usually at the rear. In special cases, where existing surface improvements preclude trench excavation, the connection of the proposed line to the existing line may be allowed at an alternate location. Any alternate tie in locations must be authorized by the Engineer; and there must be evidence that equivalent water pressure of the standard connection will result using the information gathered during the site inspection.
- (e) Contractor notifies owner/occupant of proposed construction and acquires approval for proposed construction with City assistance using Form W-2.
- (f) Construct private service lines from structure to proposed meters.
  - (1) Materials shall be installed in accordance with manufacturer's requirements and as set forth in the plumbing code.
  - (2) The Contractor shall be responsible for laying the line along the pre-approved Site Plan Route. All lines shall be a minimum depth of 18 inches except at the riser and near water meter. Portions of the lines that are exposed shall be protected from frost action.
  - (3) Separate trenches (one for water and one for sewer) separated by undisturbed or compacted earth shall be excavated. The trenches shall be excavated in such a manner which will minimize damage to surface vegetation. After installation of the line, the excavated material shall be tamped into the trench and the surface restored to a condition acceptable to the Engineer. Lines shall be bored, jetted or jacked under sidewalks, driveways or other such improved surfaces--unless authorized by the Engineer.
  - (4) When authorized, the proposed line may be hung under pier and beam structures. In such cases, new line shall be insulated and supported with hangar straps at intervals not to exceed four (4) feet spacing.
  - (5) Where required by the building code, electrical ground wires shall be installed to assure any appliances grounded to the plumbing system remain grounded.
  - (6) Boring and casing shall be required adjacent to foundations (Foundation Protection Exhibit in Appendix).
- (g) Clean, flush, and pressure test new service lines. Make final connection to riser. The service line shall remain under pressure to the angle water check valve.
- (h) Construct the water service lines to the angle meter stop for meter setting. Clean, flush, and put into service.

- (1) The proposed meter location shall be placed as follows:
  - (a) for separated curb and sidewalk; 1.5 feet from curb edge of sidewalk;
  - (b) for sidewalk tied to curb; 1.5 feet behind sidewalk;
  - (c) where no sidewalk exists; 4.5 feet behind the curb;
- (2) The City shall furnish the Contractor a water meter housing so that a proper alignment of the angle meter stop and meter coupling is assured.
  - (i) Set meter box. Existing meter boxes shall be re-used on this project. Any meter boxes which are cracked, broken, or have missing lids shall be replaced with new meter boxes provided by Water Department as deemed necessary by the City Water Inspector.
  - (j) The Contractor shall remove the old meter and set the same meter at the new location. Concurrently, the Contractor shall plug the existing service line and backfill the old meter box pit with clean excavated material.

#### 6. Interruptions of Water Service:

The Contractor shall advise the building occupants a minimum of twenty-four (24) hours in advance of the interruption of water service. After the water service has been interrupted, the Contractor shall expeditiously continue work until service has been restored. In no case shall water service be interrupted for more than four (4) hours.

#### 7. Measurement and Payment:

Private water service lines shall be measured per each service for the appropriate size of meter setting installed. Payment be full compensation for furnishing and installing all lines, valves, fittings, hangar straps, meter boxes and incidentals, trenching, trench safety, boring, jetting or jacking, flushing, testing, service restoration and all other work or materials required to provide water service lines from the meter location to the existing riser.

SECTION 026409  
TAPPING SLEEVES AND TAPPING VALVES (S-84)

1. DESCRIPTION

This specification shall govern all work and materials required for furnishing and installing of tapping sleeves, sleeves and valves. Required to complete the project.

2. MATERIALS

Tapping sleeves shall have a Class 125 ANSI B 16.1 outlet flange of cast iron, ductile iron, or stainless steel. Sleeves shall be of ductile iron, gray cast iron, or 304 or 316 stainless steel. Lugs, bolts, washers, and nuts shall be of 304 or 316 stainless steel. Iron sleeves shall be of the mechanical joint or caulked joint type as manufactured by Mueller, Clow, or approved equal. Stainless steel sleeves shall be of the compression gasket type capable providing full support of the tapped pipe as manufactured by Ford, Smith Blair, Romac, or approved equal. Gasket materials shall be of material suitable for potable water systems.

Tapping sleeves shall be sized for the type and size of pipe to be tapped. The class of asbestos cement pipe that will most likely be encountered in the water will be class 200 for pipes 6" in diameter and less, and class 150 for larger pipes. It should be understood that existing pipes to be tapped might not be of the type of material and/or size that is shown on the drawings. The proper size and type of tapping sleeve shall be provided and installed regardless of what is encountered.

Tapping Valves shall conform to AWWA Standards and City Standard Specification Section 026411.

Valve boxes shall be as described in Section 026411.2, "Gate Valves for Water Lines".

3. CONSTRUCTION METHODS

Construction methods shall adhere to those set out in Section 026402 "Waterlines", and Section 022020 "Excavation and Backfill for Utilities and Sewers".

4. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, Tapping sleeves and Tapping sleeves shall be made on a per each basis and shall include payment for all labor, material, and equipment for installation of the fittings and all other related items such as bolting, wrapping, sand encasing, valves complete in place including joint materials and cast iron valve box, box extension, cover, concrete collar, all as required to install the valves as indicated and specified.

SECTION 026411  
GATE VALVES FOR WATER LINES (S-85)

1. DESCRIPTION

This specification shall govern all work necessary to provide all gate valves and valve boxes required to complete the project.

2. MATERIALS

Gate Valves

All valves shall meet the following requirements. Gate valves shall conform to AWWA Standard C500 or AWWA Standard C-509 except for changes or additions as follows: (Note: Valves manufactured by the Mueller Co., Eddy-Iowa Division of James B. Clow & Son., Darling Valve & Manufacturing Co., and the Rensselaer Valve Company are acceptable provided they comply with these specifications.)

- 1) The gate valves shall be double disc with parallel or tapered seats (C500) or resilient wedge (C-509) and non-rising stems.
- 2) Valve ends shall be flanged or mechanical joint type or a combination of these as indicated or specified. A complete set of joint materials shall be furnished with each valve, except for bell ends and flanges.
- 3) Valves 16" and larger shall be furnished for horizontal installation.
- 4) Stem seals shall be the O-ring type on valves through 12". Valves 16" and larger may be equipped with stuffing boxes.
- 5) Valves shall open left (counter clockwise). Valves over 18" shall have the main valve stem furnished with a combination hand wheel and operating nut.
- 6) Tapping valves to be used with tapping saddles shall have one end mechanical joint.
- 7) The minimum number of turns to open as applied to the operating nut for valves through 12" shall be as set out in Table 3 (AWWA C500) and for valves 16" and larger as follows:

16 inch	-	96 turns to open
20 inch	-	128 turns to open
24 inch	-	152 turns to open
30 inch	-	186 turns to open
36 inch	-	222 turns to open
- 8) All valves shall be equipped with bronze hooks or wedge pins. All valves 16 inches in diameter and above shall be equipped with bevel gears, bronze rollers, bronze tracks, bronze scrapers and bronze hooks or wedge pins.
- 9) All gears shall be in oil filled extended type gear cases.
- 10) No position indicator will be required.
- 11) Bypass valves shall be installed on valves 20" in diameter and larger.
- 12) Within 30 days after award of contract, the Contractor shall submit in triplicate, for approval, the following:

- a) Certified drawings of each size and type of valve 16" and larger showing principal dimensions, construction details, and materials used.
- b) On all size valves, the composition of bronze to be offered for various parts of the valve, complete with minimum tensile strength in p.s.i., the minimum yield strength in p.s.i., and the minimum elongation in 2" per cent.

#### Cast Iron Valve Boxes

Cast iron valve boxes shall be provided over all operating nuts of gate valves 12" and smaller. The word "WATER" shall be cast in the top cover. The boots shall be hemispherical in shape and shall fit the particular valve size. The boxes and lids shall be given a coat of hot tar dip.

Valve boxes shall be hemispherical in shape and shall measure 10" inch at the bottom diameter. The valve box shall have 1" inch wide by 1" inch thick rim around the middle 4" inches from the top. It shall have a 6" inch inside diameter bell type top extension with a 7" inch by 7 1/8" inch tapered bell of 1" inch depth. The vertical distance from the bottom of the extension to the top of the bell shall be 11" inches. The casting shall be free of defects with all mold marks and defects ground off. The valve box shall have 1 coat of hot tar dip.

The extension pipe of the valve box described above shall be eight 8" plastic (SDR 35).

### 3. CONSTRUCTION METHODS

#### GATE VALVES

Gate valves shall be installed as indicated on the drawings.

#### Cast Iron Valve Boxes

Valve boxes shall be installed as indicated on the drawings. When valves are in the street R.O.W., the top of box shall be set flush with the pavement or surrounding ground. In cultivated areas, the top of box shall be set 12" below natural ground and long enough to be raised to natural ground at a future date.

### 4. MEASUREMENT & PAYMENT

Unless indicated otherwise in the Proposal, Gate Valves for Waterlines shall be measured as a unit for each gate valve and valve box installed. Payment shall include the costs for furnishing and installing the valves complete in place including joint materials and cast iron valve box, box extension, cover, concrete collar, all as required to install the valves as required.



SECTION 026413  
BUTTERFLY VALVES FOR WATERLINES (S-85B)

1. DESCRIPTION

This specification shall govern all work necessary for furnishing and installing butterfly valves with boxes required to complete the project.

2. MATERIALS

BUTTERFLY VALVES

General:

All butterfly valves shall be tight-closing, rubber-seat type conforming to AWWA C504 and the following. Acceptable suppliers shall have a minimum of 5 years experience in the manufacturer of butterfly valves of the type specified herein. Unless indicated otherwise on the drawing, valves shall be Class 150B.

Body end connections:

Mechanical Joint ends conforming to AWWA C111 shall be required for all butterfly valves, unless indicated otherwise on the Drawing.

When flanged ends are indicated on the Drawings, valves shall have short body and flanged ends with flanges dimensioned in accordance with ANSI B16.1, class 125 cast-iron flanges.

Shaft: Shaft shall be type 304 or 316 stainless steel.

Disc: Valve disc shall be constructed of aluminum bronze ASTM A148-952 or ductile iron ASTM A536 with 316 stainless steel or monel disc edge, or ductile iron with removable seal.

Valve Seat: The seat shall be field replaceable, and body or ring mounted and shall be adjustable for seats over 30" in diameter. Adjustment shall not require special tools.

Bearings: Bearings shall be reinforced Teflon.

Actuator: Unless indicated otherwise on drawings. The valve actuator shall be integrally mounted on the valve-mounting flange. The housing, cover and shaft shall be sealed to prevent water entry under 25' submergence. Actuator shall be designed for buried service and furnished with 2" AWWA operating nut.

When Automatic Actuator is required - electric motor

Electric motor modulating valve actuator shall comply with AWWA C540 and the following:

- Rotation - 90 degree reversible
- Torque rating - for 125 p.s.i. differential
- Cycle time - less than 100 seconds
- Duty - 15 minutes continuous
- Manual operation - integral with declutching device
- Hand switch - integral 5 position to permit local operation
- Mechanical stops - internal to prevent over travel
- Gearing - for 30 to 60 second opening/closing
- Auxiliary limit switches - 4 SPDT: 2 full open, 2 full closed

Heater - 8 watt minimum  
Control wiring - 120 VAC, 1 phase, 60 Hz  
Equipment actuator with zero and span adjustments  
Provide actuator with a field set choice of valve position on loss  
of signal  
Submersible design required

Electrical Characteristics:

Power: 120 VAC. 1 phase, 60 Hz  
Rating: NEMA 4

Local Control:

Push button station equipped with:  
Remote/local switch  
Position indication lights  
Reversible, intermittent contact  
Close - stop - open switch  
Contact closure for remote/local indication where indicated in  
schedule  
Enclosure - NEMA 4  
Mounting - at inflow and outflow valves adjacent to tank

Manual Operation:

Type: Handwheel, lever, or (operating nut required below ground  
unless specified otherwise).

General:

Comply with AWWA C504  
Maximum torque at 80 lb. input  
Worm gear for handwheel operation  
Totally enclosed worm gear

Field Service: The equipment manufacturer shall furnish the services of a  
qualified factory field service engineer at the site to inspect the  
installation and instruct the City's Water personnel of the operation and  
maintenance of the unit.

O&M Manual: The manufacturer shall furnish the Engineer with 4 sets of  
complete operation and maintenance manuals (including wiring diagrams).

CAST IRON VALVE BOX

Valves boxes shall be provided and installed with all butterfly valves, unless  
indicated otherwise on the drawings. The word "Water" shall be cast in the top  
cover. The boots shall be hemispherical in shape and shall fit the particular  
valve size box, lid and boot shall be hot tar dipped. The extension pipe for  
the valve box assembly shall be 8" PVC with SDR of 35 or thicker. Valve box  
and accessories shall be designed for roadway application.

3. CERTIFICATIONS & TESTS

The valve manufacturer shall furnish an affidavit stating that valves comply  
with AWWA C504 and this specification with exceptions noted in affidavit. Said  
exceptions are subject to approval of the Engineer. The manufacturer shall  
furnish test records as per sections 2.3, 3.8.5.8, 3.8.5.9, 5.2.1, 5.2.2,  
5.2.3, and 5.2.4 of AWWA C504.

4. SHOP DRAWINGS

The manufacturer shall submit certified shop drawings as per sections 1.4 and 1.5 of AWWA C504.

5. CONSTRUCTION METHODS

Valves shall be installed in a workman like manor and wrapped with two plies of 8-mil polyethylene.

Valve boxes in street ROW shall be set flush with pavement or surrounding ground. In cultivated areas the top of box shall be set 12" below natural ground and long enough to be raised to natural ground at a future date.

6. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, Butterfly Valves with box shall be measured as a unit for each size of valve and box assembly. Payment shall include but not be limited to furnishing and installing the valve and box complete with polyethylene wrap, concrete collar, box assembly, and all labor, materials, incidentals, etc., required for the proper linstallation.

SECTION 026416  
FIRE HYDRANTS (S-86)

1. DESCRIPTION

This specification shall govern all work necessary to provide and install all fire hydrants required to complete this project.

2. MATERIALS

Concrete

Concrete shall have a minimum compressive strength of 2000 p.s.i. at 28 days.

FIRE HYDRANTS

The fire hydrants shall conform to AWWA C502-64 standard specifications for fire hydrants for ordinary water works service, except for changes, additions and supplementary details specifically outlined herein:

- a) Hydrants shall be of the traffic model type equipped with a safety flange or collar on both the hydrant barrel and stem.
- b) Type of Shutoff - The shutoff shall be of the compression type only.
- c) Inlet Connection - The inlet shall be ASA A-21.11 1964 mechanical joint for six (6") inch, Class 150 ductile iron pipe. A complete set of joint material shall be furnished with each hydrant.
- d) Delivery Classifications - Each hydrant shall have two hose nozzles and one pumper nozzle.
- e) Bury Length - The hydrants shall be furnished in the bury length as indicated on drawings.
- f) Diameter (Nominal Inside) of Hose and Pumper Nozzles - The hose nozzles shall be two and one-half (2½") inches inside diameter and the pumper nozzle shall be four (4") inches inside diameter.
- g) Hose and Pumper Nozzle Threads - The hose nozzles shall have two and one-half (2½") inch National Standard thread (7½" threads per inch). The pumper nozzle shall have size (6) threads per inch with an outside diameter of 4.658 inches, pitch diameter of 4.543 inches, and a root diameter of 4.406 inches.
- h) Harnessing Lugs - None required.
- i) Nozzle Cap Gaskets - Required.
- j) Drain Openings - Required.
- k) Tapping of Drain Opening - Tapping of the drain opening for pipe threads is not required.
- l) Nozzle Chain - Not required.
- m) Direction to Open - The hydrants shall open left (counter clockwise).

- n) Color of Finish Above Ground Line - That portion of the hydrant above the ground line shall be painted chrome yellow.
- o) Shape and Size of Operating and Cap Nuts - The operating and cap nuts shall be tapered pentagon one and one-fourth (1 $\frac{1}{4}$ " ) inch point to face at base and one and one-eighth (1- $\frac{1}{8}$ " ) inch point to face at top of nut.
- p) Nozzle Cap Chains - Hydrants shall be furnished without nozzle cap chains.
- q) Size of Fire Hydrant - The main valve opening shall not be less than five and one-quarter (5 $\frac{1}{4}$ " ) inches inside diameter.
- r) Valve Facing - The main valve facing of the hydrant shall be rubber with 90+ Durometer hardness. When the main valve lower washer and stem nut are not an integral casting then the bottom stem threads shall be protected with a bronze cap nut and a bronze lock nut.
- s) Barrel Sections - The hydrant shall be made in two or more barrel sections with flanges connecting the barrel to the elbow and to the packing plate.
- t) Breakable Coupling - Hydrants shall be equipped with a breakable coupling on both the barrel section and the stem. The couplings shall be so designed that in case of traffic collision the barrel and stem collar will break before any other part of the hydrant breaks.
- u) Hydrant Adjustment - The hydrant shall be designed as to permit its extension without excavating after the hydrant is completely installed.
- v) Breakable Collars, Barrel and Stem - Weakened steel or weakened cast iron bolts that are used in the breakable barrel couplings will not be acceptable.
- w) Operating Stem - Stems that have operating thread located in the waterway shall be made of manganese bronze, everdure, or other high quality non-corrodible metal. Stems that do not have operating threads located in the waterway must be sealed by a packing gland or "O" ring seal located between the stem threads and waterway. Iron or steel stems shall be constructed with a bronze sleeve extending through the packing or "O" ring seal area. The sleeve shall be of sufficient length to be in the packing gland "O" ring seal in both open and closed positions of the main valve. The sleeve shall be secured to the steel stem so as to prevent water leakage between the two when subjected to 300 pounds hydrostatic test pressure.
- x) Drain Valve Mechanism - Drain valves operating through springs or gravity are not acceptable.
- y) Operating Stem Nut - The operating stem nut shall be designed to prevent seepage or rain, sleet and the accumulation of dust between the operating nut and the hydrant top.
- z) Packing Gland or "O" Ring Seal - Fire hydrants having the threaded part of the stem at the hydrant top shall be equipped with a packing gland or an "O" ring seal immediately below the threaded section of the stem.

### 3. CONSTRUCTION METHODS

Fire hydrants shall be installed as shown on drawings. Minimum burial length shall be 3 feet. Breakable couplings shall be located at least 2 inches and less than 6 inches above finish grade.

Hydrants and fittings shall be stored on timber and kept clean. The interior surfaces of hydrants and fittings shall be washed and sterilized with approved sterilized agent, if requested by the Engineer at time of installation.

#### 4. CERTIFICATION

The manufacturer shall furnish to the Engineer two (2) certified sets of prints showing complete details and dimensions of the hydrant.

The manufacturer shall furnish to the Engineer one (1) certified copy of the physical tests of all metals used in the manufacture of the fire hydrant that is normally manufactured and that will meet these specifications.

#### 5. MEASUREMENT

Unless indicated otherwise in the proposal "Fire Hydrant Connection with ..." shall be measured as a unit. Will include but not be limited to the complete fire hydrant assembly with valve, 6" line, and fitting on the main.

Payment shall include all labor, materials and incidentals required to complete the work.

SECTION 026602  
SANITARY SEWER FORCE MAIN (S-69)

1. DESCRIPTION

This specification shall govern all work required for the installation of all sewage force mains required to complete the job.

2. GENERAL REQUIREMENTS

1. All work shall be done in a workmanlike manner, in accordance with drawings and specifications.
2. Prior to construction, the Contractor shall submit, for approval, certificates of inspection in duplicate to the Engineer from the pipe and fittings manufacturer(s) that said materials supplied has been inspected at the plant and meets the requirements of this specification.
3. It shall be the responsibility of the Contractor to keep on hand extra fittings and pipe, as he may deem necessary to make adjustments due to unknown obstructions, or to replace defective materials without delay to the project. When defective materials are discovered, they shall be immediately marked and removed from job site.
4. All pipe and fittings shall be clearly marked with trademark of manufacturer, batch number, location of plant, ASTM/ANSI/AWWA designation, size, pressure rating, class/SDR, and pressure rating.
5. Sewer marking tape shall be continuously applied along the top of the force main; except at joints. The tape shall be green and 2" wide and state "Sewer."

3. MATERIALS

- A. **Ductile Iron Pipe and Fittings:** See Standard Specification Section 026206.
- B. **PVC Pipe (AWWA C900 or C905):** See Standard Specification Section 026210.
- C. **MOP Pipe (AWWA C909):** See Standard Specification Section 026212.
- D. **PVC Pipe (ASTM D 2241):** See Standard Specification Section 026204.
- E. **Concrete:** Concrete shall have a minimum compressive strength of 2000 PSI.
- F. **Bedding Sand for Encasement:** Sand shall be granular soil of low plasticity such that 100% pass a #4 sieve and no more than 10 % pass a #200 sieve and the PI shall not exceed 10. Soils with a Unified Classification of SW and SP, or AASHTO Classification of A3 and some A2, soil shall be required.
- G. **Non-Standard Fittings:** Fittings having non-standard dimensions or fabricated specially for this project shall have a minimum pressure rating of 250 psi and durability comparable to that of the system. Drawings and specifications for non-standard fittings shall be submitted for approval of the Engineer prior to construction. Couplings and adapters for DIP and PVC connections shall be considered non-standard fittings.
- H. **Polyethylene Lining for Ductile Iron Pipe:** When indicated in the drawings or Special Provision, the interior of DI pipe and fittings shall be furnished with a factory applied polyethylene lining. Lining material shall be virgin polyethylene complying with ASTM D 1248, compounded with sufficient carbon black to resist ultraviolet degradation during above

ground storage. The polyethylene shall be fused to the interior of the pipe by heat, forming a securely bonded lining.

1. **Operating Limits:** The lining shall have the capability of withstanding operating temperatures from 0°F to 170°F and withstanding sewage with a minimum pH of 4.0.
2. **Application:** The interior surface of each pipe shall be blast-cleaned to remove high temperature oxide film and to form an anchor pattern over the entire surface prior to heating and lining. Polyethylene lining is to cover the inner surface of the pipe, extending from the plain or beveled end, to the rear of the gasket socket.
3. **Adhesion:** Pipe shall be checked at the point of manufacture to assure bond of the lining to the pipe. Any indication of separation of lining from pipe is cause for rejection. The acceptable method of testing is to use a knife to slit the lining to bare metal. This slit will be 1" to 2" in length and will be made approximately one foot from the plain end of the pipe. The knife point will then be used to attempt to pry the lining from the pipe. If the lining can be readily separated in this manner, the pipe shall be rejected. A minimum of two slit tests shall be performed per production shift. If either of the two tests result in rejection, only the remaining pipe from that production shift which independently passes the slit test may be accepted. After testing, the slit shall be repaired with a small torch lightly flaming the slit until the surface has fused.
4. **Entrapped Material:** Any sizeable protrusion in the lining, obviously caused by lining over foreign materials, shall be cause for rejection.
5. **Separations:** Linings which have separations caused by hot slips produced during the lining operation shall be rejected. A "Hot Slip" defect would appear as a double flow or fold in the lining with evidence of separation.
6. **Damages to Lining:** Injurious mechanical damage, such as chuck marks and gouges, extending to bare metal are not acceptable. The pipe having such a defect shall be rejected.
7. **Lining Thickness:** Linings of nominal 40 mil thickness shall generally equal or exceed 40 mil throughout the pipe. At pipe ends, lining thickness may taper for a distance of 4 inches from the ends, to a minimum of 20 mil thickness. However, the lining shall not deviate by more than 5 mil from the 40 mil nominal thickness as required through the pipe. The lining thickness of each pipe and fitting shall be taken at the point of manufacture using a general electric magnetic dry film thickness device, digital coating thickness gauge, Positector 2000, or approved equal, pipe and/or fittings with a lining thickness less than the minimum specified shall be rejected.
8. **Bell and Plain End Overcoat:** The bell socket and the last 2" of the plain end of each pipe shall be coated on the inside and outside with a factory applied mastic or epoxy coating. This coating shall be a minimum of 10 mil thickness and shall be Koppers 300M, Industrial Ruff Stuff, Roskote Mastic A-938, or equal.
9. **Pinholes and/or Holidays:** The inside surface of each pipe or fitting shall be free of pinholes, holiday discontinuities and any blister type surface imperfections. The manufacturer shall check each pipe or fitting for holidays at the point of manufacture with a



high voltage holiday detection device. Tinker & Rasor Model AP-W, or approved equal. Testing shall be conducted at the voltage as calculated in Section 3: Testing and Voltages of the "Recommended Practice for High Voltage Electrical Inspection of Pipeline Coatings Prior to Installation" as published by the National Association of Corrosion Engineers (NACE) Technical Practices Committee. All actual holiday testing procedures shall conform to NACE standard RP-02-74 and American Society for Testing Materials (ASTM) Designation: G62-Latest "Standard Test Methods for Holiday Detection in Pipeline Coatings." No holidays, misses or skips larger than a pinhole will be accepted for repair. A maximum of 6 holidays, as defined in ASTM Standard G62 and as determined by the detection test described above, on any one standard pipe length, fitting or special may be repaired by the heat refusion (torch flaming) or with epoxy.

10. **Independent Testing Laboratory Representation:** All testing as specified herein including the slit test, the lining thickness test, and the holiday test shall be witnessed by a representative from an approved independent testing laboratory. The independent laboratory shall be a member of the American Council of Independent Laboratories. Manufacturer must submit for approval by the City the name of the testing laboratory and actual qualifications of actual representative that will witness the testing. The manufacturer shall furnish three (3) copies of report by independent testing laboratory depicting results of all testing witnessed by the independent laboratory.
11. **Field Testing:** Each pipe and fitting are subject to inspection in the field by the City for conformance to these specifications prior to installation. Any defects as specified herein with any pipe or fittings shall be grounds for rejection.
12. **Sealing Cut Ends and Repairing Field Damaged Areas:** Remove burrs from field cut ends and smooth out edge of polyethylene lining. Remove all traces of oil or lubricant used during field cutting operation. All areas of loose lining associated with the cutting operation shall be removed and the exposed metal cleaned by sanding or scraping. For larger areas, roughen the bare pipe surface with a small chisel to provide an anchor pattern for the epoxy. The polyethylene lining shall be "stripped" back by chiseling, cutting or scraping about 1" to 2" into well adhered lined area before patching. After removal of loose lining and dirt, the area to be patched shall be "scratched" or "gouged" to offer an anchor pattern for the epoxy. Include an overlap of 1" to 2" of roughened polyethylene lining in the area to be epoxy coated. The roughening shall be done with a rough grade emery paper (40 grit), rasp, or small chisel. Avoid honing, buffing, or wire brushing since these tend to make surface to be repaired too smooth. With the area to be sealed or repaired absolutely clean and suitably "roughened," apply a thick coat of two part coal tar epoxy. The detailed mixing and application procedure for the epoxy shall follow the epoxy manufacturer's instructions. This heavy coat of epoxy shall be "worked" into the scratched surface by brushing. The Contractor shall maintain a supply of epoxy on the job site as required to seal cut ends and repair damaged pipe when encountered. Epoxy shall be of the type recommended or supplied by the pipe manufacturer.
13. **Warranty:** A five year warranty shall be furnished by the manufacturer on the service ability of the lining. This warranty shall include, but not be limited to the statement, at any time up to the end of the fifth year from the date of pipe shipment:
  - a. The lining shall not have disbound.

- b. The lining shall not have suffered any appreciable underfilm migration.
- c. The interior pipe metal, at points of pinholes or holidays, shall not have suffered detrimental deterioration.
- d. The lining shall have maintained its smooth surface characteristics.

Contractor and/or manufacturer shall not make any exemption or exception to above stated conditions or warranty within the limits as stated in this section of specifications.

- 14. **Certification:** The manufacturer shall furnish notarized certificates of compliance stating that the lining conforms to all requirements of these specifications.

#### 4. CONSTRUCTION METHODS

##### **4.1 HANDLING AND STORAGE OF MATERIALS**

- A. **General:** The Contractor shall be responsible for the safe storage of all material furnished to or by him and accepted by him until it has been incorporated in the completed project.

All material found during the progress of the work to have cracks, flaws or other defects will be rejected, and the Contractor shall remove such defective material from the site of the work.

- B. **Unloading and Distribution of Materials at Work Site:** Pipe and other materials shall be unloaded at point of delivery, hauled to, and distributed at the job site by the Contractor. Materials shall at all times be handled with care and in accordance with manufacturer's recommendations. Care shall be taken not to scratch PVC pipe. Excessive scratching shall be considered cause for rejection of PVC pipe. Materials may be unloaded opposite or near the place where it is to be installed provided that it is to be incorporated into the work within ten days. The Contractor shall not distribute material in such a manner as to cause undue inconvenience to the public.
- C. **Storing Materials:** Materials that are not to be incorporated into the work within 10 days shall be stored on platforms. The interior of pipes and accessories shall be kept free from dirt and foreign matter.

##### **4.2 INSTALLATION**

- A. **Alignment and Grade:** All pipes shall be laid and maintained to the required line and grade.

Temporary support and adequate protection of all underground and surface utility structures encountered in the progress of the work shall be furnished by the Contractor.

Where the grade or alignment of the pipe is obstructed by existing utility structures such as conduits, ducts, pipes, connections to sewers or drains, the obstruction shall be permanently supported, relocated, removed, or reconstructed by the Contractor at the Contractor's expense, in cooperation with the owners of such utility structures.

Force Mains shall be laid with no less than 36 inch cover, unless indicated otherwise in the drawings. Greater depths will be permitted when required to avoid conflicts with existing structures.

Lines shall be laid to grade which permit entrapped air to flow to a high point for release through an air release valve as shown on the drawings. The Contractor shall investigate well in advance of pipe laying for conflicts which may necessitate the readjustment of planned line and grade.

- B. **Trench Excavation and Backfill:** See Standard Specification Section 022020 "Excavation and Backfill for Utilities and Sewers" and drawings.
- C. **Force Main Connection to Existing Manhole:** Where new force main is connected to existing manhole, the manhole shall be prepared to receive the proposed force main and restored after connection. Manhole inverts shall be repaved as necessary to provide a smooth flowing system.
- D. **Polyethylene Encasement:** All metallic pipe, valves and fittings, except those which occur in encasement pipe or in concrete valve boxes, shall be wrapped in polyethylene. The polyethylene material shall have a thickness of 8 mil and may be either clear or black. The wrapping shall be lapped in such manner that all surfaces of pipe valves and fittings, including joints, shall have a double thickness of polyethylene. If a single longitudinal lap is made, using a double thickness of polyethylene, it shall be lapped a minimum of 18 inches and the lap shall be placed in the lower quadrant of the pipe and in such a manner that backfill material cannot fall into the lap. The polyethylene shall be secured in place with binder twine at not more than 6-foot intervals. If wrapping is applied before the pipe is placed in the trench, then special care shall be taken in handling the pipe so that the wrapping will not be damaged. Care shall also be exercised in backfilling around the pipe and fittings and in blocking fittings so as not to damage the wrapping. Any wrapping that may be damaged shall be repaired in a manner satisfactory to the Engineer and so as to form the best protection to the pipes.
- E. **Sand Encasement:** Sand shall be granular soil of low plasticity such that 100% pass a #4 sieve and no more than 10 % pass a #200 sieve and the PI shall not exceed 10. Soils with a Unified Classification of SW and SP, or AASHTO Classification of A3 and some A2 soil shall be required.
- F. **Pre-Placement Inspection:** Prior to lowering into trench, all pipe and accessories shall be inspected for defects. All foreign matter or dirt shall be removed from the interior of pipe, prior to lowering into trench. Pipe shall be kept clean at all times during the laying.
- G. **Jointing Pipe and Fittings:** All pipes and fittings shall be made up in accordance with manufacturer's recommendation. Pipe deflection shall not exceed 75% of the maximum amount recommended by the manufacturer.
- H. **Concrete Thrust Blocks:** Thrust backings shall be applied at all bends, tees, incomplete crosses and blow-offs, unless shown otherwise on the plans. The size and shape of the thrust blocking shall be as shown on the plans. Materials for the backings shall be minimum 2,000 psi concrete and shall be placed between solid ground and the fittings to be anchored. The sizes of thrust blocking is indicated on the drawings.

The backing shall be placed so that the pipe and fitting joints will be accessible for repair.

Temporary thrust blocks or other means of carrying thrust loads generated by hydrostatic testing shall be provided at all ends of lines to be tested. Details of the end connections and method of temporary blocking shall be submitted to the Engineer for approval.

After satisfactory completion of the hydrostatic test, this temporary blocking shall be removed so that connections may be made with existing lines. This work is subsidiary and no separate payment will be made for it.

- I. **Restrained Joints and Fittings:** Metal harness, tie rods and clamps or restrained fittings shall be used to prevent movement when soil conditions will not withstand thrust blocking. Steel rods and clamps shall be galvanized or otherwise rustproofed or coated with hot coal tar enamel then wrapped with two layers of polyethylene wrapping.

#### **4.3 HYDROSTATIC TESTING SANITARY FORCE MAIN**

See Standard Specification Section 026202, Hydrostatic Testing of Pressure System.

#### **5. MEASUREMENT AND PAYMENT**

Unless indicated otherwise in the Proposal, sanitary sewer force mains will be measured by the linear foot along the center line of pipe. Measurement shall include, but not be limited to, trenching, dewatering, pipe, bedding, thrust blocks, fittings, restraints, and backfill. Payment shall include all labor, materials, equipment, and incidentals required to complete the work at the unit price bid.

SECTION 026604  
AIR RELEASE VALVES (S-96)  
(WASTEWATER APPLICATION)

1. Description

This specification shall govern all work necessary to furnish and install all air release valves and accessories required to complete the work as shown on the drawing.

2. Air Release Valve

The automatic sewage air release valve shall be designed to operate under pressure to allow entrapped air to escape from a sewage force main line, sewage pump, or wastewater system. After the air escapes out of the air release valve, the valve shall shut off until more air accumulates in it and the opening cycle will repeat automatically.

The sewage air release valve must have a compound internal linkage of precision molded delrin. All other internals must be stainless steel to positively prevent galvanic action. The float rod shall be 20" long to provide an air gap between the linkage and waste level inside the valve to retard the waste solids from clogging the linkage. Each valve shall be complete with hose and blow-off valves to permit back flushing without dismantling valve.

Body and Cover	Cast Iron	ASTM A48, Class 30
Internal Delrin Linkage		ASTM D2133
Stainless Float		ASTM A240
Buna-N		ASTM SB800
Exterior Paint	Red Lead	TTP 86 B, Type IV

Valve Height 17" - with back flushing attachments - 25"  
Inlet Size = 2" I.P.T.  
Orface Size = 5/16"  
Minimum Capacity = 20 CFM @ 15 PSIG  
Operating Pressure Range = 10 to 25 PSIG  
Type: APCO 400 WA or approved equal

Accessories

Service Saddle: See Drawings  
Two - 2" I.P.T. Short Nipples  
One - 2" I.P.T. Shut-Off Valve (Gate Valve)  
One - 1" I.P.T. Short Nipple  
One - 1" I.P.T. Blow-Off Valve (Gate Valve)  
One - 1" I.P.T. 90° Elbow  
One - 1" I.P.T. Nipple  
One - 1" I.P.T. Shut-Off Valve (Gate Valve)  
Two - 1" I.P.T. Quick Connect Valve Couplings  
One - Rubber Hose (10' Minimum Length) with Two Quick  
Connect Couplings for In Place Back Flushing

3. Operation & Maintenance Manual and Field Service

The Contractor shall submit five (5) sets of detailed drawing and specifications with installation instructions and maintenance procedures for the Engineer's review prior to installation. The manufacturer's field representative shall check installation and make any required adjustments prior

to operation of system.

4. Measurement and Payment

Unless indicated otherwise in the Proposal, Air Release Valves and accessories shall be measured as units and shall include but not be limited to valve, accessories and vault. Payment shall include all material, labor, and incidentals required to complete the work.

SECTION 026608  
SMOOTH WALL HIGH DENSITY POLYETHYLENE PIPE FOR  
SLIPLINING (S-59A)

(Force Main Sewers)

1. SCOPE

This specification shall govern all work necessary for furnishing and installing smooth wall, high density polyethylene pipe required to complete the sliplining of existing sanitary sewer lines.

2. MATERIALS

- 2.1 Polyethylene: The material used for the liner and for the service taps shall be the same materials as designated below.

ASTM Designation: D-3350 with a cell classification of PE345434C. In addition, the liner shall be manufactured of polyethylene resins classified as Type III, Class C, Category 5 Grade P34 as tabulated in specifications in the older ASTM Designation, D1248. This material shall also conform to the design criteria as specified in Plastic Pipe Institute (PPI) Designation: PE34C8.

If requested by the owner, the pipe and fitting manufacturer shall provide certified copies of the quality control data taken during product manufacture.

Pipe and fittings shall be produced by the same manufacturer from identical materials meeting the requirements of these specifications.

Pipe and fittings shall be pressure rated to meet the service pressure requirements specified by the Design Engineer. Whether molded or fabricated, fittings shall be fully pressure rated to at least the same service pressure rating as the pipe to which joining is intended.

Molded fittings shall meet the requirements of ASTM D-3261 and this specification. At the point of fusion, the outside diameter and minimum wall thickness of fitting butt fusion outlets shall meet the outside diameter and minimum wall thickness specifications of ASTM F-714 for the same size of pipe. Fitting markings shall include a production code from which the location and date of manufacture can be determined. Upon request, the manufacturer shall provide an explanation of his production code.

Fitting shall be manufactured in production facilities designed for that purpose. Field fabricated fittings are not allowed.

Pipe shall be manufactured in accordance with ASTM F-714, ASTM D-3035, or the applicable dedicated service specification. Printline markings shall include a production code from which the location and date of manufacture can be identified. Upon request, the manufacturer shall provide an explanation of his production code.

- 2.2 Pipe Rating: The pipe shall have a manufacturer's recommended hydrostatic design stress rating of at least 800 p.s.i. based on a material with a 1600 p.s.i. design basis determined in accordance with ASTM D 2837-69, Standard Method for Obtaining Hydrostatic Basis for Thermoplastic Pipe Materials.

2.3 Dimensions:

<u>Sewer Line I.D.Inches</u>	<u>Nominal O.D. of Liner (Inches)</u>	<u>Min.Wall Thickness Liner (Inches)</u>
24 (CIOD)	22.00	1.95

2.4 Liner Diameter: The inside diameter of the liner pipe at any point shall not vary from the nominal inside diameter by more than one percent or one quarter inch, whichever is greater.

2.5 Wall Thickness: The polyethylene lining to be used shall have a wall thickness that yields an SDR (Standard Dimension Ratio) of 11 or less. The SDR shall be calculated by dividing the outside diameter of the pipe by its minimum wall thickness. The average wall thickness of the liner pipe shall not be less than the nominal wall thickness published in the manufacturer's literature current at the time of purchase and the wall thickness at any point shall not vary from the nominal by more than 10 percent. The manufacturer shall provide sufficient data to demonstrate that the pipe supplied provides a 50 year service life with a maximum external hydrostatic pressure of 10 feet of water above the pipe center line.

All pipe shall be homogenous throughout, and shall be free of visible cracks, holes, foreign materials, blisters, or other deleterious faults. All materials shall be of the highest quality and highest performance. It shall be the product of a manufacturer actively engaged in research, development, and the manufacturer of said materials.

3. CONSTRUCTION METHODS

3.1 Cleaning: All lines to be relined shall be cleaned prior to installation of liner. The Contractor shall select the method of cleaning. All materials resulting from the cleaning operations shall be removed at the downstream manhole of the section being cleaned.

Television Inspection - Upon completion of the cleaning operation and prior to insertion of the liner material, a closed circuit television camera will be pulled through each line. The interior of the main shall be carefully inspected to determine the location and extent of any condition which may prevent proper installation of lining materials.

A television report log and video tape shall be furnished on each line inspected. The observations are to be recorded on a television inspection form. This log shall indicate the internal condition of the sewer segment, the deviations in line and grade, abnormal conditions of the pipe barrel and joints, and the location and quantity of each source of infiltration and inflow. The distance from the beginning manhole shall be noted for each observation made on the report form. Photographs of each defect shall be made from the television monitor for further study and justification for rehabilitation.

All observed obstructions shall be removed by the Contractor before initiating liner insertion. All excavation and backfilling for removal of obstructions, liner insertions, manhole rehabilitation and side sewer connection, if any, shall conform to requirements set out in this specification.

3.2 Bypass Sewage: It shall be the responsibility of the Contractor to bypass the sewage, if necessary, around the section or sections of line that are to be sliplined. Under no circumstances will dumping of raw sewage on private or City property be allowed. Bypass shall be made by pumping the sewage into a downstream manhole or adjacent system, or other methods as



may be approved by the Owner and the Engineer. The pump and bypass line shall be of adequate capacity to handle the flow. If bypass pumping is not a continuous operation, flow through the sewer line shall be restored at the end of a work day. Complete plugging of the existing line will not be permitted unless adequate bypass capacity for anticipated flows is provided or other means of handling the flows is approved by the Engineer.

- 3.3 Pipe Jointing: Sections of the Polyethylene (PE) liner pipe shall be joined into continuous lengths on the job site above ground. Joining shall be accomplished by the butt-fusion method and performed in strict conformance with the pipe manufacturer's recommendations using approved equipment. Except where flange connections or mechanical connections are specified, pipe and fittings as determined by the Engineer shall be butt-fusion joined in accordance with the manufacturer's recommended procedure. Before construction begins, the Contractor shall furnish to the Engineer for his review and approval, four copies of all details of the butt-fusion jointing procedure proposed for use. The Contractor shall make arrangements to have a technical representative of the pipe manufacturer present for the start-up of the butt-fusion jointing and training of the Contractor's personnel, or arrangements shall be made for the pipe manufacturer's representative to remain on the job until all jointing has been completed. When requested by the Engineer, samples of butt-fusion joints shall be furnished by the Contractor for laboratory testing. The test of such samples shall clearly demonstrate joint integrity, strength, etc.
- 3.4 Insertion: After completing the access shaft excavation, the top half of the existing sewer down to the spring line shall be broken or cut and removed for the full length of the access shaft. A power winch cable shall then be connected to the end of the liner by use of fabricated or flexible pulling head so that the liner can be pulled into the existing sewer. Precautions shall be taken not to damage the liner by scoring on a ragged edge of the old sewer line during sliplining. Whenever possible, liner shall be pulled through manholes and liner sections shall be joined in pits other than in manholes. The purpose of this requirement is to (1) provide a smooth invert without grouting and a uniform condition for manhole rehabilitation and (2) minimize the number of insertion pits. Details for joining of liner section in manholes shall be submitted to the Engineer for approval prior to construction. Sufficient time (minimum 12 hours) shall be allowed after pulling the pipe for the pipe to recover to its original length since polyethylene liner will elongate due to stress during pulling, and allow for stabilization of length due to temperature. During the installation of the liner, should the liner break or separate, the excavation required to rejoin the pipe and all other work necessary to complete such repair shall be done for no separate pay.
- 3.5 Service Connections: After the liner has been pulled into place, allowed to recover, and secured to the manhole walls, each side sewer service shall be connected to the new liner. Service laterals shall be connected by the use of an approved remote tapping system or a prefabricated saddle. If the prefabricated saddle is used, a neoprene gasket shall be installed between the saddle and the liner pipe so that a complete water seal is accomplished when the two piece saddle is placed around the polyethylene pipe and pulled together with stainless steel bands. Inspection of this line did not reveal any connections to the sewer except at manholes. Laterals connecting to existing manholes shall be reconnected to the rehabilitated manhole as shown on the drawings and to the satisfaction of the Engineer.
- 3.6 Backfill: At all points where the liner pipe has been exposed, as in access shafts, outside of manholes, service connections, etc., the Contractor shall remove all debris and create a void along each side of the pipe at the spring line to undisturbed soil. Width of the void shall not exceed existing pipe O.D. plus four feet. Suitable spacers shall be

used to center the liner within the existing pipe, or hold the liner at the top of the existing pipe. The space between the liner and the pipe shall be filled with cement grout which shall contain a minimum of seven sacks of cement per cubic yard of sand and enough water (but no more) to provide a mixture that will flow around the pipe. As the bottom portion of this grout begins to set up, a drier mix shall be placed on top of the liner until a cover over the liner approximately the O.D. of the existing pipe is formed. In the voids along each side of the existing pipe, the Contractor shall place cement stabilized sand consisting of 3 sacks of Portland Cement per cubic yard of fine aggregate for concrete, mixed dry and placed in six inch lifts for the full width and length of the excavation and shall also be placed over the above described grout until a depth of twelve inches over the top of the original pipe is achieved. Each lift shall be hand tamped and utmost care shall be exercised to avoid damaging the inserted liner pipe and its encasement of the existing pipe. After the stabilized sand is in place and accepted by the Engineer, backfilling to finished grade may be completed using material from the excavation, select material or cement stabilized sand, all at the Contractor's option and as approved by the Engineer.

- 3.7 Sealing Manholes: The annular space between the polyethylene liner and the existing sewer line shall be sealed where the sewer link enters or exits each manhole. The annular space may be sealed with a mechanical device, chemical seal, or quick setting concrete. The method chosen shall be approved by the Engineer prior to construction.
- 3.8 Grouting Annular Space: The annular space between the polyethylene liner and the existing pipe shall be filled with a grout having good flow characteristics, minimum shrinkage, and permanence of support. One suggested mix design per cubic yard is: 500 lbs. of 3/8" washed river gravel (rounded), 2,100 lbs. ± of sand, 7 sacks of Portland Cement and 21 ounces (3 ounces per sack of cement) of Pozzolite 300R as manufactured by Master Builders, or Sikamix 100 as manufactured by Sika Chemical Corporation, or equal. The gravel may be omitted if proven to be of no benefit. Another suggested mix design per cubic yard is: 1,150 lbs. of sand, 400 lbs. of fly ash, 658 lbs. of cement and 83 gal. of water. If neither of these mix designs is used, the Contractor shall submit a mix design to the Engineer for approval prior to beginning the grouting process. It is intended that the annular space be 100% filled, but particular attention must be paid to those areas just downstream of manholes to avoid air traps. Equipment for placement of grout shall be used so as to prevent segregation of the grout components and to cause the grout to flow around the liner and completely fill the voids in the annular space. Under no circumstances shall grout be dropped down the shafts onto the polyethylene liner. Grout shall not be permitted to rise in the vertical shafts more than two feet above the top of the existing pipe. The Contractor shall have operable vibrators on the job to aid the flow of the grout. The Contractor shall have operable pumps on the job site to remove water from the vertical shafts as it is displaced by grout to prevent an excessive hydrostatic head on the polyethylene liner. Grouting method details shall be submitted for approval.
- 3.9 New Manholes: In those places where the main access shaft is excavated at an existing manhole, the manhole will be replaced with a new manhole. The new manhole shall essentially be equal to the rehabilitated manhole shown on the drawings except that a concrete vault will not have to be constructed at the bottom. Details of such construction shall be subject to review and approval by the Engineer before construction. All materials shall be new and the best quality and workmanship shall be that of skilled craftsmen. New manholes constructed under this section shall not be reason for extra compensation. All materials not used in the backfilling operation shall be disposed of off site by the Contractor and all areas must be restored to their original conditions.

#### 4. CLEANUP

After all installation work has been completed, the Contractor shall clean up the area around the work area and return the ground cover to a like or better condition as existed prior to construction. All pavement shall be repaired as specified. All broken pipe, and other material not a part of the ground cover shall be hauled off and properly disposed of by the Contractor.

#### 5. MEASUREMENT AND PAYMENT

- 5.1 Measurement: Unless specified otherwise in the Special Provisions, Sanitary Sewer Sliplining will be measured by the linear foot for each size installed.
- 5.2 Payment: Unless specified otherwise in the Special Provisions, Sanitary Sewer Sliplining shall be paid by the linear foot for each size installed, complete in place.

SECTION 026610  
REINFORCED PLASTIC MORTAR (RPM) LINER PIPE FOR SLIPLINING (S-67)

1. SCOPE

- 1.1 This specification covers constant outside diameter reinforced plastic mortar (RPM) pipe intended for use as a liner to rehabilitate existing sewer pipelines conveying sanitary sewage, stormwater and those industrial wastes and corrosive fluids for which the pipe is determined to be suitable.
- 1.2 The RPM pipe furnished under this specification shall be a composite structure manufactured from thermosetting resin, glass fiber reinforcement and aggregate. The RP shall have a chemical resistant resin inner surface liner meeting ASTM specification D3262. This liner shall be capable for conveying sewage flows with a pH range lower than 3 and higher than 11.
- 1.3 Liner pipe furnished under this specification shall be furnished in classes designated as GRAVITY, intended to operate at up to 25 feet of water head (10 psig) external pressure, and 115 feet of water head (50 psig) internal pressure.

2. MATERIALS

- 2.1 The structure of the pipe shall be composite consisting of a resin binder, an aggregate filler and fiberglass reinforcement.

**Resin** - The resin shall be catalyzed isophthalic polyester resin.

**Aggregate** - The aggregate shall be a siliceous sand conforming to the requirements of the current specifications for concrete aggregate (ASTM C-33), except that the requirements for gradation shall not apply.

**Fiberglass** - The fiberglass reinforcement shall be a borosilicate "E" type glass roving with a polyester compatible finish.

**Liner** - The chemical resistant resin liner shall be a reinforced thermosetting resin without aggregate filler.

- 2.2 The gaskets used with this pipe shall have a round cross section and shall conform to the requirements of ASTM F-477, "Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe". Gasket material shall be chemically resistant to the fluids described in Section 026610.1.2.

3. PHYSICAL REQUIREMENTS

- 3.1 Axial Compressive Strength - Each length of liner pipe shall have sufficient strength to withstand, without structural damage, the axial compressive proof load specified below:

<u>Nominal Size (Inches)</u>	<u>Axial Compressive Proof Load (1 lbs.)</u>
36	90,000
42	110,000

when tested in accordance with the following:

The axial compression proof load shall be uniformly applied to the bearing faces of the liner pipe section for a period of not less than 30 seconds. There shall be no structural damage to the liner pipe wall. The pipe shall pass the hydrostatic soundness test after withstanding the axial compressive proof load.

- 3.2 Hydrostatic Soundness - Liner pipe shall be capable of withstanding, without leakage, the hydrostatic proof pressure below:

HYDROSTATIC PROOF PRESSURE

<u>Rated Operating Pressure psi (feet of water)</u>	<u>Hydrostatic Proof Pressure psi (feet of head)</u>
Gravity (25)	25 (60)
50 (115)	100 (230)

when tested in accordance with the following:

Place the liner pipe in a hydrostatic pressure testing machine which seals the ends and exerts no end loads. Then fill the liner pipe with water, expelling all air, and apply internal pressure at a uniform rate until the specified test pressure is reached. The pressure shall be maintained for one minute to assure hydrostatic soundness.

- 3.3 **Joints** - Inverted bell and spigot joints shall be furnished. The outside diameter of the liner pipe shall be constant over its entire length and shall be sealed with a solid, uniform cross section gasket conforming to Section 026610.2.2. The gasket shall be contained in a groove and shall not support the weight of the pipe when two sections are joined. The joint assemblies shall be so formed that when pipe sections are drawn together, the pipe shall form a continuous watertight conduit, and shall provide for slight movements of any pipe in the pipeline due to contraction, settlement, or lateral displacement.

- 3.4 **Stiffness Factor** - The fitness factor shall be as follows when tested in accordance with the method of ASTM D-3262.

STIFFNESS FACTOR REQUIREMENTS

<u>Nominal Size (Inches)</u>	<u>Minimum Stiffness Factor (lbs.-in.2/in.)</u>
36	8,690
42	13,799

- 3.5 **Beam Strength** - The beam strength of liner pipe shall be as follows when tested in accordance with ASTM D-3262. This is a design qualification requirement and a copy of the manufacturer's test report shall be the basis of acceptance.

MINIMUM BEAM STRENGTH

<u>Nominal Size (inc.)</u>	<u>Beam Load, P (lbg)</u>	<u>Alternative Axial Flexure Min. Longitudinal Tensile Strength (lbf/inch circum.)</u>	<u>Strength Requirements Min. Longitudinal Compressive Strength (lbs/inch circum.)</u>
36	----	700	700
42	----	800	800

4. DIMENSIONS AND PERMISSIBLE VARIATIONS

- 4.1 **Inside Diameter** - The diameter of the liner pipe, except at the joints, shall not be less than the nominal by more than one and one-half percent or one quarter inch, whichever is greater.
- 4.2 **Laying Lengths** - The laying length of each line pipe section shall be as follows:
- Inverted Bell and Spigot - 20 feet, 3 inches ± 1 inch
- 4.3 **Wall Thickness** - The minimum wall thickness of the liner pipe barrel shall be as follows:

<u>Nominal Size, Inches</u>	<u>Minimum Wall Thickness, Inc.</u>
36	0.28
42	0.32

## 5. WORKMANSHIP, FINISH AND APPEARANCE

- 5.1 The inside surface of each liner pipe shall conform to the requirements of ASTM D-3262 and shall be free of bulges, dents, ridges, or other defects that result in a variation of inside diameter of more than one-eighth inch from that obtained on adjacent unaffected portions of the surface.
- 5.2 Joint sealing surfaces shall be free of dents and gouges that will affect the integrity of the joints.
- 5.3 No glass fiber reinforcement shall penetrate the interior surface of the pipe wall.

## 6. CONSTRUCTION

### 6.1 General

- a. **Insertion Pits** - The Contractor shall provide all necessary pits to completely reline the sewers. The location of any access pits shall be subject to the approval of the Engineer. The number of access pits shall be minimized.
- b. **Access Pits and Lateral Connection Excavations** - Access pits shall be constructed to the minimum size necessary for insertion of liner pipe. All pits shall be constructed with properly applied vertical side support. At access pits, lateral service connections and at all points where liner pipe is exposed, the Contractor shall encase liner and fittings as detailed in the plans.
- c. **Pipe Stockpiling and Handling** - Pipe and fittings shall be stockpiled in a safe manner at each contractor staging area or liner pit location. The stockpiling shall be arranged to cause a minimum of interference to pedestrian and vehicular traffic. No stockpiling will be permitted on the opposite side of the street from construction without prior approval of the Engineer. When handling liner pipe, the Contractor shall take all precautions necessary to avoid damage to the pipe. Dragging of the pipe over sharp objects shall be avoided. Pipe with deep cuts, scratches or gouges shall be rejected and replaced.

### 6.2 Liner Pipe Installation

- a. **General** - Liner pipe grade shall be maintained equal to the grade of the sewer being relined. As the work progresses, the interior of the pipe shall be cleared of all dirt and debris. At times when work is not in progress for whatever reason, open ends of pipe or fittings shall be protected.

Pipe shall not be installed if the condition of the existing sewer line is unsuitable, or if the weather is such that anticipated sewer flows will be in excess of those flows maintained during insertion.

The Contractor shall make all necessary arrangements and provide all necessary equipment to maintain sewage flows at all times. This shall be accomplished by allowing flows to pass around and through the liner pipes or by other means acceptable to the Engineer.

- b. **RPM Liner Pipe Installation** - Within the insertion pit, the top half of the exposed existing pipe is to be removed to the springline. The bottom half is to be left in place where it shall serve as a cradle for the liner pipe. The liner pipe shall be either jacked into the existing pipe or pushed as determined by the Contractor. An aqueous solution of Bentonite may be used as a lubricant to minimize jacking loads. A tapered guide shall be attached to the leading end of each section to be installed to help pipe clear small obstructions. A jacking ring shall be used to distribute load as per manufacturer's recommendations for installation of the liner pipe. For each section to be laid, insertion shall be one continuous operation until the planned termination point is reached. Closure in the insertion pit after jacking may be accomplished using a long bell closure kit or other methods, as approved by the Engineer.

Pipe jointing shall be carried out in strict accordance with the manufacturer's recommendation. Total jacking loads shall not exceed the values recommended by the manufacturer. The Contractor shall provide a suitable means for measuring jacking loads, and shall monitor the load as the liner pipe is being installed. If at any time the load appears to rise non-uniformly, indicating possible obstruction of the pipe, jacking operations shall be terminated and the obstruction removed before continuing.

- c. **Manhole Replacement** - In those places where the entrance pit is excavated at an existing manhole, the manhole shall be repaired or it shall be replaced with a new manhole conforming to the section on manhole construction and, further, in accordance with Standard Details included in the drawings.

- 6.3 **Manholes** - Pipe at manholes shall be grouted one pipe diameter back from inside edge of manholes. The liner pipe shall be cut out at manholes as detailed after insertion and grouting. The method of cutting shall be such as to leave a smooth clean straight plastic edge. Where detailed or required mild steel ties shall be provided as required to tie the liner to the manhole benching. The liner pipe shall be suitably strutted or blocked during grout and concrete placement so that no bowing or other deviation from a parallel sided channel occurs.

- 6.4 Pipe grade shall be maintained within the limit shown on the drawing. The Contractor shall be responsible for and take all necessary precautions to ensure that no liner pipe flotation, adverse pipe grades, or pipe rotation about the vertical axis results, or collapse of the liner pipe occurs during grouting operations. Multiple low pressure application grout lifts are recommended. Grouting shall be in accordance with Section 027610.3.7.



6.5 **Measurement and Payment** - Unless indicated otherwise in the Proposal, Reinforced Plastic Mortar Pipe for Sliplining shall be measured and paid for by the linear foot, complete in place.

SECTION 026612  
GLASS FIBER REINFORCED LINER PIPE FOR SLIPLINING (S-67A)

1. SCOPE

- 1.1 This specification covers glass fiber reinforced plastic mortar pipe intended for use as a liner to rehabilitate existing pressurized pipelines conveying sanitary sewage, stormwater and those industrial wastes and corrosive fluids for which the pipe is determined to be suitable.
- 1.2 The pipe furnished under this specification shall be a composite structure manufactured from thermosetting resin, glass fiber reinforcement and aggregate. The pipe shall have a chemical resistant resin inner surface liner meeting ASTM specification D-3754. This liner shall be capable of conveying sewage flows with a pH range lower than 3 and higher than 11.
- 1.3 Liner pipe furnished under this specification shall be furnished in classes designated as C150, intended to operate at up to 150 psig internal pressure.

2. MATERIALS

- 2.1 The structure of the pipe shall be a composite of resin binder, an aggregate filler and fiberglass reinforcement.

Resin - The resin shall be a thermosetting polyester or epoxy resin.

Aggregate - The aggregate shall be siliceous and conform to the requirements of the current specifications for concrete aggregate (ASTM C-33), except that the requirements for gradation shall not apply.

Fiberglass - The fiberglass reinforcement shall be a borosilicate "E" type glass roving with a polyester compatible finish.

Liner - The chemical resistant resin liner shall be a reinforced thermosetting resin without aggregate filler.

- 2.2 The gaskets used with this pipe shall conform to the requirements of ASTM F-477, "Specifications for Elastomeric Seals (Gaskets) for Joining Plastic Pipe." Gasket material shall be chemically resistant to the fluids described in Section 026612.1.2.

3. PHYSICAL REQUIREMENTS

- 3.1 Axial Compressive Strength - Each length of liner pipe shall have sufficient strength to withstand, without structural damage, an axial compressive proof load of 110% of the minimum longitudinal compressive strength shown in the beam strength requirements of ASTM D-3754. The pipe shall pass the hydrostatic soundness test after withstanding the axial compressive proof load.
- 3.2 Hydrostatic soundness - Liner pipe shall meet the requirements of ASTM D-3754.
- 3.3 Joints - The liner pipe shall be sealed with a solid, uniform cross section gasket conforming to Section 026612.2.2. The gasket shall be contained in a groove and shall not support the weight of the pipe when

two sections are joined. The joint assemblies shall be so formed that when pipe sections are drawn together, the pipe shall form a continuous watertight conduit, and shall provide for slight movements of any pipe in the pipeline due to contraction, settlement or lateral displacement.

- 3.4 Stiffness Factor - Liner pipe shall meet the requirements of ASTM D-3754.
- 3.5 Beam Strength - The beam strength of the liner pipe shall meet the requirements of ASTM D-3754. This is a design qualification requirement and a copy of the manufacturer's test report shall be the basis of acceptance.

#### 4. DIMENSIONS AND PERMISSIBLE VARIATIONS

- 4.1 The nominal size of liner pipe furnished for this project will be 18 inch cast iron pipe equivalent diameter.
- 4.2 The inside diameter of the liner pipe at any point shall not vary from the nominal inside diameter by more than one percent or one quarter inch, whichever is greater.
- 4.3 The typical laying length of each liner pipe sections shall be 20 feet, plus or minus 2 inches. Other laying lengths will require the approval of the Engineer.
- 4.4 The average wall thickness of the pipe shall not be less than the nominal wall thickness published in the manufacturer's literature current at the time of purchase, and the wall thickness at any point shall not vary from the nominal by more than 10 percent.

#### 5. WORKMANSHIP, FINISH AND APPEARANCE

- 5.1 The inside surface of each liner pipe shall conform to the requirements of ASTM D-3754 and shall be free of bulges, dents, ridges, or other defects that result in a variation of inside diameter of more than one-eighth inch from that obtained on adjacent unaffected portions of the surface.
- 5.2 Joint sealing surfaces shall be free of dents and gouges that will affect the integrity of the joints.
- 5.3 No glass fiber reinforcement shall penetrate the interior surface of the pipe wall.

#### 6. CONSTRUCTION

##### 6.1 General

The Contractor shall provide all necessary pits to completely reline the sewers. The location of any access pits shall be subject to the approval of the Engineer. The number of access pits shall be kept to a minimum.

Access pits shall be constructed to the minimum size necessary for insertion of liner pipe. All pits shall be constructed with properly applied vertical side support. At access pits, lateral service connections, and at all points where liner pipe is exposed, the Contractor shall encase liner and fittings as detailed in the plans.

Pipe and fittings shall be stockpiled in a safe manner at each Contractor

staging area or liner pit location. The stockpiling shall be arranged to cause a minimum of interference to pedestrian and vehicular traffic. No stockpiling will be permitted on the opposite side of the street from construction with prior approval of the Engineer. When handling liner pipe, the Contractor shall take all precautions necessary to avoid damage to the pipe. Dragging of the pipe over sharp objects shall be avoided. Pipe with deep cuts, scratches or gouges shall be rejected and replaced.

## 6.2 Liner Pipe Installation

Liner pipe grade shall be maintained equal to the grade of the sewer being relined. At times when work is not in progress for whatever reason, open ends of pipe or fittings shall be protected.

Pipe shall not be installed if the condition of the existing sewer line is unsuitable or if the weather is such that anticipated sewer flows will be in excess of those flows maintained during insertion.

The Contractor shall make all necessary arrangements and provide all necessary equipment to maintain sewage flows at all times. This shall be accomplished by allowing flows to pass around and through the liner pipes or by other means acceptable to the Engineer. The Contractor will be responsible for any necessary bypassing of sewage around the section of sections or line to be sliplined. Under no circumstances will dumping of raw sewage on private or City property be allowed. Bypass shall be made by pumping the sewage into a downstream manhole or adjacent system, or other methods as may be approved by the Owner and the Engineer. The pump and bypass line shall be of adequate capacity to handle the flow. If bypass pumping is not a continuous operation, flow through the sewer line shall be restored at the end of each work day. Complete plugging of the existing line will not be permitted unless adequate bypass capacity for anticipated flows is provided or other means of handling the flows is approved by the Engineer.

Cleaning - All lines to be rehabilitated shall be cleaned prior to the installation of the liner. The Contractor shall select the method of cleaning. The Contractor shall take such precautions as necessary to protect the line from further damage during the cleaning process and shall be responsible for repairing any such damages. All materials resulting from the cleaning operations shall be removed at the downstream manhole of the section being cleaned.

Television Inspection - Upon completion of the cleaning operation and prior to insertion of the liner material, a closed circuit television camera will be pulled through each line. The interior of the main shall be carefully inspected to determine the location and extent of any condition which may prevent proper installation of lining materials.

A television report log and video tape shall be furnished on each line inspected. The observations are to be recorded on a television inspection form. This log shall indicate the internal condition of the sewer segment, the deviations in line and grade, abnormal conditions of the pipe barrel and joints, and the location and quantity of each source of infiltration and inflow. The distance from the beginning manhole shall be noted for each observation made on the report form. Photographs of each defect shall be made from the television monitor for further study and justification for rehabilitation.

Liner Pipe Installation - Within the insertion pit, the top half of the exposed existing pipe is to be removed to the springline. The bottom half is to be left in place where it shall serve as a cradle for the liner pipe. The liner pipe shall be either jacked into the existing pipe or

pushed as determined by the Contractor. An aqueous solution of bentonite may be used as a lubricant to minimize jacking loads. A tapered guide shall be attached to the leading end of each section to be installed to help pipe clear small obstructions. A jacking ring shall be used to distribute load as per manufacturer's recommendations for installation of the liner pipe. For each section to be lined, insertion shall be one continuous operation until the planned termination point is reached. Closure in the insertion pit after jacking may be accomplished using a long bell closure kit or other methods, as approved by the Engineer.

Pipe jointing shall be carried out in strict accordance with the manufacturer's recommendations. Total jacking loads shall not exceed the values recommended by the manufacturer. The Contractor shall provide a suitable means for measuring jacking loads, and shall monitor the load as the liner pipe is being installed. If at any time the load appears to rise non-uniformly, indicating possible obstruction of the pipe, jacking operations shall be terminated and the obstruction removed before continuing.

Manhole Replacement - In those places where the entrance pit is excavated at an existing manhole, the manhole shall be repaired or it shall be replaced with a new manhole conforming to the section of manhole construction and, further, in accordance with Standard Details included in the drawings.

- 6.3 Manholes - Pipe at manholes shall be grouted one pipe diameter back from inside edge of manholes. The liner pipe shall be cut out at manholes as detailed after insertion and grouting. The method of cutting shall be such as to leave a smooth clean straight plastic edge. Where detailed or required, mild steel ties shall be provided to tie the liner to the manhole benching. The liner pipe shall be suitably strutted or blocked during grout and concrete placement so that no bowing or other deviation from a parallel sided channel occurs.
- 6.4 Pipe grade shall be maintained within the limits shown on the drawings. The Contractor shall be responsible for and take all necessary precautions to ensure that no liner pipe flotation, adverse pipe grades, or pipe rotation about the vertical axis results, or collapse of the liner pipe occurs during grouting operations. Multiple low pressure application grout lifts are recommended. Grouting shall be in accordance with Section 026608.3.8.
- 6.5 Measurement and Payment - Unless indicated otherwise in the Proposal, Glass Fiber Reinforced Liner Pipe for Sliplining shall be measured and paid for by the linear foot, complete in place.

SECTION 027202  
MANHOLES (S-62)

1. DESCRIPTION

This specification shall govern the furnishing of all materials and construction of manholes composed of a concrete based and concrete or brick masonry walls as shown on the plans to the lines, grades and dimensions shown on plans or established by Engineer.

2. MATERIALS

Concrete shall be Class "A" conforming to Section 030020 "Portland Cement Concrete". Manholes for storm sewer may be made form cast in place Class "A" Concrete, brick made from surface clay, or shale, concrete brick, precast fiberglass or a combination of these materials. Manholes for sanitary sewers shall be made from clay brick only, conforming to Grade MM of A.S.T.M. C 32. Nominal size of brick shall be 2-1/2" x 4" x 8-1/4". Brick shall be cored with 3 holes. Concrete brick shall conform to Grade A of A.S.T.M. Specification C-55.

Mortar for masonry or plastering shall be one (1) part Portland Cement to three (3) parts clean hard and sharp mortar sand, free of all foreign substances or injurious alkalies.

Reinforcing steel where used shall conform to requirements of Section 032020 "Reinforcing Steel". All manhole rings and covers for streets shall be Western Iron Works A-25 (340 lb./set) or equal and shall have the seating surface of ring and cover machined to secure a snug fit. Manholes steps shall be reinforced polypropylene plastic steps, as manufactured by Improved Construction Methods, Jacksonville, Arkansas or approved equal. If concrete precast storm sewer manholes are used, these steps shall be precast into the sections. Steps are required for sanitary and storm sewer manholes.

Joint material for precast concrete manholes shall be Ram-Nek Flexible Plastic Gaskets as manufactured by K. T. Snyder Company, Houston, Texas, or an approved equal.

3. EXCAVATION

The Contractor shall do all necessary excavation for the various manholes, conforming to size and dimensions shown on plans plus a maximum of four (4) feet working room. Excavation shall not be carried to greater depth than required. Shoring shall be the responsibility of the Contractor and installed as necessary. No shoring shall be left or backfilled around until entire manhole is completed.

shall be left or backfilled around unless authorized by Engineer. Shoring shall remain in place at least twenty-four (24) hours after masonry or concrete work has been completed.

4. BRICK MANHOLES

Brick shall be laid in header courses and shall have a full bed of cement mortar. Mortar joints not to exceed one-half (1/2) inch and inside joints to be neatly struck.

Masonry shall be built upon level courses. Bats shall be used only when necessary to close joints. Brick shall be wet down immediately before being placed. The outside of manholes shall receive a coat of Cement Mortar Plaster, applied as the construction of the manhole progresses and conforming to requirements noted on details of manholes shown in the plans. The bottom of the manholes shall be carefully formed, and invert shall be smoothly finished. The bottom of the manhole shall be Class "A" Concrete and pipes shall be cut to fit inside surface of walls.

The outside area of sanitary sewer manholes in the Flour Bluff Area, Corpus Christi Beach Area or any area where natural ground elevations are below elevation of 12.OMSL, shall be coated below six foot of depth as follows. The outside of the manholes shall receive a coat of mortar prepared as follows: 1 part Portland Cement and 2 parts clean sand shall be gauged with a solution of 1 part (Anti-Hydro or equivalent) and 10 parts water. Scratch and finish coat shall be applied 5/8" total thickness to all manholes. To assure perfect bond to all abutting masonry or hard concrete, all surfaces shall be thoroughly rough, clean and dampened with clean water. Apply a slush coat of fresh Portland Cement gradually stirred into a solution of 1 part Anti-Hydro and 3 parts water to a consistency of heavy paint. While slush coat is still wet, apply the Anti-Hydro Portland cement mortar. The outside area above six feet of depth shall receive the standard cement mortar plaster.

#### 5. CONCRETE MANHOLES (STORM SEWER ONLY)

##### (1) Formed in Placed Manholes:

Where formed concrete is used, forms shall be built to dimensions shown on standard details. Inserts and openings shall be formed so concrete will not be injured during process of stripping forms. Forms shall be braced and tied to prevent spreading or bulging, and meet approval of Engineer prior to placing concrete. Forms shall remain in place for minimum of twenty-four (24) hours, and shall be removed within a maximum time of seven (7) days after completion of concrete work. Reinforcing steel, if required, shall be as shown on plans.

The bottom of manholes shall be carefully formed and inverted smoothly when finished, with pipes cut to fit inside surface of walls.

##### (2) Precast Manholes

Precast manholes shall allow unobstructed view of all pipes connected to the manhole. Precast manholes shall be designed to support HS-20 loading and designed by an Engineer. The upper 18" of the corbel shall be brick to facilitate subsequent grade adjustment. Either concentric or eccentric cones may be required. Where not specified, the eccentric cones will be used. Manhole designs shall be submitted for approval.

#### 6. GENERAL CONSTRUCTION METHODS

All steps and other items shall be installed as the work progresses and as shown on standard details. Work shall be completed and finished in a careful workmanlike manner, special care being given to sealing joints around all pipe extending through walls of the manholes. After finishing walls, the bottom of the manhole shall be completed by adding sufficient concrete to shape the bottom in conformity with requirements on the plans. Where old manholes are adjusted to meet new lines and grades, all old masonry or concrete shall be thoroughly cleaned and wetted before joining new masonry or concrete to it. Steps shall be grouted into place with use of epoxy grout.

#### 7. BACKFILLING/LEAKAGE TESTING

Backfilling around the manholes shall commence as soon as concrete or masonry has been allowed to cure the required time and forms and shoring have been removed. Backfill shall be placed in layers of not more than 6-inch and compacted to a minimum of 95% standard Proctor, before next layer is installed. Sanitary sewer manholes shall withstand a leakage test not to exceed a 100 gal/day loss, except that an additional 10 percent of gallonage loss will be permitted for each additional two foot head over a basic two foot internal head.

#### 8. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, Manholes shall be measured by each individual structure built, and paid for at the unit price bid per inch, of the size, type and depth specified, complete in place, and meeting the approval of the Engineer. "Complete in place" shall mean all labor, materials and equipment necessary to furnish and install the manholes. Extra depth for sanitary manholes above six feet shall be measured by the vertical foot and shall be paid for at the price bid per vertical foot for "Extra Depth for Manholes".



SECTION 027203  
 VACUUM TESTING OF SANITARY SEWER  
 MANHOLE AND STRUCTURES

1. DESCRIPTION

This specification governs all work and materials necessary to perform vacuum testing of new or existing sanitary sewer manholes. Manholes may be tested after installation with all connections (existing and/or proposed) in place. Vacuum testing may be performed prior to or after backfilling by the installer. Final acceptance in accordance with the requirements of this specification will consist of vacuum testing of the completed and installed structure (manhole) in place to include manhole/adjustment rings and manhole casting.

2. MATERIALS

Vacuum testing shall consist of a minimum of the following:

- (a) Engine
- (b) Vacuum Pump
- (c) Hose
- (d) Test Head device capable of sealing opening in manhole casting as required.
- (e) Pneumatic test plugs - these plugs shall have a sealing length equal to or greater than the diameter of the connecting pipe to be sealed.

3. PROCEDURE

- (a) The test head shall be placed at the top of the manhole in accordance with the manufacturer's recommendations.
- (b) A vacuum of 10 in. of mercury shall be drawn on the manhole, the valve on the vacuum line of the test head closed, and the vacuum pump shut off. The time shall be measured for the vacuum to drop to 9 in. of mercury.
- (c) The manhole shall pass if the time for the vacuum reading to drop from 10 in. of mercury to 9 in. of mercury meets or exceeds the values indicated in Table 1.
- (d) If the manhole fails the initial test, necessary repairs shall be made by an approved method. The manhole shall then be retested until a satisfactory test is obtained.

TABLE 1 Minimum Test Times for Various Manhole Diameters (ASTM C1244)

Depth (Ft)	Diameter, in.				
	42	48	54	60	72
Time, s					

8	17	20	23	26	33
10	21	25	29	33	41
12	25	30	35	39	49
14	30	35	41	46	57
16	34	40	46	52	67
18	38	45	52	59	73
20	42	50	53	65	81
22	46	55	64	72	89
24	51	59	64	78	97
26	55	64	75	85	105
28	59	69	81	91	113
30	68	74	87	98	121

4. TESTING AND CERTIFICATION

- (a) Testing shall be done by the Contractor and witnessed by the Engineer or his representative. All manholes and structures shall be tested as finished and completed for final acceptance.
- (b) ANY DEFECTIVE WORK OR MATERIALS shall be corrected or replaced by the Contractor and retested. This shall be repeated until all work and materials are acceptable.

5. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, Vacuum Testing of Sanitary Manholes will not be measured for pay. Such items shall be considered subsidiary to pay items applicable for Standard Sanitary Sewer Manholes and Structures complete and in place.

SECTION 027205  
FIBERGLASS MANHOLES

1. DESCRIPTION

This specification shall govern all work required for providing, installing and adjusting fiberglass manholes required to complete the project.

2. GENERAL

Fiberglass manholes shall be installed at the locations indicated in the drawings.

3. MATERIALS

A. Manholes

Fiberglass manholes shall be fabricated in accordance with ASTM-D-3753-Glass fiber reinforced polyester manholes latest edition and the referenced design criteria as follows:

1. ASTM-C-581 Practice for determining chemical resistance of thermosetting resins used in glass-fiber reinforced Structures Intended for Liquid Service
2. ASTM-D-695 Test method for compressive properties of rigid plastics
3. ASTM-D-790 Test methods for flexural properties of unreinforced and reinforced plastics and electrical insulating materials.
4. ASTM-C-923 Standard Specification for Resilient manhole connectors
5. ASTM-D-2412 Test Method for external loading properties of plastic pipe by parallel-plate loading.
6. ASTM-D-2583 Test method for indentation hardness of rigid plastics by means of a barcol impressor.
7. ASTM-D-2584 Test method for ignition loss of cured reinforced resins
8. ASTM-D-3034 Type PSM Poly (Vinyl) Chloride) (PVC) sewer pipe and fittings
9. ASTM F794 PVC Profile Wall Sewer Pipe (riser)
10. ASTM C32 Clay brick, grade MM (riser) 2 1/2" x 4" x 8 1/4"

The minimum wall thickness for all fiberglass manholes at all depths shall be 0.50". The inside diameter of the manhole barrel shall be either 48" or 1.5 times the nominal pipe diameter of the largest pipe, which ever is larger. A concentric reducer over the barrel shall have a minimum inside diameter of 22 inches at the top.

B. Manhole Pipe Connectors

Manhole pipe connectors for Sanitary Sewer Application shall be made of corrosion resistant plastic. The connector shall eliminate leaks around the pipe entering the manhole wall and shall permit pipe movement without loss of seal integrity and be in conformance with ASTM D-3212. Material for elastomeric seal in push-on joints shall meet the requirements of ASTM F-477. Material for rubber sleeve shall meet the requirements of ASTM C-443. Manhole pipe connectors between 4" and 15", shall be Inserta Tee of Fowler Mfg. or approved equal.

Manhole pipe connection for Storm Sewer Application shall be made with Ram-Nek flexible plastic gasket material as manufactured by K.T. Snyder

Company of Houston or approved equal and wrapped with Class A Subsurface Drainage Geotextile, AASHTO M288.

C. Manhole Base

Concrete shall be Class A in accordance with Section 030020.

Caulk for seal between fiberglass manhole and concrete cast-in-place base shall be Epo-Flex epoxy (gun grade consistency) as manufactured by Dewey Supply of Corpus Christi, or approved equal.

Precast Reinforced Concrete Manhole Base shall be in accordance with requirements of ASTM C-478 as shown on construction plans and detail drawings.

D. Inflow Inhibitors

Inflow inhibitors shall be installed in sanitary manholes. They shall be of 316 stainless steel with an equivalent thickness of not less than 18 gauge and load tested in excess of 3000 pounds. The inhibitor shall rest on the lip of the seating surface of the manhole ring and shall not exceed a depth of 6.5 inches. The seating surface of the inhibitor shall have an attached gasket on the weight bearing side. The inhibitor shall have a gas relief valve made of Nitrite and shall operate at a 1 psi differential pressure. The inhibitor shall be fitted with a handle of 3/16 plastic coated stainless steel cable attached to the insert body with a 6# 316 stainless steel rivet. The inhibitor shall be constructed of materials that withstand highly corrosive sewer gases. Inhibitor shall be stamped [Property of City of Corpus Christi, Texas].

E. Ring & Cover

Manhole ring & cover for a 4-foot diameter manhole shall be for street application and be Western Iron Works (340 lb./set) or approved equal. Manholes 5-feet in diameter and larger shall require a nominal 3-foot ring and cover as specified on the drawings.

4. CONSTRUCTION METHODS

**General:** The limit of excavation shall allow for placing and removing forms, installing sheeting, shoring, bracing, etc. The Contractor shall pile excavated material in a manner that will not endanger the work and will avoid obstructing sidewalks, driveways, power pole, drainage, streets, etc.

**Vertical Side:** When necessary to protect other improvements, the Contractor shall maintain vertical sides of the excavation. The limit shall not exceed three feet outside the footing on a vertical plan parallel to the footing except where specifically approved otherwise by the Engineer. The Contractor shall provide and install any sheeting, shoring, and bracing as necessary to provide a safe work area as required to protect workmen, structures, equipment, power poles, etc. The Contractor shall be responsible for the design and adequacy of all sheeting, shoring and bracing. The sheeting, shoring, and bracing shall be removed, as the excavation is backfilled.

**Sloping Sides:** In unimproved areas, where sufficient space is available, the Contractor shall be allowed to back slope the sides of the excavation. The back slope shall be such that the excavation shall be safe from caving. Safety requirements shall govern the back slope used.

**De-watering:** The Contractor shall keep the excavation free from water by use of cofferdams, bailing, pumping well pointing, or any combination as the particular situation may warrant. All de-watering devices shall be installed in such a manner as to provide clearance for construction, removal of forms, and inspection of exterior of form work. It is the intent of these specifications that the foundation be placed on a firm dry bed. The foundation bed shall be kept in a de-watered condition for a sufficient period of time to insure the safety of the structure, but in no case shall de-watering be terminated sooner than seven (7) days after placing concrete. All de-watering methods and procedures are subject to the approval of the Engineer. The excavation shall be inspected and approved by the Engineer before work on the structure is started. The Contractor shall provide a relatively smooth, firm foundation bed for footings and slabs that bear directly on the undisturbed earth without additional cost to the City, regardless of the soil conditions encountered. The Engineer will be the sole judge as to whether these conditions have been met. The Contractor shall pile excavated material in a manner that will not create an unsafe condition.

**Unauthorized Over Excavation:** Excavation for slabs, footings, etc., that rest on earth, shall not be carried below the elevation shown on the drawings. In the event the excavation is carried on below the indicated elevation, the Contractor shall bring the slab, footing, etc., to the required grade by filling with concrete.

**Wall Preparation for Pipe Penetrations:** For sanitary sewer application, pipe penetrations for pipe 4" through 15" shall be made with appropriately sized core drill bits recommended by the Manufacturer. Pipe penetrations other than described above and as authorized by the Engineer shall be made as follows: cut shall be equal to the outside diameter of pipe to pass through it, plus  $\frac{1}{8}$  inch. Cuts are to be made using electric or gasoline powered circular saw with masonry blade. Impact type tools shall not be used.

**Handling:** Manholes shall be handled and stored in a safe manner as necessary to prevent damaging either the manhole or the surroundings. If manhole must be moved by rolling, the ground which it transverses shall be smooth and free of rocks, debris, etc. Manholes shall be lifted as specified by the manufacturer.

**Height Adjustment:** If necessary, position bricks, or blocks, in the excavation to adjust the manhole to correct elevation.

**Installation:** Lower manhole into wet concrete until it rests at the proper elevation, and minimum of six (6) inches into concrete, then plumb.

**Backfill Material:** Unless shown otherwise on the drawings, select material shall be used for backfill around the manhole for a distance of two feet from the outside surface and extending from the bottom of the excavation to the bottom of the top slab. Suitable material chosen from the excavation may be used for the remainder of the backfill. The material chosen shall be free of large lumps or clods, which will not readily break down under compaction. This material will be subject to approval by the Engineer. Backfill material shall be free of vegetation or other extraneous material. Excavated material which are to be used for fill or backfill may be stockpiled on the site. Location of stockpiles shall be approved by the Engineer. Topsoil should be stockpiled separately and used for finish grading around the structure, if necessary.

When indicated on the plans or under pavements, the area around the manhole shall be backfilled to the road base with "Hasty Backfill" cement-stabilized sand containing a minimum of 1.5 sacks of standard Type I Portland cement per cubic yard of sand.

**Schedule of Backfilling:** The Contractor may begin backfilling of manhole as soon as the concrete has been allowed to cure and the forms removed.

**Compaction:** Backfill shall be placed in layers not to exceed 6" compacted thickness and mechanically tamped to at least 95% Standard Proctor Density. Backfill shall be placed in such a manner as to prevent any wedging action against the structure.

## 5. TESTING

Manholes will be tested for leakage by either of two tests as specified by Engineer.

Water Leakage Test:

The contractor shall provide water, labor, and materials for testing.

Testing will be as follows:

1. With sewers plugged, the manhole shall be filled with water.
2. The manhole shall be checked after 24 hours have elapsed.
3. Water loss shall not exceed 2.4 gallons per foot of depth for the 24-hour period.
4. If the manhole is within 9 feet of a waterline that is not or cannot be encased, the manhole shall be tested for no leaks and no noticeable loss of water shall be experienced for the 24-hour period.

If water loss is excessive, the Contractor shall correct the problem and the manhole shall be retested.

Vacuum Test:

Vacuum testing shall be in accordance with Section 027203, Vacuum Testing of sanitary sewer manholes and structures.

## 6. GRADE ADJUSTMENT OF EXISTING FIBERGLASS MANHOLES

The adjustment of the ring and cover is to be achieved by removal or addition of [grade adjustment bricks or plastic, HDPE, grade adjustment rings] that rest above the fiberglass corbel. If the ring and cover must be lowered to the extent that the new elevation cannot be achieved by removal of bricks and it is necessary to remove a section of the fiberglass manhole, this work shall be done as described below.

Note that manhole repair kits are available for this work.

Remove the appropriately sized section of the existing manhole from the vertical manhole wall at least 6" below the seam where the corbel meets the vertical wall.

Excavate evenly around the manhole as required.

Mark, cut and remove the required section of the manhole. Make a square cut as necessary for a good butt splice.

Grind and clean ends of fiberglass that are to be re-united.

Replace and align the top. Fiberglass a 6" strip along the outside seam all

around with two layers of mat with one layer of roven woven sandwiched between.

After the outside has set, go on the inside and fill any voids in the seam with epoxy or material provided by a manhole manufacturer for use in such application.

After the putty has set. Fiberglass a 6" strip on the inside as previously done on the outside.

After curing, backfill with select material compacted to a minimum of 95% standard proctor or as directed by the Engineer.

7. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, Fiberglass Manholes shall be measured per each. Measurement shall include, but not be limited to; excavation, concrete foundation, manhole assembly, connections, cast iron frame and cover, concrete work, backfill, testing, and other work as required to complete the fiberglass manhole. Payment shall be made at the unit price bid and shall fully compensate the Contractor for all materials, labor, tools equipment, and other incidentals required to complete the work.

Extra depth for a sanitary manhole over 6 feet in depth will be measured by the vertical foot of depth in excess of 6 feet and bid as [Extra Depth for Manholes] (sanitary).

SECTION 027207  
REHABILITATION OF MANHOLES AND WET WELLS  
WITH SHOTCRETE AND WATERPROOFING (S-74)

1. SCOPE - SHOTCRETING

The work covered by these specifications consists of furnishing all labor, equipment, materials, and performing all operations in connection with the rehabilitation of manholes with shotcrete and waterproofing, complete in strict accordance with these specifications and the applicable drawings and subject to the terms and conditions of the contract.

1.1 Shotcrete:

1.1.1 Shotcreting shall conform to all requirements of "Specifications for Materials, Proportioning, and Application of Shotcrete (ACI-506.2-77)" published by the American Concrete Institute, Detroit, Michigan, except as modified by these specifications.

1.1.2 Steel reinforcement shall be incorporated in the shotcrete as required and shall be furnished, bent, set and placed in accordance with the provisions of these specifications.

1.1.3 The purpose of this specification is to obtain a dense and durable concrete having the specified strength.

1.2 Composition:

1.2.1 Shotcrete shall be composed of Portland Cement, aggregate and water so proportioned as to produce a concrete suitable for pneumatic application.

1.3 Strength Requirements:

1.3.1 Concrete ingredients shall be selected, proportioned in such a manner as will produce concrete which will be extremely strong, dense and resistant to weathering and abrasion. Concrete shall have a minimum 28-day strength of 4,000 psi.

1.4 Materials:

1.4.1 Portland Cement

1.4.1.1 Cement shall be Portland Cement conforming to all of the requirements of the American Society for Testing Materials Standard Specifications, Latest Serial Designation C150 for Portland Cement, Type I.

1.4.1.2 When weighed in the conventional manner, Portland Cement shall weigh not less than 94 pounds per cubic foot.

1.4.2 Fine Aggregate

1.4.2.1 Fine aggregate shall be natural siliceous sand consisting of hard, clean, strong, durable and uncoated particles, conforming to the requirements of American Society for Testing Materials Standard Specifications, Latest Serial Designation C33 for Concrete Aggregates.



1.4.2.2 Fine aggregate shall not contain less than 3% nor more than 6% of moisture.

1.4.2.3 Fine aggregate shall be evenly graded from fine to coarse and shall be within the following limits:

Passing No.	3/8 sieve	- 100%
Passing No.	4 sieve	- 95% to 100%
Passing No.	8 sieve	- 80% to 100%
Passing No.	16 sieve	- 50% to 85%
Passing No.	30 sieve	- 25% to 60%
Passing No.	50 sieve	- 10% to 30%
Passing No.	100 sieve	- 2% to 10%

#### 1.4.3 Water

1.4.3.1 Water used in mixing at the nozzle shall be fresh, clean, and free from injurious amounts of oil, acid, alkali, vegetable, sewage and/or organic matter. Water shall be considered as weighing 8.33 pounds per gallon.

#### 1.4.4 Reinforcement

1.4.4.1 Reinforcement bars shall conform to the latest requirements of ASTM Standard Specifications, Serial Designation A 615 for Deformed Billet Steel Bars for Concrete

Reinforcement. Unless shown otherwise on the plans, all bars shall be Grade 40.

1.4.4.2 Steel mesh reinforcement shall be electrically welded, cold drawn, mild steel fabric conforming to the latest requirements of ASTM Standard Specifications, Serial Designation A 185 for Welded Steel Wire Fabric for Concrete Reinforcement. Mesh can be fabricated from cold-drawn steel wire conforming to the requirements of the latest ASTM Standard Specifications, Serial Designation A 82. Unless otherwise shown on the plans, mesh shall be 2 x 2 - WO.9 x WO.9 galvanized welded wire fabric.

#### 1.4.5 Storage of Materials

1.4.5.1 Cement shall be stored with adequate provisions for the prevention of absorption of moisture. It shall be stored in a manner that will permit easy access for inspection and identification of each shipment.

1.4.5.2 Aggregate shall be stockpiled at points selected to provide maximum drainage and to prevent the inclusion of any foreign material during rehandling.

1.4.5.3 On delivery to the site of the work, the steel reinforcement shall be carefully bundled, tagged and stored so the bars for any position in the work may be readily identified. All reinforcing steel shall be stored on approved material above the ground.

### 1.5 Sampling and Testing Cement and Aggregate

1.5.1 The Contractor shall determine the source, kind and quality of the cement and aggregates to be used in the work well in advance of the time scheduled for starting the work and, when so directed, shall submit such information for approval before starting shotcrete operations.

1.5.2 The cost of testing cement and aggregates shall be borne by the City. Certified test reports and certificates, when so directed, shall be submitted in duplicate to the Engineer and to such other agencies or persons as he may designate.

1.5.3 Where cement and aggregate suppliers maintain regular recognized testing services, certified copies of such tests shall be submitted to the Engineer. However, in any case of doubt as to the accuracy and/or adequacy of such tests, the Owner may require that cement and aggregates be tested by a recognized commercial testing laboratory which has been selected by the Contractor and approved by the Owner. The testing laboratory shall then test the cement and aggregates and prepare written reports showing the results of such tests on each shipment. The laboratory shall also certify that the materials covered by the report comply in all respects with these specifications.

1.5.4 No cement or aggregate which fails to meet the requirements of these specifications shall be incorporated into the work.

## 1.6 Surface Preparation

1.6.1 Unsound materials of construction and all coated, scaly, or unsound material shall be removed by chipping with pneumatic hammers and chisels to sound surface; all cracks and cavities shall be chipped to such formation that their sides form approximately a 45-degree angle to the exposed surface for at least one (1) inch in depth. All areas to receive pneumatic concrete shall be cleaned by flushing or scouring with water and compressed air jets to assure removal of all loose particles. All areas of existing surfaces shall be given a wet sandblasting with the shotcrete equipment and the air pressure at the cement gun shall not be less than 50 psi or hydroblast @ min. 6000 psi.

A caustic wash comprised of sodium hydroxide solution at a ratio of one quart of 50% Sodium Hydroxide Solution to 100 gallons of water shall be applied to all surfaces. The mixing, application, and removal of the solution shall be done with caution to avoid contact with body and in a workmanlike manner. The solution shall remain on the surface for at least 15 minutes. Once the solution has been washed completely off, the surface shall be allowed to dry before application of replacement materials.

1.6.2 To insure perfect bond, the newly chipped, sandblasted, and washed surface shall be thoroughly moistened with water prior to application of shotcrete. In no instance shall shotcrete be applied in an area where free running water exists.

## 1.7 Proportioning

1.7.1 Prior to start of shotcreting, the Contractor shall submit to the Engineer the recommended mix as a ratio of cement to aggregate. Recommended mix shall be on the basis of test data from prior experience and capable of producing the required 4,000 psi compressive strength. Provided data submitted is adequate, no further testing of recommended mix will be required.

1.7.2 The Contractor shall provide all equipment necessary to control the actual amounts of all materials entering into the concrete. The types of equipment and methods used for measuring materials shall be subject to approval.

## 1.8 Mixing

1.8.1 Shotcrete shall be thoroughly mixed by machine and then passed through a sieve to remove all large particles before placing in hopper of the cement gun. The mixture shall not be permitted to become damp. Each batch should be entirely discharged before recharging is begun. The mixer shall be cleaned thoroughly enough to remove all adherent materials from the mixing vanes and from the drum at regular intervals.

1.8.2 Water shall not be added to the mix before it enters the cement gun. Quantities of water shall be controlled by a valve at the nozzle of the gun. Water content shall be adjusted as required for proper placement, but shall in no case exceed four gallons of water per sack of cement, including the water contained in the aggregate.

1.8.3 Remixing or tempering shall not be permitted. Mixed material that has stood 45 minutes without being used shall be discarded. Rebound materials shall not be reused.

## 1.9 Application

1.9.1 Shotcrete shall not be placed on a frozen surface nor during freezing weather. Shotcrete shall not be placed when it is anticipated that the temperature during the following 24 hours will drop below 32 degrees Fahrenheit.

1.9.2 Sequence of application may be from bottom to top or vice versa if rebound is properly removed.

1.9.3 Corners shall be filled first. "Shooting" shall be from an angle as near perpendicular to the surface as practicable, with the nozzle held approximately 3 feet from the work (except in confined control). If the flow of material at the nozzle is not uniform and slugs, sand spots, or wet sloughs result, the nozzleman shall direct the nozzle away from the work until the faulty conditions are corrected. Such defects shall be replaced as the work progresses.

1.9.4 Shotcreting shall be suspended if:

- (1) Air velocity separates the cement from the sand at the nozzle.
- (2) Temperature approaches freezing and the newly placed shotcrete cannot be protected.

1.9.5 Shotcrete shall be applied in one or more layers to such total thickness as required to restore the area as detailed over the original lines of the adjoining surface, unless otherwise specified. All cavities, depressions, washouts, and similar failures shall be rebuilt to original lines by use of shotcrete reinforced with wire mesh; where the cavity exceeds 4 inches in depth, a layer of mesh shall be used for each 3 inches of depth of shotcrete. However, in no case shall wire mesh be placed behind existing reinforcement.

1.9.6 The time interval between successive layers in sloping, vertical or overhanging work must be sufficient to allow initial but not final set to develop. At the time the initial set is developing, the surface shall be cleaned to remove the thin film of laitance in order to provide a perfect bond with succeeding applications.

## 1.10 Construction Joints

1.10.1 Construction joints or day's work joints shall be sloped off to a thin, clean, regular edge, preferably at a 45-degree slope. Before placing the adjoining work, the slope portion and adjacent shotcrete shall be thoroughly cleaned as necessary, then moistened and scoured with an air jet.

#### 1.11 Surface Finish

1.11.1 Nozzleman shall bring the shotcrete to an even plane and to well-formed corners by working up to ground wires or other guides, using somewhat lower placing velocity than normal.

1.11.2 After the body coat has been placed, the surface shall be trued with a thin-edge screed to remove high areas and expose low areas. Low areas shall be properly filled with concrete to insure a true, flat surface.

1.11.3 After the concrete surface has been trued, the entire surface shall be given a flashcoat finish unless a special type finish is specified on the drawings.

1.11.4 Thicknesses: The minimum thickness of the shotcrete shall be 1-inch over all surfaces.

#### 1.12 Curing

1.12.1 Curing shall be in accordance with either paragraph 3.7.1(d) or paragraph 3.7.5 of ACI 506.2-77 depending upon atmospheric condition.

#### 1.13 Adjacent Surface Protection

1.13.1 During progress of the work, where appearance is important, adjacent areas or grounds which may be permanently discolored, stained, or otherwise damaged by dust and rebound, shall be adequately protected and, if contacted, shall be cleaned by early scraping, brushing or washing as the surroundings permit.

#### 1.14 Inspection

1.14.1 Because of the importance of workmanship affecting the quality of the shotcrete, shotcrete continual inspection during placing shall be maintained. Any imperfections discovered shall be cut out and replaced with sound material.

#### 1.15 Equipment

##### 1.15.1 Cement Gun

1.15.1.1 The mixing and delivering equipment shall be either the vertical double chamber type or rotary type. The upper chamber of the double chamber type shall receive and pressurize the dry mix and deliver it to the lower chamber. The lower chamber shall force the pressurized mix into the delivery hose by means of a feed wheel. The type of feeder utilized should be of sufficient capacity that the lower chamber may continuously furnish all required material to the delivery hose while the upper chamber receives the recharge. The rotary type cement gun shall have an enlarged hopper to feed material into a rotating-multiported cylinder. Material shall fall by gravity into a port which shall then be rotated to a position in which the material is expelled by air into a moving stream of air. All equipment must be kept in good

repair. The interior of drums, feed gearing and valves shall be cleaned as often as necessary (at least once every 8-hour shift) to prevent material from caking on critical parts.

#### 15.2 Nozzle

1.15.2.1 Nozzle shall be the premixing type with perforated water feed ring inside the nozzle. The maximum length of material hose for the application of shotcrete shall be approximately 150 feet although it shall be permissible to use as much as 800 feet of material hose if the supply air pressure measured at the cement gun is increased to maintain proper velocity. The following table gives requirements for compressor size, hose size, and air pressure using 150 feet of material hose:

TABLE I

<u>Comp.Cap</u> <u>cfm</u>	<u>Max. Hose</u> <u>Dia. In.</u>	<u>Max. Size</u> <u>Nozzle In.</u>	<u>Min Air</u> <u>Press. psi</u>
365	1-5/8	1-5/8	60
600	2	2	80
750	2-1/2	1-1/2	90

For each 25 feet of material hose used in excess of 150 feet, the required air pressure shall be increased by 5 psi.

#### 1.15.3 Air Compressor

1.15.3.1 Any standard type of compressor shall be satisfactory if it is of sufficient capacity to provide, without interruption, the pressures and volume of air necessary for the longest hose delivery. The air compressor capacity determinations shall include allowances made for the air consumed in blowing rebound, cleaning, reinforcing, and for incidental uses. Compressor equipment shall be of such capacity so as to insure air pressures at the special mixer capable of producing the required material velocities.

#### 1.15.4 Water Supply

1.15.4.1 The water pressure at the discharge nozzle should be sufficiently greater than the operating air pressure to assure the water is intimately mixed with the other materials. If the line water pressure is inadequate, a water pump or pressurized tank shall be introduced into the line. The water pressure shall be uniformly steady (nonpulsating).

#### 1.16 Qualifications

##### 1.16.1 Foremen, Nozzlemen, Gunmen, Reboundmen

1.16.1.1 Before employment on the project, above workmen must satisfy the Engineer that each has done satisfactory work in similar capacities elsewhere for a sufficient period of time to be fully qualified to properly perform the work in accordance with the requirements of the related specifications.

##### 1.16.2 Foremen

1.16.2.1 Foreman shall have had at least 4 years experience on similar work.

1.16.3 Nozzlemen

1.16.3.1 Nozzlemen shall be qualified workmen, having had at least 2 years experience in similar work, and it shall be his responsibility to:

1. Insure all surfaces to be shot and clean and free of laitance or loose material, using air and air-and-water blast from the nozzle as required.
2. Insure the operating air pressure is uniform and provides proper nozzle velocity for good compaction.
3. Regulates the water content so the mix will be plastic enough to five good compaction and a low percentage of rebound but still enough not to sag.
4. Hold the nozzle at the proper distance and as nearly normal to the surface as the type work will permit, to secure maximum compaction with minimum rebound.
5. Follow a sequence routine that will fill corners with sound shotcrete and encase reinforcement without porous material behind the steel, using the maximum practicable layer thickness.
6. Determine necessary operating procedures for placement in close quarters, extended distances or around unusual obstructions where placement velocities and mix consistency must be adjusted.
7. Direct the crew when to start and stop the flow of materials, and stop the work when material is not arriving uniformly at the nozzle.
8. Insure sand or slough pockets are cut out for replacement.
9. Bring the shotcrete to finished lines in a neat and workmanlike manner.

1.16.4 Gunman

1.16.4.1 Gunman shall operate the special pneumatic mixer and direct the work of the mixer crew. Utilizing his experience, he shall maintain proper pressure on the cement gun to insure the necessary nozzle velocity. He shall further see that the material fed to the nozzle is uniform.

2. WATERPROOFING

When indicated on drawings and upon completion of the shotcreting operations, two coats of Drycon (Grey and white), as manufactured by IPA Systems of Philadelphia, PA, shall be applied to the interior surfaces of the manholes. Minimum thickness of each coat shall be 1/16 inch. Alternate waterproofing materials shall be submitted to the Engineer for approval prior to commencing manhole rehabilitation work.

3. MEASUREMENT AND PAYMENT

Unless included in the proposal as a bid item, manhole and wetwell rehabilitation shall not be measured and paid but shall be subsidiary to other work.

SECTION 027402  
REINFORCED CONCRETE PIPE CULVERTS (S-60)

1. DESCRIPTION

This specification shall govern the furnishing and placing of reinforced concrete pipe culverts and the material and incidental construction requirements for reinforced concrete pipe sewers. The culvert pipe shall be installed in accordance with the requirements of these specifications to the lines and grades shown on the plans, and shall be of the classes, sizes and dimensions shown thereon. The installation of pipe shall include all joints or connections to new or existing pipe, headwalls, etc., as may be required to complete the work.

2. MATERIALS

1. General. Except as modified herein, materials, manufacture and design of pipe shall conform to ASTM Designation: C-76 for Circular Pipe; ASTM Designation: C-506 for Arch Pipe, or ASTM Designation: C-507 for Elliptical Pipe. All pipe shall be machine made or cast by a process which will provide for uniform placement of the concrete in the form and compaction by mechanical devices which will assure a dense concrete. Concrete shall be mixed in a central batch plant or other approved batching facility from which the quality and uniformity of the concrete can be assured. Transit mixed concrete will not be acceptable for use in precast concrete pipe.

2. Design. All pipe shall be Class III (Wall "B") unless otherwise specified on the plans. The shell thickness, the amount of circumferential reinforcement and the strength of the pipe shall conform to the specified Class as summarized in ASTM Designation: C-76 for Circular Pipe; C-506 for Arch Pipe; C-507 for Elliptical pipe.

3. Physical Test Requirements. The acceptability of the pipe shall be determined by the results of the three-edge-bearing test for the load to produce the 0.01 inch crack and the ultimate load; by the appropriate material tests required in ASTM Designations: C-76, C-506 or C-507 by absorption tests on selected samples from the wall of the pipe; and by inspection of the finished pipe to determine its conformance with the design prescribed in these specifications and its freedom from defects. Three-edge-bearing tests for both the 0.01-inch crack and the ultimate load shall be performed on one pipe for each 100 pipe, or fraction thereof, for each type, size and class. The methods of testing shall conform to ASTM Designations: C-76, C-506 or C-507, whichever is applicable.

As an alternate to the three-edge-bearing test, concrete pipe 60 inches in diameter and over may be accepted, at the option of the manufacturer, on the basis of material tests and inspection of the completed product. Acceptability of pipe on this basis shall be determined by the results of material tests as required in ASTM Designation: C-76, C-506 or C-507; by crushing tests on cores taken from the barrel of the completed and cured pipe; by absorption tests on samples from the wall of the pipe; and by inspection of the finished pipe including amount and placement of reinforcement, to determine its conformance with the design prescribed in these specifications and its freedom from defects. The manufacturer shall furnish facilities and personnel for taking the cores from the pipe barrel and for determining the compressive strength of the samples. When the cores cut from a section of pipe successfully meet the strength requirement, the core holes shall be plugged and sealed by the

manufacturer in a manner such that the pipe section will meet all test requirements of ASTM Designation: C-76 or C-506. Pipe sections, so sealed, will be accepted for use.

4. Sizes and Permissible Variations

- a. Variations in diameter, size, shape, wall thickness, reinforcement, placement of reinforcement, laying length and the permissible underrun of length shall be in accordance with the applicable ASTM Specification for each type of pipe as referred to previously.
- b. Where rubber gasket pipe joints are to be used, the design of the Joints and Permissible Variations in Dimensions shall be in accordance with ASTM Designation: C-443.

5. Workmanship and Finish. Pipe shall be substantially free from fractures, large or deep cracks and surface roughness. The ends of the pipe shall be normal to the walls and centerline of the pipe within the limits of variations allowed under the applicable ASTM specification.

6. Curing. Pipe shall be cured in accordance with the applicable ASTM Specification for each type of pipe as referred to above.

7. Marking. The following information shall be clearly marked on each section of pipe:

- a. The class of pipe.
- b. The date of manufacture.
- c. The name of trade mark of the manufacturer.
- d. One end of each section of pipe with elliptical reinforcement shall be clearly marked during the process of manufacture or immediately thereafter on the inside and the outside of opposite walls to show the location of the "top" or "bottom" of the pipe as it should be installed, unless the external shape of the pipe is such that the correct position of the top and bottom is obvious. Marking shall be indented on the pipe section or painted thereon with waterproof paint.

8. Minimum Age for Shipment. Pipe shall be considered ready for shipment when it conforms to the requirements of the tests specified herein.

9. Inspection. The quality of materials, the process of manufacture, and the finished pipe shall be subject to inspection and approval by the Engineer at the pipe manufacturing plant. In addition, the finished pipe shall be subject to further inspection by the Engineer at the project site prior to and during installation.

10. Causes for Rejection. Pipe shall be subject to rejection on account of failure to conform to any of the specification requirements. Individual sections of pipe may be rejected because of any of the following:

- a. Fractures or cracks passing through the shell, except for a single end crack that does not exceed the depth of the joint.



- b. Defects that indicate imperfect proportioning, mixing and molding.
- c. Surface defects indicating honeycombed or open texture.
- d. Damaged ends, where such damage would prevent making a satisfactory joint.

11. Repairs. Pipe may be repaired if necessary, because of occasional imperfections in manufacture or accidental injury during the handling and will be acceptable if, in the opinion of the Engineer, the repairs are sound and properly finished and cured and the repaired pipe conforms to the requirements of the specifications.

12. Rejections. All rejected pipes shall be plainly marked by the Engineer and shall be replaced by the Contractor with pipe that meets the requirements of these specifications. Such rejected pipe shall be removed immediately from the worksite.

13. Jointing Materials. Unless otherwise specified on the plans, the Contractor shall have the option of making the joints by any of the following methods:

- a. Ram-Nek, a pre-formed plastic base joint material manufactured by K. T. Knyder Company, Houston, Texas, or an approved equal. Use of Talcote as Joint Material not permitted. Ram-Nek joint material and primer shall be supplied for use on pipe in the following sizes, which is the minimum that will be required. Additional Ram-Nek may be required if, in the opinion of the Engineer, a proper joint is not secured, and additional Ram-Nek shall be required for non-circular concrete pipe as required by the Engineer.

<u>Pipe Size</u>	<u>Primer Per 100 Jts.</u>	<u>Cut Lengths Per Joint</u>
12"	1.5 gals.	10 pcs 1" x 2'5"
15"	1.9 gals.	2 pcs 1" x 2'5"
18"	2.7 gals.	10 pcs 10" x 3'5"
21"	3.8 gals.	2 pcs 10" x 3'5"
24"	6.2 gals.	2 pcs 10" x 3'5"
30"	8.5 gals.	20 pcs 10" x 3'5"
36"	9.5 gals.	3 pcs 1-3/4" x 3'5"
42"	12.0 gals.	30 pcs 1-3/4" x 3'5"
48"	15.0 gals.	4 pcs 1-3/4" x 3'5"
54"	20.0 gals.	40 pcs 1-3/4" x 3'5"
60"	25.0 gals.	5 pcs. 1-3/4 x 3'5"
66"	30.0 gals.	50 pcs 1-3/4" x 3'5"
72"	32.0 gals.	6 pcs 2" x 3'5"

- b. TYLOX types "C", "C-P", or "CR", rubber gaskets, as applicable, as manufactured by Hamilton Kent Manufacturing Company, Kent, Ohio, or approved equal. All gaskets, lubricants, adhesives, etc., shall be manufactured, constructed, installed, etc., as recommended by the manufacturer of the rubber gasket material and conform to ASTM Designation C-443. In addition, the contractor shall furnish the City, for approval, manufacturer's brochures detailing the complete use, installation, and specifications of concrete pipe and rubber gaskets before any rubber gasket material is used on the project. All rubber gaskets shall be fabricated from synthetic rubber.

NOTE: Cement Mortar is prohibited from jointing pipe except at manholes, pipe junction, etc., or where specifically approved by the Engineer.

- c. Geotextile for wrapping joints shall be Class 1 geotextile for subsurface drainage with an average opening size, AOS, of .22 mm. and in accordance AASHTO M288.

### 3. CONSTRUCTION METHODS

Reinforced concrete pipe culverts shall be constructed from the specified materials in accordance with the following methods and procedures:

1. Excavation. All excavation shall be in accordance with the requirements of the specifications Section 022020 "Excavation and Backfill for Utilities and Sewers", except where tunneling or jacking methods are shown on the plans or permitted by the Engineer. When pipe is laid in a trench, the trench when completed and shaped to receive the pipe shall be of sufficient width to provide free working space for satisfactory bedding and jointing and thorough tamping of the backfill and bedding material under and around the pipe. The Contractor shall make such temporary provisions as may be necessary to insure adequate drainage of the trench and bedding during the construction operation.

2. Bedding. The pipe shall be bedded in accordance with the bedding details shown on the drawings. Bedding shall not be measured for pay, but shall be subsidiary to other work.

The type of bedding required shall depend on the depth of the pipe and the condition of the trench subgrade. The maximum allowable depth of pipe (the distance between the invert of the pipe and finished grade) is provided in the "RCP Bedding Table" as follows:

#### RCP Bedding Table

Pipe Size Nominal (Inches)	Maximum Allowable Depth (Feet)	
	Class "C" Bedding	Class "B" Bedding
15-18	8	11
21-33	9	12
36	10	13
42	11	14
48	12	15
54	13	16
60	14	17
66	15	17
72	16	18

Note:

1. Depth, from invert to finish grade
2. Soil, clay @ 130 lb./ft.<sup>3</sup>
3. Suitable for trench width > transition width
4. Safety factor = 1 @ D.01" crack, 1.5 @ ultimate

The pipe shall be laid and bedded such that the maximum depth is not exceeded. Generally, Class "C" bedding shall be adequate for most conditions. However, if the subgrade of the trench is unstable, Class "B" bedding, shall be required, even if this condition occurs at relatively shallow depths. If unstable conditions persist, full encasement of the pipe with crushed stone (well graded 3/4" to 1/4") shall be required. Crushed Stone Encasement shall extend from the top of pipe to 6" below the pipe or to stable subgrade, whichever is deeper. If it is necessary to install pipe at depths in excess of those allowable for Class "B" bedding the trench width shall be reduced or complete encasement with crushed stone shall be required as directed by the Engineer.

3. Laying Pipe. Unless otherwise authorized by the Engineer, the laying of pipe on the prepared foundation shall be started at the outlet end with the spigot or tongue end pointing downstream and shall proceed upstream with the abutting sections properly matched, true to the established lines and grades. Where bell and spigot pipe are used, cross trenches shall be cut in the foundation to allow the barrel of the pipe to rest firmly upon the prepared bed. These cross trenches shall be not more than two inches larger than the bell ends of the pipe. Proper facilities shall be provided for hoisting and lowering the sections of pipe into the trench without disturbing the prepared foundation and the sides of the trench. The ends of the pipe shall be carefully cleaned before the pipe is placed. As each length of pipe is laid, the mouth of the pipe shall be protected to prevent the entrance of earth or bedding material. The pipe shall be fitted and matched so that when laid in the bed, it shall form a smooth, uniform conduit. When elliptical pipe with circular reinforcing or circular pipe with elliptical reinforcing is used, the pipe shall be laid in the trench in such position that the markings "Top" or "Bottom", shall not be more than 5 degrees from the vertical plane through the

longitudinal axis of the pipe.

For the pipe over 42 inches in diameter, the Contractor may drill two holes not larger than 2 inches in diameter, in the top of each section of the pipe, to aid in lifting and placing.

The holes shall be neatly drilled, without spalling of the concrete, and shall be done without the cutting of any reinforcement. After the pipe is laid, the holes shall be filled with mortar and cured.

Multiple installations of reinforced concrete pipe shall be laid with the centerlines of individual barrels parallel. When not otherwise indicated on plans, the following clear distances between outer surfaces of adjacent pipe shall be used.

Diameter of Pipe	18"	24"	30"	36"	42"	48"	54"	60" to 84"
Clear Distance Between Pipes	0'-9"	0'-11"	1'-1"	1'-3"	1'-5"	1'-7"	1'-11"	2'-0"

#### 4. Jointing.

a. If the use of Portland cement mortar joints is allowed, all pipe shall be jointed tight and sealed with stiff mortar, composed of one part Portland cement and two parts sand, so placed as to form a durable water-tight joint. The installation shall be as required by the Engineer.

b. Joints using Rubber Gaskets: Where rubber gasket pipe joints are required by the plans, the joint assembly shall be made according to the recommendations of the gasket manufacturer. Watertight joints will be required when using rubber gaskets.

c. Joints using Cold Applied Preformed Plastic Gaskets shall be made as follows:

A suitable primer to the type recommended by the manufacturer of the gasket joint sealer shall be brush applied to the tongue and groove joint surfaces and the end surfaces and allowed to dry and harden. No primer shall be applied over mud, sand or dirt or sharp cement protrusions. The surface to be primed must be clean and dry when primer is applied.

Before laying the pipe in the trench, the plastic gasket sealer shall be attached around the tapered tongue or tapered groove near the shoulder or hub of each pipe joint. The paper wrapper shall be removed from one side only of the two-piece wrapper on the gasket and pressed firmly to the clean, dry pipe joint surface. The outside wrapper shall not be removed until immediately before pushing the pipe into its final position.

When the tongue is correctly aligned with the flare of the groove, the outside wrapper on the gasket shall be removed and the pipe shall be pulled or pushed home with sufficient force and power (Back Hoe shovel, chain hoist, ratchet hoist or winch) to cause the evidence of squeeze-out of the gasket material on

the inside or outside around the complete pipe joint circumference. Any joint material pushed out into the interior of the pipe that would tend to obstruct the flow shall be removed. (Pipe shall be pulled home in a straight line with all parts of the pipe on line and grade at all times.) Backfilling of pipe laid with plastic gasket joints may proceed as soon as the joint has been inspected and approved by the Engineer. Special precautions shall be taken in placing and compacting backfill to avoid damage to the joints.

When the atmospheric temperature is below 60° F, plastic joint seal gaskets shall either be stored in an area warmed to above 70° F, or artificially warmed to this temperature in a manner satisfactory to the Engineer. Gaskets shall then be applied to pipe joints immediately prior to placing pipe in trench, followed by connection to previously laid pipe.

- d. Pipe Joints for storm sewers constructed in sandy soils such as the Flour Bluff, Padre Island and North Beach areas shall be wrapped Geotextile or when shown on the drawings, pipe joints shall be wrapped. The wrap shall be at least 2 feet wide and shall be centered on each joint.
5. After the pipe has been placed, bedded and jointed as specified, filling and/or backfilling shall be done in accordance with the applicable requirements of the specification "Excavation and Backfill for Utilities and Sewers". When mortar joints are allowed, no fill or backfill shall be placed until the jointing material has been cured for at least six hours.

Special precautions shall be taken in placing and compacting the backfill to avoid any movement of the pipe or damage to the joints. For side drain culverts and all other culverts where joints consist of materials other than mortar, immediate backfilling will be permitted.

6. Unless otherwise shown on the plans or permitted in writing by the Engineer, no heavy earth moving equipment will be permitted to haul over the structure until a minimum of 4 feet of permanent or temporary, compacted fill has been placed thereon. Pipe damaged by the Contractor's equipment shall be removed and replaced by the Contractor at no additional cost.

#### 4. MEASUREMENT

Unless indicated otherwise in the Proposal, Reinforced Concrete Pipe will be measured by the linear foot. Such measurement will be made between the ends of the pipe barrel along its central axis. Where spurs or branches, or connections to existing pipe lines are involved, measurement of the spur or new connecting pipe will be made from the intersection of its center axis with the outside surfaces of the pipe into which it connects. Where inlets, headwalls, catch basins, manholes, junction chambers, or other structures are included in lines of pipe, that length of pipe tying into the structure wall will be included for measurement but no other portion of the structure length or width will be so included.

For multiple pipes, the measured length will be the sum of the lengths of the barrels measured as prescribed above.

#### 5. PAYMENT

Payment for concrete pipe measured as prescribed above will be made at the contract unit price bid for the various sizes of "Reinforced Concrete Pipe", "Reinforced Concrete Pipe, Arch" and "Reinforced Concrete Pipe, Elliptical" of the class specified.

Payment shall be full compensation for furnishing and transporting the pipe; hauling and placing of earth cushion material where required for bedding pipe; for the preparation and shaping of beds; for hauling, placing and jointing of pipes; for end finish; for all connections to existing structures and for all other items of materials, labor, equipment, tools, excavation, backfill and incidentals necessary to complete the culvert or storm sewer in accordance with the plans and these specifications.

SECTION 027404  
CONCRETE BOX CULVERTS (S-66)

1. DESCRIPTION

This specification shall govern all work required for constructing, furnishing, and installing R.C. Boxes required to complete the project.

The Contractor shall have the option of furnishing cast-in-place and/or precast boxes unless a specific type is called for on the plans or in the special provisions. When cast-in-place boxes are used, they shall conform to the details of the culvert designs shown in the plans. When precast boxes are used, they shall conform to AASHTO M273 (ASTM C850) for HS20 loading.

Alternate designs of precast boxes will be considered for approval upon submission of shop drawings detailing the box and certifications that the box, as designed, is structurally comparable to or better than the box shown in the contract drawings and is designed to support HS20 loading per ASSHTO M273. The shop drawings and certifications shall be signed and sealed by a Texas Registered Professional Engineer.

2. MATERIALS

1. Concrete. Unless otherwise shown on the plans, Class "A" concrete shall be used for cast-in-place and precast (formed) boxes, conforming to the requirements of Section 030020 "Portland Cement Concrete" and Section 038000 "Concrete Structures", except that Class "C" concrete will be required for direct traffic boxes, cast-in-place box.

Concrete for precast (machine-made) boxes shall meet the requirements of ASTM: C76, Sections: Cement, Aggregates and Mixture, and shall have a minimum 28 day compressive strength of 4,000 psi.

2. Reinforcement. Reinforcing steel shall conform to the requirements of Section 032020 "Reinforced Steel" and the details shown on the plans.
3. Jointing. Materials for jointing shall conform to the requirements of Section 027402 "Reinforced Concrete Pipe Culverts".
4. Membrane Curing. Materials for membrane curing shall conform to Section 038000 "Concrete Structures".
5. Geotextile for wrapping joints shall be Class 1 geotextile for subsurface drainage with an average opening size, AOS, of .22 mm. and in accordance AASHTO M288.

3. FABRICATION

The requirement of Section 030020 "Portland Cement Concrete" and Section 038000 "Concrete for Structures" shall govern for cast-in-place concrete culverts and for precast (formed) boxes except where otherwise specified herein.

Forms for precast (machine-made) boxes shall be made of steel. Forms for cast-in-place boxes and precast (formed) boxes may be either wood or steel.

Forms shall be mortar-tight and of sufficient strength to prevent excessive bulging or misalignment of adjacent boxes. They shall be constructed to permit their removal without damage to the concrete. Offsets at form joints shall not exceed one-eighth of an inch. Forms shall be clean and free of extraneous matter when concrete is placed.

Positive means of supporting steel cages in place throughout forming and concrete

placement shall be required and subject to the approval of the Engineer. Welding of reinforcing steel will be permitted only where shown on the plans. Welding shall be done by a qualified welder and shall conform to the requirements of Section 050200 "Welding".

Precast (machine-made) boxes shall be cast by a process which will provide for uniform placement of the concrete in the forms and compaction by mechanical devices which will assure dense concrete. Concrete shall be mixed in a central batch plant or other approved batching facility from which the quality and uniformity of the concrete can be assured. Transit mixed concrete shall not be acceptable for use in precast (machine-made) boxes.

#### 4. TESTING AND CERTIFICATION

1. Physical Requirements. Precast boxes shall meet the requirement of ASTM C-850. Testing shall be done by a Materials Engineering Laboratory which meets the requirements for membership in the American Council of Independent Laboratories.
2. Fabrication Tolerances. Precast boxes shall conform to the following tolerances:  
When two box sections are fitted together on a flat surface, in proper alignment and in the position they will be installed, the longitudinal opening at any point shall not exceed one inch.

Not more than four lifting holes may be provided in each box to facilitate handling. They may be cast-in, cut into the fresh concrete after form removal, or drilled, and shall not be more than 2 inches in diameter or 2 inches square. Cutting or displacement of reinforcement will not be permitted. Spalled areas around the holes shall be repaired. Concrete boxes shall be given an "Ordinary Surface Finish" in accordance with Section 038000 "Concrete Structures".

3. Certification. Certification of quality shall be provided with each delivery of materials to the job site by the manufacturer. Certification shall be a written report by the Materials Engineering Testing Laboratory.

#### 5. DEFECTS AND REPAIRS

Fine cracks or checks on the surface of the member which do not extend to the plant of the nearest reinforcement will not be cause for rejection unless they are numerous and extensive. Cracks which extend into the plant of the reinforcing steel but are acceptable otherwise, shall be repaired in an approved manner.

Small damaged or honeycombed areas which are purely surface in nature may be repaired. Excessive damage, honeycomb or cracking will be subject to structural review. Repairs shall be sound, properly finished and cured in conformance with the pertinent specifications. When fine cracks or haircracks on the surface indicate poor curing practices, further production of precast boxes shall be discontinued until corrections are made and proper curing provided.

#### 6. CONSTRUCTION METHODS

Excavation and backfill shall be in accordance with Section 022020 "Excavation and Backfill for Sewers and Utilities".

Unless otherwise shown on the plans, the Contractor may use any of the jointing materials, except rubber gaskets, and shall comply with the jointing requirements specified in the Section 027402 "Reinforced Concrete Pipe Culverts".

When indicated on the Drawings, box joints shall be wrapped with geotextile. The wrap shall be at least 2' wide, centered on joint, and geotextile shall be Class 1 geotextile for subsurface drainage with an average opening size, AOS, of .22 mm. and in accordance AASHTO M288.



Lifting holes shall be filled with mortar or concrete and cured to the satisfaction of the Engineer.

#### 7. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, Concrete Box Curverts shall be measured by the linear foot for each size of box installed. The measurement will be made between the ends of the box along the centerline. For boxes used in the multiple barrel structures, the measured length will be the sum of the lengths of all barrels.

Payment shall be made at the contract bid price and shall fully compensate the contractor for all materials required, all labor, all tools, all equipment, and all other incidentals required to complete the work as shown on the contract drawings and as specified herein.

SECTION 027406  
CORRUGATED GALVANIZED METAL PIPE (S-46)

1. DESCRIPTION

This specification shall govern furnishing corrugated metal pipe conforming to these specifications, of the sizes and dimensions required on the plans and installing such pipe as designated on the plans or by the Engineer in conformity with the lines and grades given. This specification shall include the furnishing and construction of such joints, and such connections to new or existing pipes, catch basins, endwalls, etc., as may be required to complete the work as shown on the plans. Pipe shall be full circle or pipe arch type as shown on the plans. The location of private driveway and side road pipe may be varied as deemed necessary by the Engineer.

2. MATERIALS

The zinc coated iron or steel sheets shall conform to Zinc Coated (galvanized) Iron or Steel Sheets for Culverts and Underdrains (AASHTO Designation: M218). All material shall meet the requirement of Zinc Coated (galvanized) Corrugated Iron or Steel Culverts and Underdrains (AASHTO Designation: M36) as to accepted brands, certified analysis, guarantee and rivets.

Where reference is made to "gauge" of metal, the reference is to U.S. Standard Gauge for uncoated sheets prior to galvanizing. Tables in AASHTO Designation: M 36 and M 218 list thicknesses for the coated sheets in inches.

Sampling, testing and inspection of metal sheets and coils used for Corrugated Metal pipe shall be in accordance with Test Method Tex-708-I.

Damaged spelter coating shall be repaired by thoroughly wire brushing the damaged area and removing all loose, cracked or weld-burned spelter coating. The cleaned area shall be painted with a zinc dust-zinc oxide paint conforming to Federal Specifications TT-P-641 b.

3. FABRICATION

Pipe shall be full circle or arch pipe as designated on the plans. It may be fabricated with circumferential corrugations, lap joint construction with riveted or spot welded seams, or may be fabricated with helical corrugations and a continuous lock or welded seam.

Arch pipe shall be full circle pipe which has been re-formed to multi-circle pipe having arch shaped tops with slightly outwardly centered integral bottoms.

Pipe shall conform to AASHTO Designation: M 36 as to corrugations, dimensions, riveted seams, resistance spot welded seams, end finish, size, permissible variations, workmanship and finish.

Helically corrugated pipe shall further conform to the following: Seams shall consist of a continuous lock or welded seam extending from end to end of each length of pipe section and shall be fabricated in such a manner that they will develop the full strength of the pipe and not affect the shape or nominal diameter of the pipe.

Folded lock seams or ultrahigh frequency resistance butt-welded seams shall be used. Folded lock seams shall be formed with sufficient pressure to prevent any seam slippage that would appreciably affect the load carrying capacity of the pipe but without damaging the metal to such an extent that a plane of weakness is created.

Welded seams shall be controlled so that the combined width of the weld and adjacent spelter coating burned by welding does not exceed three times the metal thickness. If the spelter coating is damaged by the welding outside the above specified area, the weld and damaged spelter adjacent to the weld shall be cleaned and painted as specified in Section 027406.2.

The manufacturer shall certify that during manufacture the weld was tested for quality and found satisfactory at the beginning of each shift, and when a change in thickness of pipe material was made. Any indication of cracks, skips or deficient welds found through normal visual inspection will be cause for rejection. A coating of rust on the bare metal portion of the weld will not be considered as a defect.

#### 4. SELECTION OF GAUGES

By entering the appropriate Tables 1, 2, 3 or 4 with the diameter, length of pipe, and maximum height of fill over pipe measure from top of pipe to finished grade elevation the required gauge may be determined. Unless otherwise noted on the plans, this gauge shall be provided for the entire culvert. Pipes designed for special purposes, under railroad tracks, or for fills in excess of the fills shown in the following table shall be of the gauge shown on the plans.

TABLE 1  
 2 2/3-inch by 1/2 -inch Corrugations  
 H-20 Loading  
 Full Circle Pipe

Pipe Diameter	Min. Cover, Top of pipe To Top of Subgrade	Maximum Fill Height Above Top of Pipe in Feet				
		0.064 In. 16 Gage	0.079 In. 14 Gage	0.109 In. 12 Gage	0.138 In. 10 Gage	0.168 In. 8 Gage
12	12	83	90	-	-	-
15	12	67	73	93	98	-
18	12	47	55	70	82	86
24	12	30	33	40	48	54
30	12	24	25	29	33	37
36	12	21	22	24	26	28
42	12	-	20	21	23	24
48	12	-	19	20	21	22
54	12	-	18	19	20	21
60	12	-	-	18	19	20
66	12	-	-	18	18	19
72	12	-	-	-	18	18
78	12	-	-	-	-	18
84	12	-	-	-	-	18

Note: Thickness in inches, as shown above, refers to the coated metal after galvanizing.

TABLE 2

3-inch by 1-inch Corrugations  
H-20 Loading Full Circle Pipe

Pipe Diameter Inches	Min. Cover, To Top of Pipe Top of Subgrade	0.064 In.	0.079 In.	0.109 In.	0.138 In.	0.168 In.	
		16 Gage	14 Gage	12 Gage	10 Gage	8 Gage	Maximum Fill Height Above Top of pipe in Feet
36	12	34	38	48	56	63	
42	12	28	30	37	42	48	
48	12	24	27	30	34	38	
54	12	22	24	26	29	32	
60	12	21	22	24	26	28	
66	12	20	20	22	23	25	
72	12	19	20	21	22	23	
78	12	18	19	20	21	22	
84	12	--	19	19	20	21	
90	12	--	18	19	19	20	
96	12	--	--	18	19	20	
102	24	--	--	18	19	19	
108	24	--	--	18	19	19	
114	24	--	--	--	18	19	
120	24	--	--	--	18	19	

Note: Thickness in inches, as shown above, refers to the Coated metal after galvanizing.

TABLE 3

2 2/3-inch by 1/2-inch Corrugations

H-20 Loading  
Pipe Arch

Design	Area		Minimum	Coated	Equivalent Diameter		
	Square Feet	*Span Inches	*Rise Inches	Gage Required	Thickness Inches	Full Circle Pipe Inches	Size
1	1.1		18	11	16	0.064	15
2	1.6		22	13	16	0.064	18
3	2.8		29	18	16	0.064	24
4	4.4		36	22	16	0.064	30
5	6.4		43	27	16	0.064	36
6	8.7		50	31	14	0.079	42
7	11.4		58	36	12	0.109	48
8	14.3		65	40	12	0.109	54
9	17.6		72	44	10	0.138	60

\*All dimensions are measured from the inside crests of the corrugations. A tolerance of plus or minus 1-inch will be permissible in span and rise.

The fill heights for all sizes of pipe arches are limited to a minimum of 12-inches and a maximum of 7 feet.

TABLE 4

3-inch by 1-inch Corrugations  
H-20 Loading

## Pipe Arch

Design Size	Area Square Feet	*Span Inches	*Rise Inches	Minimum Gage Required	Coated Thickness Inches	Equivalent Diameter Full Circle Pipe Inches
5	6.4	43	37	16	0.064	36
6	8.7	50	31	16	0.064	42
7	11.4	58	36	16	0.064	48
8	14.3	65	40	16	0.064	54
9	17.6	72	44	16	0.064	60
10	22	73	55	16	0.064	66
11	26	81	59	14	0.079	72
12	31	87	63	14	0.079	78
13	35	95	66	12	0.109	84
14	40	103	71	12	0.109	90
15	46	112	75	12	0.109	96
16	52	117	79	12	0.109	102
17	58	128	83	10	0.138	108

\*All dimensions are measured from the inside crests for the corrugations. A tolerance of plus or minus 1 inch will be permissible in span and rise.

The fill heights for all sizes of pipe arches are limited to a minimum of 12-inches and a maximum of 10 feet.

### 5. COUPLING BANDS

Coupling bands for full circle pipe and pipe arches shall be made of the same base metal as the pipe and shall be similarly zinc coated. The coupling bands shall be 16 gauge minimum for pipes through 54 inch diameter and 14 gauge minimum for pipes above 54 inch diameter.

Pipes furnished with circumferential corrugations shall be field jointed with

locking bands. The corrugated bands shall be not less than 7 inches wide for pipes through 30 inch diameter, not less than 12 inches wide for pipes through 60 inch diameter, and not less than 24 inches wide for pipes greater than 60 inch diameter.

Pipes furnished with helical corrugations shall be field jointed preferably with bands with projections. The bands for pipe diameter of 12 inches to 54 inches shall be at least 10-1/2 inches wide and for pipe diameters 60 inches and greater, 16-1/2 inches wide.

The bands shall be connected in a manner approved by the Engineer with a suitable fastening device such as galvanized 2 inch by 3/16 inch angles, or integrally or separately formed and attached flanges bolted with one-inch diameter galvanized bolts, or a wedge lock constructed of the same gauge as the band itself.

## 6. PROTECTIVE COATING

1. General. Where conditions warrant, protective coatings shall be applied to corrugated galvanized metal pipe and pipe arches. The protective coatings shall be indicated on the plans.
2. Bituminous Coated. Bituminous Coated pipe or pipe arch shall conform to this specification both as to base metal and fabrication and, in addition, shall be coated inside and out with a bituminous coating which shall meet the performance requirements set forth herein. The bituminous coating shall be 99.5 percent soluble in carbon bisulphide. The pipe shall be uniformly coated inside and out to a minimum thickness of 0.05 inch, measured on the crests of the corrugations.

The bituminous coating shall adhere to the metal tenaciously and shall not chip off in handling; and shall protect the pipe from deterioration as evidenced by samples prepared from the coating material successfully meeting the Shock Test and Flow Test in accordance with test Method Tex-522-C.

3. Paved Invert. Where a paved invert is specified, the pipe, or pipe arch, in addition to the fully coated treatment described above, shall receive additional bituminous material, of the same specification as above, applied to the bottom quarter of the circumference to form a smooth pavement with a minimum thickness of one-eighth of an inch above the crests of the corrugations.
4. Asbestos Bonded. Where asbestos bonded pipe is specified, the pipe or pipe arch shall be formed from sheets whose base metal shall conform to this specification. In addition, the sheets shall have been coated with a layer of asbestos fibers, applied in sheet form by pressing them into a molten metallic bonding medium. The pipe shall be bituminous coated inside and out as specified above. If a paved invert is specified, it shall be in accordance with the procedure outlined above. The test for spelter coating required by this specification is waived for asbestos bonded pipe.

## 7. CONSTRUCTION METHODS

Corrugated galvanized metal pipe culverts shall be constructed from the specified materials, in accordance with the following method and procedure.

1. Excavation. All excavation shall be in accordance with the requirements of the specification, Section 022020 "Structural Excavation", except where tunneling or jacking methods are shown on the plans or permitted by the Engineer. When pipes are laid in a trench, the trench when completed and



shaped to receive the pipe, shall be of sufficient width to provide free working space for satisfactory bedding and jointing and thorough tamping of the backfill and bedding material under and around the pipe. The Contractor shall make such temporary provision as may be necessary to insure adequate drainage of the trench and bedding during the construction operation.

2. Foundation. The pipe shall be bedded in a foundation of stable earth material carefully and accurately shaped to fit the lower part of the pipe exterior for at least ten percent of its overall height. When requested by the Engineer, the Contractor shall furnish a simple template for each size and shape of pipe to be placed for use in checking the shaping of bedding. The template shall consist of a thin plate or board cut to match the lower half of the cross section of the pipe.

Where the soil encountered at the established grade is a quicksand, muck or similar unstable material, unless other special construction methods are called for on the plans or in special provision, such unstable soil shall be removed and replaced in accordance with the requirement of the specification, Section 022020 "Structural Excavation".

3. Laying Pipe. Unless otherwise authorized by the Engineer, the laying of pipes on the prepared foundation shall be started at the outlet end with the separate sections firmly joined together, with outside laps of circumferential joints pointing upstream and with longitudinal laps on the sides. Any metal in joints which is not protected by galvanizing shall be coated with a suitable asphaltum paint. Proper facilities shall be provided for hoisting and lowering the sections of pipe into the trench without damaging the pipe or disturbing the prepared foundation and the sides of the trench. Any pipe which is not in alignment or which shows any undue settlement after laying, or is damaged, shall be taken up and relaid without extra compensation.

Multiple installations of corrugated galvanized steel pipe and pipe arches shall be laid with the center lines of individual barrels parallel. When not otherwise indicated on the plans, the following clear distances between outer surfaces of adjacent pipes shall be maintained:

Diameter of Pipe	Clear Distance Between Pipes Full circle and Pipe Arch	Pipe Arch Design No.
18"	1'-2"	2
24"	1'-5"	3
30"	1'-8"	4
36"	1'-11"	5
42"	2'-2"	6
48"	2'-5"	7
54"	2'10"	8
60"-84"	3'-2"	9
90"-120"	3'-5"	10 & Over

4. Connections. Where new culverts are constructed as extensions to culverts in place or are jointed to existing structures, the construction shall

include all work necessary to provide a proper connection between the new structure and the old, as indicated on the plans.

5. Backfilling. Backfilling for the metal pipe structure is a critical phase of the construction, and strict adherence to construction methods is required. After the metal pipe structure has been completely assembled on the proper line and grade and headwalls constructed when required by the plan details, selected material from excavation or borrow shall be placed along both sides of the completed structures equally, in uniform layers not exceeding 6 inches in depth (Loose measurement), wetted if required and thoroughly compacted between adjacent structures and between the structures and the sides of the trench or, for a distance each side of the structures equal to the diameter of the pipe. Backfill material shall be compacted to the same density requirements as specified for the adjoining sections of embankment in accordance with the governing specifications therefor. Above the three-fourths point of the structure, the fill shall be placed uniformly on each side of the pipe in layers not to exceed 12 inches.

For backfilling, until a minimum cover of 12 inches is obtained, only hand operated tamping equipment will be allowed within vertical planes 2 feet beyond the horizontal projection of the outside surfaces of the structure.

Unless otherwise shown on the plans or permitted in writing by the Engineer, no heavy earth moving equipment will be permitted to haul over the structure until a minimum of 4 feet of permanent or temporary, compacted fill has been placed thereon. Pipe damaged by the Contractor's equipment shall be removed and replaced by the Contractor at no additional cost.

During the backfilling operations, special emphasis is placed upon the need for obtaining uniform backfill material and uniform compacted density throughout the length of the structure so that unequal pressure will be avoided. Extreme care is to be taken to insure proper backfill under the structure.

Prior to adding each new layer of loose backfill material, until a minimum of 12 inches of cover is obtained, an inspection will be made of the inside periphery of the structure to determine any local or unequal deformation caused by improper construction methods.

## 8. MEASUREMENT

Corrugated Galvanized Metal Pipe will be measured by the linear foot. Such measurements will be made between the ends of the barrel along its central axis.

Where spurs or branches, or connections to existing pipe lines are involved, measurement of the spur or new connecting pipe will be made from the intersection of its central axis with the outside surface of the pipe into which it connects. Where inlets, headwalls, catch basins, manholes, junction chambers, or other structures are included in lines of pipe, that length of pipe tying into the structure wall will be included for measurement, but no other portion of the structure length or width will be so included.

For multiple pipes, the measured length will be the sum of the lengths of the barrels, measured as prescribed above.

In the event of a change in design which either increases or decreases the quantity of pipe, the variation in quantity will be measured as prescribed above and the quantity shown on the plans and in the proposal will be increased or decreased as the case may be.

## 9. PAYMENT

Payment for corrugated galvanized metal pipe culverts, measured as prescribed above, will be made at the contract unit price bid per linear foot for the various sizes, gauges and types of Corrugate Galvanized Metal Pipe, with or without protective coating as indicated on the plans.

Payment shall be full compensation for furnishing and transporting the pipe; for all bituminous coating, asbestos bonding and invert paving; hauling and placing of select material; the preparation and shaping of beds; hauling, placing and joining of pipes; for all connections to existing structures; and for all other items of materials, labor, equipment, tools and incidentals necessary to complete the culvert in accordance with the plans and these specifications. Where pipes are laid on a skew or where pipe ends are cut to fill slope, full compensation for cutting the ends parallel with the centerline of the roadway or the fill slope shall be considered as included in the price bid per linear foot for the designated item of pipe and no additional allowance will be made therefore.

SECTION 027414  
CULVERT REHABILITATION FLEXIBLE LINING PROCESS

1. SCOPE

This specification shall govern all work necessary to rehabilitate gravity storm sewer lines using a flexible liner process. Lining and method of installation shall be similar or equivalent to the Insituform or Inliner Lining Process where a flexible tube saturated with thermosetting resins is inserted into the line using water pressure.

2. MATERIALS

The lining material shall be a polyester fiberfelt tubing, lined on one side with polyurethane and fully impregnated with a liquid thermal setting resin. The resin shall bond to concrete. The tubing shall be properly sized for the diameter and length of sewer pipe to be lined. The proposed lining material thickness shall be as follows:

<u>Existing Sewer Line I.D. (Inches)</u>	<u>Minimum Liner Thickness (Inches)</u>
24"	.50"

The liner material shall conform to the structural standards listed below:

Tensile Strength at yield 73%	ASTM D-638 3000 psi
Flexural Strength	ASTM D-790 3000 psi
Modulus of Elasticity	ASTM D-638 300,000 psi
Flexural Modulus	ASTM D-790 300,000 psi
Impact Strength	ASTM D-256 2.5 FT-lb/In
Shear Strength	ASTM D-732 7400 psi

Prior to the use of the lining material, the contractor shall submit, for approval, satisfactory certification from an approved testing laboratory, that the material meets or exceeds the above criteria.

After placement, test for modulus of elasticity shall be conducted by an Independent Laboratory. Two field liner specimens shall be required.

In addition, satisfactory evidence shall be provided that the liner materials will withstand the corrosive effects of effluent, liquids and gases normally found in a municipal storm sewer system.

3. CONSTRUCTION METHODS

- A. **Cleaning:** All lines to be rehabilitated shall be clean and dry during the installation of the liner. The contractor shall select the method of cleaning. It is anticipated that a high velocity jet nozzle sewer cleaner will be used. However, the contractor shall utilize such other equipment as necessary to clean the line. The contractor shall take such precautions as necessary to protect the line from further damage during the cleaning process and shall be responsible for repairing any such damages. All materials resulting from the cleaning operations shall be removed at the downstream manhole of the section being cleaned.

Disposal of this material shall be as provided in the Special Provisions.

- B. Inspection: Upon completion of the cleaning operation and prior to insertion of the liner material, an inspection shall be performed. The interior of the main shall be carefully inspected to determine the location and extent of any condition which may prevent proper installation of lining materials or bonding of materials to the pipeline shall be noted so that these conditions can be corrected.
- C. Repairs: Any obstacles or conditions detrimental to liner installation shall be corrected by making an excavation at that point and effecting the necessary repairs. The method and extent of the repairs shall be approved by the Engineer.
- D. Maintain Flows: Storm water flows, that may intermittently occur, shall not be restricted during project.
- E. Liner Installation: Rehabilitation of the sewer pipe shall be accomplished by the installation of flexible liner by an inversion process wherein the flexible tube is saturated with resin turned inside out and forced in the existing line using water pressure. The contractor shall begin this phase of the work until there are sufficient materials on hand to complete the job.

The fiberfelt tube shall be vacuum impregnated with sufficient resin and catalyst system to achieve the liner thickness specified. Once impregnated, the tube shall be inserted through an existing manhole by means of an inversion process and the application of a hydrostatic head sufficient to fully extend it to the next designated access point. The hydrostatic head shall be sufficient to hold the liner tight to the existing pipe wall, produce dimples at side connections and flared ends at the entrance and exit access points.

After inversion is completed the contractor shall supply a suitable heat source and water recirculation equipment. The equipment shall be capable of delivering hot water to the far end of the pipe section through a hose, which has been perforated per manufacturer's recommendations, to uniformly raise the water temperature in the line section above the temperature to effect a cure of the resin.

The heat source shall be fitted with suitable monitor to gauge the temperature of the incoming and outgoing heat exchange circulating water. Thermocouple shall be placed between the impregnated tube and the invert at the far access point to determine the temperature and time of exotherm. Water temperature in the pipeline during the cure period shall not be less than 150 F as measured at the heat exchanger return line.

Initial cure shall be deemed to be completed when inspection of the exposed portions of the liner appear to be hard and sound and the thermocouple indicate that an exotherm has occurred. The cure period shall be of a duration recommend by the resin manufacturer modified for the lining process during which time the recirculation of the water and cycling of the heat exchanger to maintain the temperature continuously.

The contractor shall cool the finished liner to a temperature below 100 F before relieving the static head in the inversion stand pipe. Cool-

down may be accomplished by the introduction of cool water into the inversion stand pipe to replace water being drained from the downstream end. Care shall be taken in the release of the static head such that a vacuum will not be developed that could damage the newly installed liner.

- F. Branch of Service Connections: After liner has been cured, the contractor shall reconnect the existing active branch lines as designed by the Engineer. This shall generally be done without excavation and in the case of non-man entry pipes from the interior of the pipeline by means of a television camera and a cutting device that re-establishes them to not less than 90 percent capacity.
- G. Inspection of Completed Work: A final inspection will be required upon completion of rehabilitation operations. It is the intent of the plans and specifications that the entire length of the completed rehabilitation be inspected.
- H. Clean Up: After all installation work has been completed the contractor shall clean the area around the work site and return the ground cover to a like or better condition as existed prior to construction. All pavement disturbed shall be repaired as specified elsewhere in these specifications.

4. MEASUREMENT AND PAYMENT

Unless specified otherwise in the Proposal, Sanitary Sewer Rehabilitation - Flexible Lining Process shall be measured and paid by the linear foot for each size installed, complete in place.

SECTION 027602  
GRAVITY SANITARY SEWERS (S-61)

1. DESCRIPTION

This specification shall govern all work required for furnishing, handling, and installing gravity sanitary sewers required to complete the project.

2. MATERIALS

A. Pipe and Fillings:

1. VITRIFIED CLAY PIPE (VCP) and fittings shall be "Extra Strength" in accordance with ASTM C-700. Pipe shall have a minimum laying length of 6 feet, unless indicated otherwise on the plans. All joints shall be in accordance with ASTM C-425. Joints for pipe and fittings with a nominal diameter of 18 inches or less shall be Plain End (PEP); for larger sizes either PEP or Bell and Spigot.
2. POLY-VINYL CHLORIDE (PVC) PIPE and fittings shall be in accordance with ASTM D-3034. Pipe shall have an SDR of 26. Pipe and fittings shall have push-on compression gasket joints in accordance with ASTM D-3212.

B. Bedding Materials:

1. CRUSHED STONE shall be well graded angular crushed stone in the general size range of 3/4" to 1/16" which has good stability. Crushed stone shall be graded in accordance with Size #67 and #68 of AASHTO M 43, ASTM D 448.
2. SAND shall be sands with very little or no fines. Soils with a Unified System Classification of SW and SP, or an AASHTO classification of A-3 shall be required.
3. GRAVEL shall be gravel with less than 10% by weight fines. The sieve analysis of gravel shall be in accordance with Size #67 or #68 of AASHTO M43, ASTM D 448.
4. CONCRETE shall be Class B concrete in accordance with City Standard Specification Section 030020 for "Portland Cement Concrete".

C. Backfill Materials:

1. INITIAL BACKFILL is that material from the top of the bedding material to an elevation within 12 inches of the top of the pipe. This material shall be in accordance with City Standard for "Select Material" or material with a binder having a Plasticity Index between 0 & 13 and a liquid limit less than 46. The material shall be free of vegetation, debris, rocks with a diameter over 1.5 inches and clay lumps. This material shall not include soils with a Unified System Classification of OL, MH, OH, CH, and PT or soils with an AASHTO classification of A-7.
2. FINAL BACKFILL is that material placed on the initial backfill. The material shall be in accordance with a standard specification Section 022020 "EXCAVATION AND BACKFILL FOR UTILITIES AND SEWERS".

### 3. CONSTRUCTION METHODS

#### A. Trench Excavation:

See standard specification Section 022020 "EXCAVATION AND BACKFILL FOR UTILITIES AND SEWERS".

#### B. Handling of Materials:

1. HANDLING AND CARE of pipe shall be the responsibility of the Contractor. Pipe shall be unloaded at the point of delivery, hauled to and distributed at the site by the Contractor. Materials shall be handled with care and in accordance with the manufacturer's recommendations.
2. STORAGE AND SECURITY of materials shall be provided by the Contractor. Any material delivered to the site that is not to be incorporated into the work within 10 working days shall be properly stored off the ground. Stacking and handling of materials shall be done as recommended by the manufacturer.
3. REJECTED OR DEFECTIVE materials are those having cracks, flaws, or other defects. Rejected materials shall be marked by the Engineer and removed from the job site by the end of the day by the Contractor.
4. DISTRIBUTION OF MATERIALS at the work site shall be allowed provided that they are incorporated into the work within 10 working days. Materials shall not be placed on private property, unless written permission has been obtained from the owner by the contractor. Materials shall not be placed within five feet of the back of curb or edge of pavement without permission of the Engineer.

#### C. Alignment and Grade:

1. All pipes shall be laid and maintained to the required line and grade.
2. NO DEVIATIONS from design line and grade shall be allowed, unless authorized by the Engineer.
3. The Contractor shall be provided with offsets and cut sheets. The Contractor may use batter boards, laser, or other approved methods necessary to construct the sewer to design line and grade.

#### D. Pipe Placement:

1. GENERAL: Proper implements, tools, etc. shall be used by the Contractor for safe and efficient execution of work. All pipes shall be carefully lowered into the trench by suitable equipment in such a manner as to prevent damage. Under no circumstances shall pipe be dropped or dumped into the trench. The Contractor shall not lay pipe in the trench until the bedding and condition of the trench has been approved by the Engineer. The trench shall be free of water and maintained in that condition until the pipe has been laid, the joints have been completed, and the initial backfill has been completed.
2. CLEAN PIPE: All foreign matter or dirt shall be removed from the



interior of the pipe before lowering pipe into trench. The interior of pipe shall be maintained free of dirt during the remaining installation operations.

E. Jointing Pipe:

1. VITRIFIED CLAY PIPE: ASTM C-12

PLAIN END PIPE (PEP) has a polyurethane elasomer molded to both ends of the pipe. The factory applied PVC sleeve, or collar may be removed and used on either end of the pipe. The mating surface shall be cleaned and lubricated prior to assembly. The pipe shall be aligned in the trench and shoved home to compress the joint and to assure a tight fit between the inner surfaces. Care shall be taken to avoid damaging the collar.

BELL AND SPIGOT PIPE shall have bell and spigot mating surfaces wiped clean and free of dirt and other foreign matter. A lubricant shall be applied to the mating surfaces just prior to joining. Bell holes shall be excavated into the bedding material. The spigot end shall then be centered on grade into the bell of the previous pipe and shall be shoved home to compress the joint and to assure a tight fit between the inner surfaces. Pipe shall not be assembled in reverse order by pushing bell onto spigot. Care shall be taken to avoid damaging the bell.

2. POLY-VINYL CHLORIDE PIPE shall have mating surfaces of the gasketed joint wiped clean of dirt and foreign matter. A lubricant recommended by the coupling manufacturer shall be applied to the bell and spigot mating surfaces just prior to joining. The spigot shall then be centered on grade into the bell of the previous pipe and shall be shoved home to compress the joint and to assure a tight fit between the inner surfaces. Pipe shall not be assembled in reverse order by pushing bell onto spigot. When the pipe is being thusly installed, bell holes shall be excavated in the bedding material. When the joint has been made, the bell hole shall be carefully filled with material to provide for adequate support of the pipe. The spigot shall be centered within 1/4 inch of the home line marked on the spigot.

F. Bedding and Initial Backfill:

1. VITRIFIED CLAY PIPE: Bedding and initial backfill of VCP shall be in accordance with the details provided in the drawings. The class of bedding required will be dependent on trench width, pipe size and depth of cut. Bedding class shall be obtained from the table provided in the drawings.

CLASS A BEDDING: When included in the drawings shall be used for deep cut applications and shall include concrete cradle or concrete arch.

CLASS C BEDDING: When in a total sand environment, sand bedding material may be used in place of crushed stone or gravel.

CLASS D BEDDING: Shall require either bell holes or sand bottom as required for uniform support of pipe.

2. POLY-VINYL CHLORIDE PIPE: Bedding and initial backfill of PVC pipe

shall be in accordance with the details provided in the drawings. Bedding shall be well tamped regardless of type. The type of bedding required shall depend upon the depth of cut and ground water condition and shall be as specified below:

BOTTOM OF TRENCH IN GROUNDWATER

<u>Depth of Cut</u>	<u>Required Bedding</u>
Less than 20 feet	Gravel or Crushed Stone
Over 20 feet	Crushed Stone

BOTTOM OF TRENCH NOT IN GROUND WATER

<u>Depth of Cut</u>	<u>Required Bedding</u>
Less than 15 feet	Sand, Gravel, or Crushed Stone
Less than 20 feet	Gravel or Crushed Stone
Over 20 feet	Crushed Stone

G. Final Backfill:

See standard specification Section 022020 "EXCAVATION AND BACKFILL FOR UTILITIES AND SEWERS".

4. TESTING AND CERTIFICATION

A. Leakage Testing: (Required for all types of pipe)

1. EQUIPMENT FOR LEAKAGE TESTING shall be furnished and installed by the Contractor. The Contractor shall test the entire system for leaks. This work shall be witnessed by the Engineer.
2. VITRIFIED CLAY PIPE shall be tested in accordance with ASTM C 828 "Standard Practice for LOW-PRESSURE AIR TEST OF VITRIFIED CLAY PIPE LINES.
3. POLY-VINYL CHLORIDE (PVC) PIPE shall be tested in accordance with Uni-Bell Plastic Pipe Association "Recommended Practice for LOW-PRESSURE AIR TEST OF INSTALLED SEWER PIPE" UNI-B-6. The requirements of which are summarized by the following Equation:

$$T = .00237D^2L \qquad \text{Eq. 1}$$

Where: T = Minimum allowable time (seconds) for a pressure drop if 1 psi gage pressure  
D = Nominal pipe diameter (inches)  
L = Length of pipe run (feet)

The test section shall be plugged and subjected to a test pressure not in excess of 5 psi. The time required for a 1 psi pressure drop shall be measured and not exceed the value obtained in Eq 1.

B. Deflection Testing: (Required for PVC Pipe)

1. EQUIPMENT FOR DEFLECTION TESTING shall be provided by the Contractor. Mandrels shall be provided by the Contractor and shall be of machined rigid corrosion resistant pipe with a length not less than 1.5 diameters. Mandrels will be sized for SDR 26 PVC pipe at 5% deflection. The outside diameter of the standard mandrels shall be as follows:

<u>Nominal Size (inch)</u>	<u>Mandrel O.D. (inch)</u>
8	7.11
10	8.87
12	10.55
15	12.90
18	15.76
21	18.56
24	20.87
27	23.51
30	27.14

2. TESTING shall be done by the Contractor and witnessed by the Engineer. All pipe shall be tested for deflection no less than 30 days after placement of backfill. The Contractor may wish to check pipe immediately after backfilling for job control. However, this shall not qualify as acceptance testing. No pipe can be tested for formal acceptance until it has been in place, complete with backfill for at least 30 days.

C. Retesting:

ANY DEFECTIVE WORK OR MATERIALS shall be corrected or replaced by the Contractor and retested. This shall be repeated until all work and materials are acceptable.

5. SOIL BORINGS

The City does not assume responsibility for subsurface information. Soil data and other subsurface information shown on the plans or in the appendix is without warranty as to correctness of fact or interpretation.

6. BRACING AND SHORING

Trenching operation shall comply with Worker Safety Requirements for Excavation and Trenching Operations. If, for whatever reason, the trench width at the top of pipe must exceed that width indicated in the bedding details, the Contractor shall modify bedding as required by the Engineer to accommodate the additional load on the pipe.

7. MEASUREMENT & PAYMENT

Unless indicated otherwise in the Proposal, Gravity Sanitary Sewers shall be measured by the linear foot for each size and depth of sewer installed as follows:

- A. Between centers of manholes.
- B. From the center of a manhole to the end of the line.
- C. From the end of an existing stub to the end of the line or center of the existing manhole.

Depth shall be measured from flow line of pipe to ground surface over centerline of the pipe at time of construction. Measurements to be made at manholes, at intervals not to exceed fifty feet, and at breaks in ground profile. Bedding shall not be measured and shall be considered subsidiary to pipe, unless included as a separate bid item in the proposal.

De-watering will be measured for pay by the linear foot of trench, if all the following conditions are met: (1) de-watering was included as bid item in the proposal by the Engineer; (2) de-watering of the trench was accomplished by well point system; and (3) the use of well points was necessary and was authorized by the Engineer.

Payment shall include all labor, pipe, bedding, de-watering, equipment for hauling, trench excavation, and all cleaning up and other incidentals necessary to install the pipe complete in place.

SECTION 027604  
DISPOSAL OF WASTE FROM SANITARY SEWER  
CLEANING OPERATIONS

1. SCOPE:

This specification governs all work required for disposal of waste from sewer cleaning operations required to complete the project.

2. METHODS:

Sewer grit, rubble, dislodged bricks and other such inorganic waste that is removed during cleaning shall not be allowed to continue down stream of the operation. Organic solids that remain in suspension would be allowed to continue down stream through the sanitary sewer system.

A weir or other suitable trap shall be installed and maintained by the Contractor for the collection of such waste.

This material shall be de-watered and delivered by the Contractor to a facility that is authorized to receive it. If this material is free of organic sludge and is sufficiently de-watered to pass the paint filter test, it would be acceptable for disposal at the Elliott Sanitary Landfill subject to prior approval of the facility and the associated disposal fees.

The Contractor has the option of using the City's de-watering facilities. The City has six drying beds, each with a 1-foot high containment wall each with an area of about 2,300 square feet. These drying beds are at the Greenwood Wastewater Treatment Plant, 1541 Saratoga. The Contractor would be required to haul and handle the material to, at and from the facility as well as the restoration of drying beds. Restoration of the drying beds includes the removal of all the de-watered material and the replacement of the existing sand bed with new sand. All work required within the treatment plant, including the replacement of sand shall be in accordance with the requirements set forth by the Plant Supervisor. The use of the drying beds would be subject to prior approval of the facility and the associated de-watering fees.

If the City's facilities are used for de-watering or disposal of waste, the Contractor shall be responsible for making contact with the appropriate Solid Waste or Wastewater Officials or both, making all arrangements for the use of City facilities, scheduling of delivery and pickup, etc. Materials and handling operations shall meet the requirements set forth by said Officials. Failure to meet these requirements shall be cause for rejection of the materials by either the landfill or the treatment plant operations. Proper disposal of this waste shall be responsibility of the Contractor. The Contractor shall provide the Engineer with written documentation of the proper disposal of this waste.

3. MEASUREMENT & PAYMENT:

Unless indicated otherwise in the Proposal, This work shall be considered subsidiary to the project.

SECTION 027606  
SANITARY SERVICE LINES

1. SCOPE:

This specification governs all work and materials necessary to construct the Sanitary Services Lines required to complete the project. Sanitary Service Lines are those lines, constructed in public ROW, from the service tee on the main up to and including the clean-out at the property line.

2. MATERIALS:

Pipe and fittings for sanitary service lines shall be PVC in accordance with ASTM D2665 and ASTM D3311 with a minimum size of 4 inches. Solvent cement for PVC shall comply with ASTM D2564. No co-mingling of different materials except through the use of proper adaptors. Adaptors shall have a stainless steel or fiberglass shear ring.

3. CONSTRUCTION METHODS:

Where possible, service tees or wys shall be placed along the main as required for services (no taps).

The minimum size pipe for services shall be 4" diameter for residential and 6" for commercial. Minimum slopes for 4" and 6" pipes shall be 1/8 (S=0.01) and 1/16 (S= 0.005) inches per foot respectively. Sanitary sewer service lines shall cross under water mains

The Contractor shall be responsible for establishing alignment and maintaining grade for the proposed service.

Trenches shall be excavated in such a manner which will minimize damage to surface improvements. After installation, the excavated material shall be tamped into the trench to a minimum of 95% Std. Proctor and the surface restored to a condition acceptable to the Engineer. Lines shall be bored, jetted, or jacked under sidewalks, driveways, and other such improved surfaces; unless authorized by the Engineer.

Service lines shall be leakage tested with the main sewer.

4. MEASUREMENT & PAYMENT:

Unless indicated otherwise in the Proposal, Sanitary Service Lines shall be measured as individual units for each connection made to the main. Measurement shall include but not be limited to; the line from the tee on the main to, and including, the clean-out at the property line. Payment shall include all labor, materials, equipment, trench safety and incidentals necessary for Sanitary Service Lines required to complete the project.

SECTION 027608  
PRIVATE SEWER SERVICES (S-39)  
(FOR RESIDENTIAL AND COMMERCIAL APPLICATION)

1. Scope:

This section governs the furnishing of all labor, equipment, tools and materials necessary for the construction of private sewers services as shown on the plans, as outlined herein and as necessary to complete the project. Private sewer services lines (aka Building Sewers) are defined as the sewer piping extending from the customers structure to the clean-out at the property line.

2. General:

Construction of private sewer services shall comply with the provisions of the Standard Plumbing Code as published by the Southern Building Code Congress and as adopted, with local amendments, by the City of Corpus Christi, in addition to the plans and specs. In case of conflict, between the code and the plans the more stringent prevails.

3. Materials:

PVC pipe and fittings for sewers shall be in accordance with ASTM D2665 and ASTM D 3311. Solvent cement for PVC shall meet ASTM D2564. Asbestos cement pipe, concrete pipe and cast iron pipe shall not be used as sewer pipe. There shall be no co-mingling of different materials except through proper adaptors. Section (504.4.2) of the Standard Plumbing Code. Rejected materials shall be marked and removed from the job site.

4. Permits:

Normal plumbing permit application and fee requirements of the Standard Plumbing Code as adopted by City Code shall apply to this project. A plumbing permit for each lot will be issued to the Contractor by the Building Inspections Department of the City of Corpus Christi. The contractor shall make application for permits upon award of the contract.

5. General Obligations:

(a) Contractor: The contractor shall construct private sewer services in accordance with the plans and these specifications in a neat and workmanlike manner. The route of the proposed private service shall be determined by the Contractor subject to approval of the Owner and the Engineer. All work on private services shall be supervised and inspected by a licensed plumber. Good relationships with the public are essential to the success of this project. The contractor shall make all the required notifications and notices to the owner/occupants in the area. The work shall be accomplished with minimal inconvenience to the public and owner/occupants. The contractor shall cooperate with all City employees involved in the execution of this contract.

(b) City: The Engineer will review work proposed by the Contractor and the City Plumbing Inspector shall inspect the installation.

6. Sequence of Work:

(a) City will mail out general letter to property owners describing the project with Form WS-1 (See Appendix) for execution.

(b) Contractor to acquire authorizations from owners for site inspections using Form WS-1 in Appendix from those property owners not responding to general letter. The contractor is encouraged to take photographs of before and after conditions on each lot.

(c) Contractor performs site inspection and fills out required form and submits copy of inspection report and Site Plan Showing Route to Engineer. (Private Sanitary Sewer Service Inspection Report & Routing Recommendations Form S-2 and Sample Site Plan in Appendix).

(d) Form S-2 reviewed by Engineer and property owner. This should be completed prior to installing main sewer.

(e) Contractor notifies owner/occupant of proposed construction and acquires authority for proposed construction on Form S-2 and Site Plan in Appendix.

#### 7. Construction Methods:

(a) Clean outs - A two-way, 4-inch double riser clean out shall be installed at the connection of proposed private sewer and building sewer and also a single wye riser at the property line. Clean outs shall be placed at change in direction and at a maximum spacing of 75 feet. All clean outs shall be brought to finish grade.

(b) Bends - Change in direction in drainage piping shall be made by the appropriate use of 45° wyes, long sweep quarter bends, one-sixth, one-eighth, or one-sixteenth bends or by a combination of these, or equivalent fittings.

(c) Disconnection from Old Main - Abandoned service lines shall be plugged below ground surface with concrete.

(d) Fittings prohibited - A straight tee shall not be used. Saddle type fitting or running threads shall not be used. Pipe shall not be drilled or tapped unless approved by the Engineer. A fitting having a hub in the direction opposite to flow shall not be used, unless the pipe is cut by a saw or snap cutter, which will assure clean, smooth cuts of the pipe. Adaptors for connecting new pipes to existing piping shall be of the non-shear type. Adaptors with internally fitted fiberglass support ring as manufactured by DFW/HPI or Adaptors with externally fitted stainless steel shear rings and hardware as manufactured by Fernco or approved equal shall be required for matching pipe with the same nominal dimensions such as 4" clay to 4" plastic. Other types of adaptors that do not have this feature shall not be used.

(e) Protection of foundations - Trenches shall not be excavated within 3 feet of foundations. (See Foundation Protection Exhibit in Appendix) Where trenching is not allowed because of insufficient clearance from foundation, the private service shall be installed in a bored or jacked casing. The ends of each casing shall be wrapped with Class [A] subsurface Geotextile per AASHTO M288. This steel casing will only be measured for pay when it falls within the areas where open trenching is not allowed because of it being excessively close to existing foundations. Boring under surface improvements such as existing driveways, sidewalks, etc. shall not require casing.

(f) Pipe size - Minimum pipe size for private services shall be 4" diameter for residential and 6" diameter for commercial.

(g) Slope/velocity - Minimum slope of services shall be not less than 0.01 or 1/8 inch per foot.



(h) Installation - Materials shall be installed in accordance with manufacturer requirements.

(I) Alignment/grade - The contractor shall be responsible for establishing alignment and grade for proposed services. (See paragraph (g) above.)

(j) Surface Restoration - Separate trenches (one for water and one for sewer) separated by undisturbed or compacted earth shall be excavated. Trenches shall be excavated in such a manner which will minimize damage to surface vegetation. After installation, the excavated material shall be tamped into the trench and the surface restored to like or better condition acceptable to the Engineer. Lines shall be bored, jetted or jacked under sidewalks, driveways or other such improved surfaces; unless authorized by the Engineer.

(k) Electrical ground - Where required by the building code, electrical ground wires shall be installed to assure any appliances grounded to the plumbing system remain grounded.

(l) Maintenance of service - Sanitary services shall be installed with a minimum of inconvenience to the occupant of the house. The contractor shall provide continuous service of all utilities during construction, where practical. In the event of damage to existing utility, restoration is the responsibility of the contractor.

(m) Interruption of service - In the event that an unavoidable interruption of service is anticipated, the contractor shall advise the building occupant (s) a minimum of 24 hours in advance of the interruption. After the service has been interrupted, the contractor shall expeditiously continue work until service has been restored. In no case shall sewer service be interrupted for more than four (4) hours.

(n) Testing - The Private sewer shall be tested for leaks prior to connecting with the clean-out at the property line. The private sewer service shall be plugged at the down stream end and a ten foot test riser placed at the up stream end(s). The line shall be filled with water and no measurable leaks shall be allowed. The Air Test [417.2.2] may be used at the option of the Contractor. Test equipment shall be provided by the Contractor.

#### 8. - Measurement and Payment:

Unless indicated otherwise in the Proposal, Private Sewer Services shall be measured per each service installed. Some services may require more than one connection on the owner's pipe. For example, house with garage apartment. All connections of this nature made to common lot owner shall be considered one service. Rental house of a common owner shall be measured as separate unit for each house. Payment shall be at the contract unit bid prices and shall constitute full compensation for furnishing and installing all pipes, fittings and incidentals, trenching, trench safety, boring, jetting or jacking, flushing, surface restoration and all other work or material required to provide sewer service from the structure(s) to the sanitary clean-out at the property line.

SECTION 027610  
TELEVISED INSPECTION OF CONDUITS (S-125)

1. SCOPE

This specification shall govern for all work, equipment, and materials required to provide for remote closed circuit television inspection and documentation of sanitary sewer or other lines as required in the plans and specifications.

2. INSPECTION CONDITIONS

Closed circuit television inspection will typically be done under one or more of the conditions listed below, as called for elsewhere in the plans and specifications.

2.1 Inspection and Documentation of Existing Line for Evaluation:

Upon completing cleaning operations on an existing line, a closed circuit television camera will be pulled through each line segment. The intent of this process is to carefully inspect the interior of the existing line and obtain detailed information for further study. The Contractor shall provide the Engineer with a television report log, and a color professional grade VHS format video tape recorded in standard play (SP) mode for each line or line segment inspected. The log shall consist of observations recorded on television inspection forms, and shall specifically indicate items such as deviations in line and grade, abnormal conditions of pipe barrel and joints, locations of dropped or broken taps, and locations and quantities of any sources of infiltration or inflow. The distance from the beginning point, such as a manhole in the case of sanitary sewers, shall be noted on each observation on the report forms.

2.2 Inspection & Documentation of Existing Lines Prior to Rehabilitation:

After point repairs or any problems along the line have been fixed and the line cleaned, a closed circuit television camera will be pulled through each line segment. The intent of this process is to carefully inspect the interior of the existing line to show that the line is in a condition to receive the liner. The Contractor shall provide the Engineer with a television report log, and a color professional grade VHS format video tape recorded in standard play (SP) mode for each line or line segment inspected. The log shall consist of observations recorded on television inspection forms. The distance from the beginning point, such as a manhole in the case of sanitary sewers, shall be noted for each observation made on the report forms.

2.3 Inspection and Documentation of Lines after Rehabilitation:

Upon completion of the rehabilitation (Lining) of an existing line including any appurtenances such as manholes and tie ins in the case of sanitary sewers, a closed circuit television camera shall be pulled through each completed line segment. The intent of this process is to carefully inspect the interior of the rehabilitated line to determine the location and extent of any unacceptable work. The Contractor shall

provide the Engineer with a television report log, and a color professional grade VHS format video tape recorded in standard play (SP) mode for each line or line segment inspected.

This log shall consist of observations recorded on television inspection forms, and shall indicate the internal condition of the rehabilitated line, and more particularly any deficiencies therein. The distance from the beginning point, such as manhole in the case of sanitary sewers, shall be noted for each observation made on report forms.

If a section or sections of line require additional work after the inspection described above, another inspection will be performed on the re-worked section or sections of line to determine if the work is now acceptable. A revised television report log and an updated video tape recording for these re-worked area inspections will also be required and will be furnished to the Engineer by the Contractor. This process will be repeated as required until it has been determined that the entire line is acceptable. Unless directed otherwise by the Engineer, the Contractor will be required to furnish a separate video tape for each inspection made as well as a tape showing the entire length of the completed line in sequence.

#### 2.4 New Line Upon Completion:

Upon completion of the installation of the new line, including any appurtenances such as manholes in the case of sanitary sewers, a closed circuit television camera shall be pulled through each completed line segment. The intent of this process is to carefully inspect the interior of the completed line to determine the location and extent of any unacceptable work. The Contractor shall provide the Engineer with a television report log, and a color professional grade VHS format video tape recorded in standard play (SP) mode for each line or line segment inspected. This log shall consist of observations recorded on television inspection forms, and shall indicate the internal condition of the completed line and more particularly any deficiencies therein. The distance from the beginning point, such as a manhole in the case of sanitary sewers, shall be noted for each observation made on report forms.

If a section or sections of line require additional work after the inspection described above, another inspection will be performed in the re-worked section or sections of line to determine if the work is now acceptable. A revised television report log and an updated video tape recording for these re-worked area inspections will also be required, and will be furnished to the Engineer by the Contractor. This process will be repeated as required until it has been determined that the entire line is acceptable. Unless directed otherwise by the Engineer, the Contractor will be required to furnish a separate video tape for each inspection made as well as a tape showing the entire length of the completed line in sequence.

### 3. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, this work shall not be measured for payment, and shall be considered subsidiary to the various other bid items in the contract.



SECTION 027612  
GLASS FIBER REINFORCED LINER PIPE FOR SLIPLINING  
GRAVITY SEWERS (S-67)

1. SCOPE

- 1.1 This specification covers glass fiber reinforced plastic mortar pipe intended for use as a liner to rehabilitate existing pipelines conveying sanitary sewage, stormwater and those industrial wastes and corrosive fluids for which the pipe is determined to be suitable.
- 1.2 The pipe furnished under this specification shall be a composite structure manufactured from thermosetting resin, glass fiber reinforcement and aggregate. The pipe shall have a chemical resistant resin inner surface liner meeting ASTM specification D-3262. This liner shall be capable of conveying sewage flows with a pH range between 3 and 11, inclusive.
- 1.3 Liner pipe furnished under this specification shall be furnished in classes designated as "gravity" and intended to operate at up to 25-psig internal pressure.

2. MATERIALS

- 2.1 The structure of the pipe shall be a composite of resin binder, an aggregate filler and fiberglass reinforcement.
  - 2.1.1 Resin - The resin shall be a thermosetting polyester or epoxy resin.
  - 2.1.2 Aggregate - The aggregate shall be siliceous and conform to the requirements of the current specifications for concrete aggregate (ASTM C-33), except that the requirements for the gradation shall not apply.
  - 2.1.3 Fiberglass - The fiberglass reinforcement shall be a borosilicate "E" type glass roving with a polyester compatible finish.
  - 2.1.4 Liner - The chemical resistant resin liner shall be a reinforced thermosetting resin without aggregate filler.
- 2.2 The gaskets used with this pipe shall conform to the requirements of ASTM F-477, "Specifications for Elastomeric Seals (Gaskets) for Joining Plastic Pipe." Gasket material shall be an elastomer with a chemical resistance equal to or better than that of Ethylene Propylene Copolymer and Terpolymer (EPDM) to the following:

Bleach Solutions	Chloride	Detergent Solutions
Ferric Sulfide	Sewage	Soap Solutions
Sulfuric Acid (Dilute)	Vegetable Oils	

3. PHYSICAL REQUIREMENTS

- 3.1 Axial Compressive Strength: Each length of liner pipe shall have sufficient strength to withstand, without structural damage, an axial compressive proof load of 110% of the minimum longitudinal compressive strength shown in the beam strength requirements of ASTM D-3262. This is a design qualification requirement and a copy of the manufacturer's test report shall be the basis of acceptance.
- 3.2 Joints: The liner pipe shall be sealed with a solid, uniform cross section gasket conforming to Section 027612.2.2. The gasket shall be contained in a groove and shall not support the weight of the pipe when two sections are joined. The joint assemblies shall be so formed that when pipe sections are drawn together, the pipe shall form a continuous watertight conduit, and shall provide for slight movements of any pipe sections in the pipeline due to contraction, settlement or lateral displacement.

- 3.3 Stiffness Factor: Liner pipe shall meet the requirements of ASTM D-3262, for a nominal pipe stiffness of 46 psi.
- 3.4 Axial Tensile Strength: Each length of liner pipe shall have sufficient strength to withstand, without structural damage, an axial tensile proof load of 110% of the minimum longitudinal tensile strength shown in the beam strength requirements of ASTM D-3262. This is a design qualification requirement and a copy of the manufacturer's test report shall be the basis of acceptance.

#### 4. DIMENSIONS AND PERMISSIBLE VARIATIONS

- 4.1 The nominal size of liner pipe furnished for this project shall meet the following requirements:
- Exist. Line I.D. = 24 in.  
Max. Liner Pipe O.D. = 20 in.  
Min. Liner Pipe I.D. = 18.00 in.
- 4.2 The inside diameter of the liner pipe at any point shall not vary from the nominal inside diameter by more than 1 percent or one quarter inch, whichever is greater.
- 4.3 The typical laying length of each liner pipe section shall be 20 feet, plus or minus 2 inches. Where existing line conditions warrant 10 foot nominal length, plus or minus 2 inches, will also be allowed with the approval of the Engineer.
- 4.4 The average wall thickness of the pipe shall not be less than the nominal wall thickness published in the manufacturer's literature current at the time of purchase, and the wall thickness at any point shall not vary from the nominal by more than 10 percent. The manufacturer shall provide sufficient data to demonstrate that the pipe supplied provides a 50-year service life with a maximum external hydrostatic pressure of 10 feet of water above the pipe center line.
- 4.5 The Contractor shall specifically note the relatively small size of the annular space anticipated between the existing line and the proposed liner pipe. By submitting a bid based on this material option, the Contractor is indicating that sliplining under these conditions is entirely feasible, and assumes all responsibility for any difficulties encountered resulting from these conditions.

#### 5. WORKMANSHIP, FINISH AND APPEARANCE

- 5.1 The inside surface of each liner pipe shall conform to the requirements of ASTM D-3262 and shall be free of bulges, dents, ridges, or other defects that result in a variation of an inside diameter of more than one-eighth inch from that obtained on adjacent unaffected portions of the surface.
- 5.2 Joint sealing surfaces shall be free of dents or gouges that will affect the integrity of the joints.
- 5.3 No glass fiber reinforcement shall penetrate the interior surface of the pipe wall.

#### 6. CONSTRUCTION METHODS

- 6.1 General: The Contractor shall provide all necessary insertion/work pits or shafts as required to complete the proposed sewer rehabilitation. The location of any access pits or shafts shall be subject to the approval of the Engineer. The number of access pits or shafts shall be kept to a minimum.

The size of access pits or shafts shall be kept to the minimum necessary for proper insertion of the liner pipe. All pits shall be constructed with properly applied vertical side support, etc., in accordance with applicable OSHA requirements. At access pits, or other points where the liner pipe is exposed, the Contractor shall encase the liner as detailed in the plans.

Pipe and any required fittings shall be stockpiled in a safe manner at each Contractor staging area or insertion/work pit location. The stockpiling shall be arranged so as to cause a minimum of interference to pedestrian and vehicular traffic. No stockpiling will be permitted on the opposite side of the street from the construction area without prior approval of the Engineer.

When handling liner pipe, the Contractor shall take all precautions necessary to avoid damage to the pipe. Dragging of the pipe over sharp objects shall be avoided. Pipe with deep cuts, cracks, scratches or gouges shall be rejected and replaced.

- 6.2 Cleaning: All lines to be rehabilitated shall be cleaned prior to the installation of the liner. The Contractor shall select the method of cleaning, and shall submit details for accomplishing same to the Engineer for approval prior to beginning cleaning operations. The Contractor shall take such precautions as necessary to protect the existing line from further damage during the cleaning process and shall be responsible for repairing any such damages. All materials resulting from the cleaning operations shall be removed at the downstream manhole or insertion/work pit of the section being cleaned. It is the intent of the plans and specifications that all sludge and/or debris within the existing line be removed. The definition of "all" in this context will be interpreted as the removal of any and all sludge or debris that would interfere with the proper installation of the liner pipe as determined by the liner pipe manufacturer or the Engineer. In no case shall the amount of sludge or debris remaining within the existing line be such as to result in more than a one inch depth of water being ponded upstream of the remaining sludge or debris.

- 6.3 Initial Television Inspection Upon completion of the cleaning operation and prior to insertion of the liner material, a closed circuit television inspection will be performed in accordance with Standard Specification 027900. In particular, the interior of the existing main shall be carefully inspected to determine the location and extent of any condition which may prevent proper installation of lining materials, as well as to confirm those cleaning operations have been completed in accordance with paragraph 6.3 above.

All observed obstructions or other line conditions which may interfere with liner installation shall be removed or otherwise corrected by the Contractor before initiating liner insertion.

- 6.4 Maintenance of Existing Sewer Flows The Contractor shall make all necessary arrangements and provide all necessary equipment to maintain sewage flows at all times. This shall be accomplished by allowing flows to pass around and through the liner pipes or by other means acceptable to the Engineer. The Contractor will be responsible for any necessary bypassing of sewage around the section or sections of line to be sliplined. Under no circumstances will dumping of raw sewage on private or City property be allowed. Bypassing shall be made by pumping the sewage into a downstream manhole or adjacent system, or other methods as may be approved by the Engineer. The pump and bypass line shall be of adequate capacity to handle the existing flow, as well as any anticipated peak or surcharge flow. If bypass pumping is not a continuous operation, flow through the sewer line shall be restored at the end of each work day. Complete plugging of the existing line will not be permitted unless adequate bypass capacity for anticipated flows is provided or other means of handling the flows is approved by the Engineer.

- 6.5 Liner Pipe Installation Liner pipe grade shall be maintained equal to the grade of the sewer being relined. At times when work is not in progress for whatever reason, open ends of pipe or fittings shall be protected.

Pipe shall not be installed if the condition of the existing sewer line is unsuitable or if the weather is such that anticipated sewer flows will be such that would interfere with proper insertion operations.

The Contractor shall be responsible for and take all necessary precautions to ensure that no liner pipe flotation, adverse pipe grades, or pipe rotation about the vertical axis results, or collapse of the liner pipe occurs during insertion or grouting operations. Multiple low pressure grout lifts are recommended. Grouting shall be in accordance with Section 027612.6.7.

Within the insertion pit, the top half of the exposed existing pipe is to be removed to the springline. The bottom half is to be left in place where it shall serve as a cradle for the liner pipe. The liner pipe shall be either jacked, pushed, or pulled into the existing pipe as determined by the Contractor. An aqueous solution of bentonite may be used as a lubricant to minimize jacking loads. A tapered guide may be attached to the leading end of each section to be installed to help the liner pipe clear small obstructions. A jacking ring shall be used to distribute the load according to manufacturer's recommendations for installation of the liner pipe.

Pipe jointing shall be carried out in strict accordance with the manufacturer's recommendations. The Contractor shall provide a suitable means for measuring jacking loads, as approved by the Engineer, and shall monitor the load as the liner pipe is being installed. All gauges or other mechanisms used to monitor jacking loads shall be calibrated prior to use on the project. Documents certifying this calibration shall be furnished to and approved by the Engineer prior to beginning jacking operations. This calibration shall be done no more than six months prior to beginning jacking operations, and shall be considered valid for a period of twelve months from the date of the calibration. In the event this twelve months period elapses prior to completing jacking operations on the project, re-calibration of gages will be required. Total jacking loads shall not exceed the values recommended by the manufacturer. For each section to be lined, insertion shall be one continuous operation until the planned termination point is reached. If at any time the load appears to rise or fall non-uniformly, indicating possible obstruction or failure of the liner pipe, jacking operations shall be terminated immediately, and the liner shall be inspected for damage or obstructions. Any damaged pipe shall be repaired or replaced as approved by the Engineer, and any obstructions removed before resuming jacking operations.

Closure in the insertion pit after jacking may be accomplished using a long bell closure kit or other methods, as approved by the Engineer.

- 6.6 Service/Lateral Line Connections After the liner pipe has been jacked into place and allowed to recover, any sewer service or lateral lines not entering the existing line at a manhole shall be connected to the new liner pipe using approved prefabricated tapping saddles.
- 6.7 Grouting of Annular Space: The annular space between the Glass Fiber Reinforced Liner pipe and the existing pipe shall be filled with a grout as per Section 027626.
- 6.8 Backfill of Access/Work Areas The Contractor shall backfill all points where the liner pipe has been exposed, such as insertion pits, access shafts, manhole or service connections, etc., in accordance with the details included in the plans.
- 6.9 Manhole Replacement In those places where the entrance pit is excavated at an existing manhole, the manhole shall be replaced with a new manhole in



accordance with the applicable specifications and details included in the plans and contract documents.

- 6.10 Inspection of Completed Work A final closed circuit television inspection in accordance with Standard. It is the intent of the plans and specifications that the entire lengths of the completed line rehabilitation be inspected, however, the Contractor shall have the option of performing final inspection of sections of the rehabilitated line as completed. The time, location, and length of final inspections shall be as approved by the Engineer.
- 6.11 Clean Up After installation work has been completed, the Contractor shall clean up all work areas and restore the ground cover to a condition equal to or better than that existing prior to construction. This shall include restoration of any driveways, sidewalks, street pavements, etc. damaged as a result of construction operations. Any excess pipe, spilled concrete or grout, or other construction related materials shall be removed from the site and properly disposed of by the Contractor. All final clean up will be subject to the approval of the Engineer or his designated representative.

## 7. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, Glass Fiber Reinforced Liner Pipe for Sliplining shall be measured by the linear foot, complete in place. If the liner pipe is installed "through" manholes, the liner will be measured and paid for based on the actual line distance between centers of upstream and downstream manholes. If the liner pipe is not installed completely through manholes, such as in the case of changes in pipe alignment or changes in pipe size, the liner will be measured and paid for based on the actual line distance from inside face of an upstream manhole wall to the inside face of a downstream manhole wall.

SECTION 027614  
CURED-IN-PLACE-PIPE (CIPP)  
FOR REHABILITATION OF GRAVITY SEWER

1. SCOPE

This specification shall govern for all work necessary for installing CIPP required to complete the project.

2. REFERENCE SPECIFICATIONS

This specification references ASTM D5813, ASTM F1216, ASTM D 2122, ASTM C581, and ASTM D790 which is made a part hereof by such reference and shall be the latest edition and revision thereof. ASTM F1216 - Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube, shall govern when not addressed by this specification.

3. GENERAL

The CIPP shall be installed in an existing pipe and designed to provide chemical resistance, prevent exfiltration and infiltration, and support all external loads acting on it. The process is defined as the rehabilitation of sewer lines by pull-in or inversion of a thermosetting resin impregnated flexible tube into existing sewer pipe, with one layer or more, capable of carrying resin, withstand installation pressure and curing temperature, utilizing a water column. Curing is accomplished by circulating hot water (or other approved fluid) throughout the length of the new tube to cure the thermosetting resin into a hard impermeable pipe with the plastic coated outer layer that is compatible with the resin system used. The new pipe shall extend the full length of the original pipe (i.e. from manhole to manhole), and shall provide a structurally sound, jointless, closefitting, Cured-In-Place-Pipe without delimitation or lifts, and with uniformly smooth interior providing hydraulic flow equal to or greater than the existing sewer in original condition.

4. MATERIALS

Only materials from pre-approved manufacturers shall be allowed for this work. Pre-approved manufacturers are, insituform, inliner, and U-liner.

CIPP shall be property sized Type III cured-in-place thermosetting resin sewer pipe in accordance with ASTM D5813. The tube shall consist of one or more layers of flexible needled felt or an equivalent nonwoven or woven material or a combination of nonwoven and woven materials, capable of carrying resin, withstanding installation pressures and curing temperatures. The flexible felt fiber tube shall be fabricated to a size that when installed it will neatly fit the internal circumference of the existing pipe specified by the Engineer. An allowance shall be made for some circumferential stretching during inversion. The minimum length shall effectively span the distance from the inlet to the outlet of the respective manholes unless otherwise specified. The Contractor shall verify the circumference of the host pipe and the lengths in the field before impregnation of the tube with the resin. Individual insertion runs can be made over one or more manhole sections as determined in the field by the Contractor and approved by the qualified factory field service representative and Construction Engineer.

- 4.1 Tube: The tube shall consist of one or more layers of flexible needled felt or an equivalent nonwoven or woven material or a combination of nonwoven and woven materials that are compatible with the resin system

used and are capable of supporting and carrying resin. The tube shall be capable of withstanding installation procedures and curing temperatures. Longitudinal and circumferential joints between multiple layers of a tube should be staggered to not overlap. The tube shall be fabricated to fit its final in-place position in the existing pipe, with allowance for stretch as recommended by the tube manufacturer. The elongation or expansion of the flexible tube during installation, both longitudinally and circumferentially should be limited to 5-10% to minimize reduction of the finished wall thickness.

- 4.2 Tube Coating: The inside or outside surface, or both, of the tube shall be coated with a plastic flexible material that is compatible with the tube and the resin system used. The coating shall allow visual inspection of the proper impregnation of the tube fabric with resin. The final inside flexible plastic coating will form the inner layer of the finished pipe and is required to contain the impregnated resin in the tube.
- 4.3 CIPP Wall: The layers which constitute the pipe wall must be such that when the thermosetting resin cures the Cured-In-Place-Pipe has no delimitation, dry spots or lifts.

The minimum allowable wall thickness for CIPP shall be per table 1 and as directed by the Engineer after review of TV inspection. (Table 1)

Table 1 - Wall Thickness For CIPP			
H (Ft)	DR		T (in.)
	Sound Host Pipe	Deteriorated Host Pipe	
<10	60	50	$T = \frac{D}{DR}$
10-15	50	40	
15-20	45	35	
20-25	40	30	
>25	40	25	
H, H right of cover over pipe (ft)		DR, Dimension Ratio, D/T	
T = Wall Thickness of CIPP (in)		D= Nominal Diameter (in)	

When cured, the CIPP must form a mechanical bond with the conduit and the wall color of the interior pipe surface of the CIPP after installation shall be a light reflective color so that a clear detail examination with closed circuit television inspection equipment may be made. Unless otherwise specified, the Contractor shall furnish a general purpose, unsaturated, polyester resin, and catalyst system compatible with the inversion or pull-in process that provides cured physical strengths specified herein. The existing sewers, where designated or required shall be lined using material and workmanship which can be adapted to the restrictions of the work site. The Contractor shall not begin this phase of the work until there is sufficient material on hand to complete the job and required submittals as per 4.4 are submitted to the qualified factory field service representative and Construction Engineer, prior to use of the lining material.

4.4 Submittal: The following items shall have submittals and shall be in conformance with the requirements of Special Provisions.

4.4.1 RESIN:

- a. Submit technical data sheet showing physical and chemical properties for the proposed resin to be used in the project.
- b. Submit test results to show compliance with ASTM C581 - Standard Practice for Determining Chemical Resistance of Thermosetting Resins Used in Glass Fiber Reinforced Structures Intended for Liquid Services.

4.4.2 TUBE:

- a. Submit technical data sheet showing physical properties.

4.4.3 CIPP:

- a. Prepare and submit curing schedule.
- b. Submit copies of curing log sheets with temperature reading prior to curing, during curing and during cool down for each installation section. Must be submitted at least weekly.
- c. Submit, copies of all test results performed by the Contractor's Independent Testing Laboratory for test listed in Section 9, testing.
- d. Submit Contractor's Quality Control Plan and/or Procedures showing control conditions used during impregnation of the resin to ensure proper materials and proper dispersion is achieved in the wet out process.
- e. Submit pre-installation TV inspection video after cleaning, and Acceptance TV inspection video after rehabilitation as per Section 027610.

5. CONSTRUCTION METHODS

5.1 Pre-Installation Procedures: The following installation procedures shall be adhered to unless otherwise approved by the City's Engineer.

5.1.1 Safety: The Contractor shall carry out his operations in strict accordance with all applicable OSHA standards. Particular attention is drawn to those safety requirements involving work on an elevated platform and entry into a confined space or the use of steam.

5.1.2 Access: It shall be the responsibility of the Contractor to locate and designate all manhole access points open and accessible for the work, and provide rights of access to these points. Traffic routing shall be per TCP approved by the Traffic Engineer. If a street must be closed to traffic because of the orientation of the sewer, the Contractor shall submit a proposed traffic control plan for approval to the City Traffic Engineer.

5.1.3 Pre-Installation Cleaning: It shall be the responsibility of the Contractor to remove all debris that is located within the sewer pipe. The Contractor is responsible for the disposal of all debris removed from the sewers during the cleaning operation per Standard Specifications 027604.

5.1.4 Pre-Installation Inspection: Inspection of sewer pipe shall be performed by experienced personnel trained in locating breaks, obstacles and service connections by closed circuit television inspection. The interior of the pipe shall be carefully inspected to determine that the line is free any conditions which may prevent proper installation of the CIPP. A videotape and log per Standard Specifications 027610 shall be submitted to the Engineer prior to installation.

- 5.1.5 Bypassing Sewage: The Contractor shall provide for continuous sewage flow as necessary. The bypass shall be made by plugging the line upstream and pumping the flow into a downstream manhole or adjacent system. The pump and bypass lines shall be of adequate capacity and size to handle the flow. Discharge into storm sewer shall not be allowed.
- 5.1.6 Point Repairs & Line Obstructions: It shall be the responsibility of the Contractor to clear the line of obstructions such as solids, roots protruding service or other obstruction that would impeded flow thru the CIPP. Displaced joints, missing portions of pipe or other occurrences that may not be rectified by [Thru-the-Pipe] methods shall be repaired as a [Point Repair], when directed by the Engineer. The Contractor shall make a point repair excavation to uncover and remove or repair the obstruction. ASTM C76 Class IV, Wall B, reinforced concrete pipe shall be used as a host replacement pipe for the CIPP. Approved point repair shall be considered as a separate pay item as indicated on the proposal. Repairs will be paid for by unit price bid regardless of line size or depth up to 16 feet in length, and will include all necessary excavation, dewatering, pavement repair, backfill, traffic control, and any and all work required to complete the point repair. Any authorized additional length of pipe to be repaired during the point repair in excess of 16 feet shall be measured by the linear foot and paid for at the price bid per linear foot for [Extra Length for Point Repairs].
- 5.1.7 Service: The Contractor shall maintain continuous service without disruptions.
- 5.1.8 Public Notification: A public notification program shall be implemented and shall, as a minimum, require the Contractor to be responsible for contacting each home or business connected to the sanitary sewer and informing them of the work to be conducted, and when the sewer will be off-line. The Contractor shall provide the following:
- 5.1.8.1 Written notice to be delivered to each home or business describing the work, schedules, how it affects them, and a local telephone of the Contractor they can call to discuss the project or any problems which could arise.
- 5.1.8.2 Personal contact and attempted written notice the day prior to the beginning of work being conducted on the section relative to the residents affected.
- 5.1.8.3 Personal contact with any home or business which cannot be reconnected within the time stated in the written notice.

## 6. INSTALLATION PROCEDURES

- 6.1 Wet-Out: The Contractor shall identify the location where the tube will be impregnated ([wet-out]) with resin using distribution rollers and vacuum to saturate the tube felt fiber thoroughly prior to installation. The Contractor shall allow the qualified factory field service engineer and Construction Engineer to inspect the materials and wet-out procedure at the designated location. A catalyst system or additive compatible with the resin and the tube shall be used. The amount of resin used for tube impregnation shall be sufficient to fill the volume of air voids in the tube with additional allowances for polymerization shrinkage and the loss of resin through cracks and irregularities in the original pipe wall. Handling of the resin-impregnated flexible tube to prevent resin setting until it is ready for insertion and during installation shall be the responsibility of the Contractor.

A vacuum impregnation process shall be used. To insure a thorough wet-out, the point of vacuum shall be as recommended by the manufacturer and per ASTM F1216.

- 6.2 Insertion: The wet-out tube shall be inserted through an existing manhole or other approved access by means of an inversion or pull-in process and the application of a water column sufficient to fully extend it to the next designated manhole or termination point. The tube end shall initially be turned inside out and attached to a platform ring or standpipe. The inversion water column will be adjusted to be of sufficient height to cause the impregnated tube to invert from manhole-to-manhole and hold the tube tight against the existing pipe wall, to produce dimples at side connections, and flared ends at the manholes.

If the pull-in method is used, the primary (impregnated) liner is towed into the host pipe through the existing manhole with a cable winch. The primary liner shall be floated into place virtually eliminating stresses on the material. Proper lubrication may be needed for longer and thicker liners. The secondary liner should then be inverted with the column of water to inflate the primary liner. This may extrude small amount of resin through the perforations of the outer coating of the primary liner. For the pull-in method, insertion of the new liner shall in no case exceed 800 linear feet.

- 6.3 Curing: After the insertion is completed, the Contractor shall supply a suitable heat source and water recirculation system capable of delivering hot water uniformly throughout the section to effect a consistent cure of the resin. The curing temperature shall be that recommended by the resin/catalyst system manufacturer and shall be maintained at such temperature. The Contractor shall follow a schedule to cure the liner and submit the schedule to the Engineer. The heat source shall be fitted with suitable monitors to gauge the temperature of the incoming and outgoing water supply. Another such gauge shall be placed between the impregnated tube and the invert of the original pipe at the manhole(s) to determine the temperature during the resin curing process. The Contractor shall continue uninterrupted heating until the desired temperature is achieved, shall accurately measure temperatures at both ends of the pipe and maintain a curing log of CIPP temperatures at the upstream and downstream manholes during curing to document that proper temperatures and cure times have been achieved.

Initial cure shall be considered completed when the exposed portions of the CIPP appear to be hard and the remote temperature sensing device indicates the cure period to be of adequate duration as recommended by the resin/catalyst system manufacturer and modified for the inversion process.

- 6.4 Cool-Down: The Contractor shall cool the hardened CIPP to a temperature below 100 degrees Fahrenheit before relieving the water column. Cool water may be added to the water column while draining hot water from a small hole at the opposite end of the CIPP so that a constant water column height is maintained until cool-down is completed. Care shall be taken in the release of the water column so that a vacuum will not be developed that could damage the newly installed CIPP. Do not discharge water in excess of 100 degree Fahrenheit into the sanitary sewer system.

- 6.5 Warranty: The finished CIPP shall be continuous over the entire length of an inversion run and be free from visual defects such as foreign inclusions, dry spots, pinholes, lifts and delamination. It shall also meet the leakage requirements or pressure test specified below. The finished CIPP shall be warranted for one year after the acceptance of the Project. During the warranty period any defects which will affect the integrity or strength of the CIPP shall be repaired at the Contractor's

expense in a manner mutually agreed to by the City and the Contractor.

#### 7. SEALING OF MANHOLES

If the CIPP fails to make a tight seal at a manhole, the Contractor shall apply a seal at that point. The seal shall be of a material compatible with the CIPP material. Do not leave any annular gaps. Seal the annular space with a 1/2 inch diameter activated Oakum band soaked in chemical sealant. Seal any annular spaces greater than 1/2 inch with manhole wall repair material. Finish off the seal with a non-shrink all solids epoxy placed around the pipe opening from inside the manhole in a band at least 4 inches wide. Complete the sealing procedure for each liner segment immediately after the liner is cured.

#### 8. SERVICE CONNECTIONS

After the CIPP has been cured in place, the Contractor shall reopen the existing active service connections as designated by the Engineer. This shall generally be done without excavation, and in the case of non-man entry pipe, from the interior of the pipeline by means of a television camera and a robotic cutting device that reestablishes the service connection to not less than 100% capacity. Cutting devices that use high pressure water shall not be used since they may cause damage to the service. When fiberglass or other reinforcing fibers are used, that may cause wicking at service openings, the service opening edges must be sealed with a resin mixture compatible with the tube resin. The Contractor shall certify he has a minimum of two complete working cutter units plus spare key components on the site before each insertion. No additional payment will be made for excavations for the purpose of reopening connections and the Contractor will be responsible for all costs and liability associated with such excavation and restoration work.

#### 9. TESTING

- 9.1 Chemical Resistance: The CIPP shall meet the chemical resistance requirements of ASTM F 1216, Appendix X2. The test specimens shall be capable of exposure for a minimum of one month at a temperature of 73.4°F. During this period the CIPP test specimens should lose no more than 20% of their initial flexural strength and flexural modulus when tested in accordance with Section 8 of ASTM F1216. In Appendix X2, Table X2.1 presents a list of chemical solutions that serve as a recommended minimum requirement for the chemical-resistant properties of CIPP in standard domestic sanitary sewer applications. CIPP samples for testing shall be of tube and resin system similar to that proposed for actual construction. It is required that CIPP samples with and without plastic coating meet these chemical testing requirements.
- 9.2 Leakage Testing: The water leakage testing of the CIPP shall be tested using an exfiltration test method, when directed by the Engineer. This test shall be in accordance with ASTM F 1216, 8.2.
- 9.3 Wall Thickness Test: This thickness shall be measured in accordance with ASTM D 2122.
- 9.4 Samples: Per ASTM F 1216. 8.1, the preparation of two CIPP samples is required for each insertion segment. One sample from each of the following two methods:
- 9.4.1 The sample should be cut from a section of cured CIPP at an intermediate manhole or at the termination point that has been inverted or pull-in through a like diameter pipe which has been held in place by a suitable

heat sink, such as sandbags.

- 9.4.2 The sample should be fabricated from material taken from the tube and the resin/catalyst system used and cured in a clamped mold placed in the downtube when circulating heated water is used and in the silencer when steam is used.
- 9.4.3 The samples for each of these cases should be large enough to provide a minimum of three specimens and a recommended five specimens for flexural testing and also for tensile testing, if applicable. The Short-term Flexural (Bending) Properties testing should be in accordance with Test Methods ASTM D 790 and shall have a minimum flexural modulus of 250 ksi and a minimum tensile strength of 2500 psi.
- 9.4.4 The samples taken for the measurement of the liner thickness shall be as described in this Specification, section 9.3.

#### 10. CLEAN-UP

Prior to acceptance, the Contractor shall clean and restore the project area affected by these operations.

#### 11. PATENTS

The insertion process is patented and is installed by licensed Contractors. The Contractor shall warrant to the City and his Engineer that the methods, materials and equipment used herein, where covered by license is furnished in accordance with such license and the prices included on this proposal include applicable royalties and fees in accordance with such license. The Contractor shall warrant and save harmless the City and his Engineer against all claims for patent infringement and any loss thereof.

#### 12. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, Cured-In-Place Pipe for rehabilitation shall be measured and paid for by the linear foot, for each size (Nominal Diameter DR, and Height of cover over host pipe) specified, complete in place. If the liner pipe is installed "through" manholes, the liner will be measured and paid for based on the actual line distance between centers of upstream and downstream manholes. If the liner pipe is not installed completely through manholes, such as in the case of changes in pipe alignment or changes in pipe size, the liner will be measured and paid for based on the actual line distance from inside face of an upstream manhole wall to inside face of a downstream manhole wall.

Unless indicated otherwise in the Proposal, Point repairs for CIPP shall be measured as individual units for each size point repair made, regardless of depth and shall include but not be limited to, excavating, dewatering providing, placing, bedding 16 LF of host pipe, backfill, traffic control, surface restoration and all labor, materials and incidentals to complete the work at the unit price bid. Additional length of repair over 16' will be measured as extra length for - diameter point repair.



SECTION 027616  
PROFILED WALL HIGH DENSITY POLYETHYLENE PIPE FOR SLIPLINING (S-73)  
(Gravity Sewers)

1. SCOPE

This specification shall govern for all work necessary for furnishing and installing profiled wall, high density polyethylene pipe required to complete the sliplining of existing sanitary sewer lines.

2. MATERIALS

- 2.1 This profiled wall pipe shall be Spirolite Core Wall as manufactured by Spiral Engineered Systems, a Division of Gulf Plastic Fabricated Products Company, or approved equal.

Polyethylene: The material used for the liner and for the service taps shall be the same materials as designated below.

ASTM Designation: D 3350 with a cell classification of PE345434C. In addition, The liner shall be manufactured of polyethylene resins classified as Type III, Class C, Category 5 Grade P34 as tabulated in specifications in the older ASTM Designation, D1248. This material shall also conform to the design criteria as specified in Plastic Pipe Institute (PPI) Designation: PE3408.

If requested by the owner, the pipe and fitting manufacturer shall provide certified copies of the quality control data taken during product manufacture.

Pipe and fittings shall be produced by the same manufacturer from identical materials meeting the requirements of this specification.

Pipe and fittings shall be rated to meet the service requirements specified by the Design Engineer. Whether molded or fabricated, fittings shall be fully rated to at least the same service rating as the pipe to which joining is intended.

Fitting shall be manufactured in production facilities designed for that purpose. Field fabricated fittings are not allowed.

Pipe and fittings shall be manufactured in accordance with ASTM F894, or the applicable dedicated service specification. Printline markings shall include a production code from which the location and date of manufacture can be identified. Upon request, the manufacturer shall provide an explanation of his production code.

Gaskets shall meet the requirements of ASTM F477.

The Corewall pipe shall have a ring stiffness class of 160.

- 2.2 Pipe Rating: The pipe shall have a manufacturer's recommended hydrostatic design stress rating of at least 800 psi based on a material with a 1600 psi design basis determined in accordance with ASTM D2837-69, Standard Method for Obtaining Hydrostatic Basis for Thermoplastic Pipe Materials.

2.3 Dimensions:

<u>Sewer Line I.D. (Inches)</u>	<u>Nominal O.D. of Liner (Inches)</u>	<u>Min. Wall Thickness Liner (Inches)</u>
60	58.56	2.280
54	52.30	2.150
48	46.05	2.025

Laying length of joints shall be 20' feet plus or minus 2 inches.

The Contractor shall specifically note the relatively small size of the annular space between the liner pipe proposed under this material option. By submitting a bid based on this material option, the Contractor is indicating that sliplining under these conditions is entirely feasible, and assumes all responsibility for any difficulties encountered resulting from these conditions.

2.4 Liner Diameter: The inside diameter of the liner pipe at any point shall not vary from the normal inside diameter by more than one percent or one quarter inch, whichever is greater.

2.5 Wall Thickness: The average wall thickness of the liner pipe shall not be less than the nominal wall thickness published in the manufacturer's literature current at the time of purchase and the wall thickness at any point shall not vary from the nominal by more than 10 percent. The manufacturer shall provide sufficient data to demonstrate that the pipe supplied provides a 50 year service life with a maximum external hydrostatic pressure of 10 feet of water above the pipe center line.

All pipe shall be homogenous throughout, and shall be free of visible cracks, holes, foreign materials, blisters, or other deleterious faults. All materials shall be of the highest quality and highest performance. It shall be the product of a manufacturer of said materials.

3. CONSTRUCTION METHODS

3.1 Cleaning: All lines to be relined shall be cleaned prior to installation of liner. The Contractor shall select the method of cleaning. All materials resulting from the cleaning operations shall be removed at the downstream manhole of the section being cleaned.

Television Inspection: Upon completion of the cleaning operation and prior to insertion of the liner material, and closed circuit television inspection will be performed in accordance with Standard Specification S-125.2.2.

All observed obstructions shall be removed by the Contractor before initiating liner insertion. All excavation and backfilling for removal of obstructions, liner insertions, manhole rehabilitation and side sewer connection, if any, shall conform to requirements set out in this specification.

3.2 Bypass sewage: It shall be the responsibility of the Contractor to bypass the sewage, if necessary, around the section or sections of line that are to be sliplined. Under no circumstances will dumping

of raw sewage of private or City property be allowed. Bypass shall be made by pumping the sewage into a downstream manhole or adjacent system, or other methods as may be approved by the Owner and the Engineer. The pump and bypass line shall be of adequate capacity to handle the flow. If bypass pumping is not a continuous operation, flow through the sewer line shall be restored at the end of a work day. Complete plugging of the existing line will not be permitted unless adequate bypass capacity for anticipated flows is provided or other means of handling the flows is approved by the Engineer.

- 3.3 Pipe jointing: All jointing of pipe sections is to be done in strict conformance with the manufacturer's recommendations.
- 3.4 Insertion: After completing the access shaft excavation, the half of the existing sewer down to the spring line shall be broken or cut and removed for the full length of the access shaft. Precautions shall be taken not to damage the liner by scoring on a ragged edge of the old sewer line during sliplining. wherever possible, liner shall be pushed, jacked, or pulled through manholes and liner sections shall be joined in pits other than in manholes. The purpose of this requirement is to : 1) provide a smooth invert without grouting and a uniform condition for manhole rehabilitation; and, 2) minimize the number of insertion pits. Details for joining of liner section in manholes shall be submitted to the Engineer for approval prior to construction. Sufficient time (minimum 12 hours) shall be allowed after pushing, jacking, or pulling the pipe for the pipe to recover to its original length, and allow for stabilization of length due to temperature. During the installation of the liner, should the liner break or separate, the excavation required to rejoin the pipe and all other work necessary to complete such repair shall be done for no separate pay.
- 3.5 Service Connections: After the liner has been pushed, jacked, or pulled into place, allowed to recover, and secured to the manhole walls, each side sewer service shall be connected to the new liner, Service laterals shall be connected by the use of an approved remote tapping system or a prefabricated saddle. If the prefabricated saddle is use, a neoprene gasket shall be installed between the saddle and the liner pipe so that a complete water seal is accomplished when the two piece saddle is place around the polyethylene pipe and pulled together with stainless steel bands. Inspection of this line did not reveal any connections to the sewer except at manholes. Laterals connecting to existing manholes shall be reconnected to the satisfaction of the Engineer.
- 3.6 Backfill: At all pints where the liner pipe has been exposed, as in access shafts, outside of manholes, service connections, etc., the Contractor shall remove all debris and create a void along each side of the pipe at the spring line to undisturbed soil. Width of the void shall not exceed existing pipe O.D. plus four feet. Suitable spacers shall be used to center the liner within the existing pipe, or hold the liner at the top of the existing pipe. The space between the liner and the pipe shall be filled with cement grout which shall contain a minimum of seven sacks of cement per cubic yard of sand and enough water (but no more) to provide a mixture that will flow around the pipe. As the bottom portion of this grout begins to set up, a drier mix shall be placed on top of the liner until a cover over the liner approximately the O.D. of

the existing pipe is formed. In the voids along each side of the existing pipe, the Contractor shall place cement stabilized sand consisting of 3 sacks of Portland Cement per cubic yard of fine aggregate for concrete, mixed dry and placed in six inch lifts for the full width and length of the excavation and also be placed over the above described grout until a depth of twelve inches over the top of the original pipe is achieved. Each lift shall be hand tamped and utmost care shall be exercised to avoid damaging the stabilized sand is in place and accepted by the Engineer, backfilling to finished grade may be completed using material from the excavation, select material or cement stabilized sand, all at the Contractor's option and as approved by the Engineer.

- 3.7 Sealing Manholes: The annular space between the polyethylene liner and the existing sewer line shall be sealed where the sewer line enter or exits each manhole. The annular space may be sealed with a mechanical device, chemical seal, or quick setting concrete. The method chosen shall be approved by the Engineer prior to construction.
- 3.8 Grouting Annular Space: The annular space between the polyethylene liner and the existing pipe shall be filled with a grout having good flow characteristics, minimum shrinkage, and permanence of support. The grout mix used shall have a minimum 24 hour compressive strength of 25 psi and a minimum 28 day compressive strength of 200 psi. Exact grout mix designs and details of proposed grouting methods shall be submitted to the Engineer for approval prior to use on the project. It is intended that the annular space be 100% filled, but particular attention must be paid to those areas just downstream of manholes to avoid air traps. Equipment for placement of grout shall be used as to prevent segregation of the grout components and to cause the grout to flow around the liner and completely fill the voids in the annular space. Under no circumstances shall grout be dropped down the shafts onto the polyethylene liner. Grouting pressures shall not exceed the limits established by the liner pipe manufacturer. Such limits shall be adjusted to allow for higher temperatures caused by hydration of the grout mix. The Contractor shall have operable pumps on the job site to remove water for the vertical shafts as it is displaced by grout to prevent an excessive hydrostatic head on the polyethylene liner.
- 3.9 New Manholes: In those places where the main access shaft is excavated at an existing manhole, the manhole will be replaced with a new manhole. The new manhole shall essentially be equal to the rehabilitated manhole shown on the drawings except that a concrete vault will not have to be constructed at the bottom. Details of such construction shall be subject to review and approval by the Engineer before construction. All materials shall be new and the best quality and workmanship shall be that of skilled craftsmen. New manholes constructed under this section shall not be reason for extra compensation. All materials not used in the backfilling operation shall be disposed of off site by the Contractor and all areas must be restored to their original conditions.
- 3.10 Inspection of Completed Work: A final closed circuit television inspection in accordance with Standard Specification S-125.2.3 will be required upon completion of trunkline and manhole rehabilitation operations. It is the intent of the plans and specifications that the entire length of the completed trunkline rehabilitation be

inspected, however, the Contractor shall have the option of performing final inspection of sections of the trunkline as completed. The time, location, and length of final inspections shall be as approved by the Engineer.

#### 4. CLEANUP

After all installation work has been completed, the Contractor shall cleanup the area around the work area and return the ground cover to a like or better condition as existed prior to construction. All pavement shall be repaired as specified. All broken pipe, and other material not a part of the ground cover shall be hauled off and properly disposed of the Contractor.

#### 5. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, Sanitary Sewer Sliplining will be measured by the linear foot for each size installed.

SECTION 027618  
SANITARY SEWER REHABILITATION / PIPEBURSTING (S-75)

1. SCOPE

This specification shall govern all work necessary to rehabilitate gravity sanitary sewer lines by pipebursting, wherein a horizontal boring technique, utilizing a cutting/expansive tool head fragments the existing pipe, and a fusion welded, high density polyethylene pipe is drawn into the resulting tunnel.

2. MATERIALS

2.1 Polyethylene:

ASTM Designation: D-3350 with a cell classification of 335434B D or E (with inner wall of light colour). In addition, the liner shall be manufactured of polyethylene resins classified as Type III, Class C, Category 5, Grade P34, as tabulated in specifications in the older ASTM Designation, D-1248. This material shall also conform to the design criteria as specified in Plastic Pipe Institute (PPI) Designation: PE3408.

2.2 Dimensions: The pipe shall be (SDR 17, IPS) per ASTM F714 of the nominal diameter as shown on the plans and specified in the proposal.

2.3 Quality: All pipe shall be homogenous throughout, and shall be free of visible cracks, holes, foreign materials, blisters, or other deleterious faults. All materials shall be of the highest quality and highest performance. It shall be the product of a manufacturer actively engaged in research, development, and the manufacturer of said materials.

3. CONSTRUCTION METHODS

3.1 Pipe Jointing: Sections of the polyethylene (PE) liner pipe shall be joined by the butt-fusion method and performed in strict conformance with the pipe manufacturer's recommendations using approved equipment. The Contractor shall make arrangements to have a technical representative of the pipe manufacturer present for the start-up of the butt-fusion jointing and training of the contractor's personnel, or arrangements shall be made for the pipe manufacturer's representative to remain on the job until all jointing has been completed. When requested by the Engineer, samples of butt-fusion joints shall be furnished by the contractor for laboratory testing. The test of such samples shall clearly demonstrate joint integrity, strength, etc.

3.2 Insertion Pits: The location and number of insertion pits shall be determined by the contractor to maximize insertion lengths and keep the number of excavations to a minimum. The insertion pit size shall be the minimum necessary to perform insertion operations. Locations of insertion pits shall be acceptable to the Engineer.

Removal of obstructions and point repairs shall be done as necessary. This work shall be done in accordance with Excavation and Backfill for Utilities and Sewers 022020 of the Standard Specifications.

3.3 Pulling Pipe: New polyethylene pipe shall be pulled immediately behind the pipe bursting equipment in accordance with the manufacturer's procedures. The machine shall be specifically designed and manufactured for the pipe insertion process.

The Contractor shall install all pulleys, rollers, bumpers, alignment control devices, and other equipment, required to protect existing manholes, and to protect the pipe from damage during installation. Lubrication may be used as recommended by the pipe manufacturer. Under no circumstances shall the pipe be stressed beyond 50%

of its tensile strength at yield, that being 22,600 lb. For an 8" SDR 17 pipe. Provide a suitable pull measuring device connected to the winch or pulling system.

Upon commencement, insertion shall be continuous without interruption, if possible.

Terminal sections of pipe that are joined within the insertion pit shall be connected with a 1/4" thick neoprene gasket and a stainless steel band clamp having a minimum of 4 bolt/nut drawn down fixtures. The butt gap between pipe ends shall not exceed 1/2".

The installed pipe shall be allowed the manufacturer's recommended amount of time, but not less than 24 hours, for relaxation prior to any reconnection of service lines, sealing of the annulus, or backfilling the insertion pit. Sufficient excess length shall be allowed to provide for this occurrence.

3.4 Service Connections: All service connections shall be identified, excavated, and disconnected prior to pipe bursting. After the new main has been pulled into place, allow to recover, and secure to the manholes walls, each service shall be connected to the new main. Services shall be connected by the use of an approved pre-fabricated saddle. The pre-fabricated saddle shall be equipped with a neoprene gasket installed between the saddle and the liner pipe so that a complete water seal is accomplished when the two-piece saddle is placed around the polyethylene pipe and pulled together with stainless steel bands. Drill hole in main shall be flush with the inside diameter of the saddle. Continuous service shall be maintained.

3.5 Annulus Sealing: The relaxed pipe shall be cut 4" inside of manholes and any annular space sealed. The annular space may be sealed with a mechanical device, chemical seal, or quick-setting concrete. The method chosen shall be approved by the Engineer prior to construction. The sealant shall extend at least 8-inches past the outside of the manhole wall. The sealant shall form a smooth transition above the liner projection into the manhole. The sealant shall be applied 3" beyond the annulus on the inside wall of the manhole. The complete joint shall be uniform and water-tight.

3.6 Backfill: The insertion pit(s) shall be backfilled with an approved granular material from the invert to a minimum of 12" above the pipe. The balance of the insertion pit may be backfilled using approved material taken from the excavation. All backfilling shall be accomplished in such a manner as to achieve a 95% standard proctor density.

3.7 By-Pass Sewage: It shall be the responsibility of the contractor to maintain continuous flow of sewage, during execution of work. This includes flow of all mains, laterals and services. Pumps and by-pass lines shall be of adequate capacity to handle all flows. Dumping of raw sewage on private or city property shall not be allowed. By-pass shall be made by pumping the sewage into the downstream manhole or adjacent system, or other methods as may be approved by the owner and the Engineer.

#### 4. DELIVERY, STORAGE AND HANDLING OF MATERIALS:

The Contractor shall be responsible for all handling and security of the materials.

#### 5. CLEANUP:

The Contractor shall clean up the area around the work area and restore surface improvements to a like or better condition as existed prior to construction. All pavement shall be repaired as specified. All broken pipe and other unwanted material shall become property of the Contractor and hauled off and disposed by the Contractor.

#### 6. TELEVISION INSPECTION:

Television inspection of pipeline shall be performed by experienced personnel. Television inspection shall be per the following:

Post Construction video tape of each sewer shall include voice description and stationing of each service indicated. Data and stationing shall be visually displayed on video.

By-pass or diversion of flow shall be done by the Contractor as necessary to obtain acceptable video.

If any portion of the inspection tapes be deemed inadequate by the City, the Contractor shall re-tape that portion to the satisfaction of the City at no additional expense to the City. Tapes of all work shall be furnished to the City prior to acceptance of work. One copy shall become property of The City and retained by the City.

7. TESTING:

After the proposed line has been completed, internally inspect with video camera and video tape as required. Tape shall be furnished to the City prior to acceptance of work.

Manholes and services are to be tested as described elsewhere.

8. MEASUREMENT AND PAYMENT:

Unless indicated otherwise in the Proposal, Sanitary Sewer Rehabilitation / Pipebursting will be measured by the linear foot for each size installed. Measurement shall include, but not be limited to, all materials, labor, equipment and incidentals require for services, diversion of flow, removal of obstructions (unanticipated or otherwise), trenching, installing the new line, surface restoration, clean-up, video taping, and other work as may be required.



SECTION 027620  
PROFILED WALL POLYVINYL CHLORIDE (PVC) LINER PIPE  
FOR SLIPLINING GRAVITY SEWERS

1. SCOPE

- 1.1 This specification shall govern for all work necessary for furnishing and installing profiled wall, polyvinyl chloride (PVC) pipe required to complete the sliplining of existing sanitary sewer lines. This pipe and associated fittings shall be made to a controlled inside diameter and shall meet the requirements of ASTM F 794-93a, closed profile.
- 1.2 The liner pipe conforming to these specification requirements shall be furnished in classes designated as "gravity," intended to operate at up to 25 psig internal pressure, and shall be designed to convey sewage flows with a pH range between 3 and 11, inclusive. This liner pipe shall be designed to operate under the conditions described above for the design service life of the liner pipe (50 years).

2. MATERIALS

- 2.1 This profiled wall pipe shall be as manufactured by Lamson Vylon Pipe Company, or approved equal.
- 2.2 The liner pipe and any fittings required shall be made from polyvinyl chloride compounds which comply with the requirements for a minimum cell classification of 12364A as defined by ASTM D-1784.
- 2.3 If requested by the owner, the pipe and fitting manufacturer shall provide certified copies of the quality control data taken during product manufacture.
- 2.4 Pipe and fittings shall be produced by the same manufacturer from identical materials meeting the requirements of this specification.
- 2.5 Pipe and fittings shall be rated to meet the service requirements specified by the Engineer. Whether molded or fabricated, fittings shall be fully rated to at least the same service rating as the pipe to which joining is intended.
- 2.6 Fittings shall be manufactured in production facilities designed for that purpose. Field fabricated fittings are not allowed.
- 2.7 Pipe and fittings shall be manufactured in accordance with ASTM F 794-93a, or the applicable dedicated service specification. Printline markings shall include a production code from which the location and date of manufacture can be identified. Upon request, the manufacturer shall provide an explanation of his production code.
- 2.8 The gaskets used with this pipe shall conform to the requirements of ASTM F-477, "Specifications for Elastomeric Seals (Gaskets) for Joining Plastic Pipe." Gasket material shall be elastomer with a chemical resistance equal to or better than that of Ethylene Propylene Copolymer and Terpolymer (EPDM) to the following:

Bleach Solutions  
Chlorine  
Detergent Solutions  
Ferric Sulfate

Hydrogen Sulfide  
Sewage  
Soap Solutions  
Sulfuric Acid (Dilute)  
Vegetable Oils

2.9 All pipe joints shall conform to the requirements of ASTM D-3212.

3. PHYSICAL REQUIREMENTS

- 3.1 The minimum pipe stiffness for the sliplining pipe furnished under this specification shall be 46 psi when tested in accordance with ASTM D-2412.
- 3.2 No visual cracking or splitting of the waterway wall of the pipe shall be evidenced when tested in accordance with ASTM D-2444 with a 30 lb. weight, to a level of 220 ft. lbs.
- 3.3 There shall be no sign of flaking or disintegration of the liner pipe when immersed in anhydrous acetone for 20 minutes as described in ASTM D-2152.
- 3.4 There shall be no evidence of cracking or splitting when the liner pipe is flattened in a circumferential orientation between two flat plates to 60% of the original inside diameter.
- 3.5 Each length of slipliner pipe shall pass a factory air test of 3.5 psi as described in ASTM F 794-93a.

4. DIMENSIONS AND PERMISSIBLE VARIATIONS

4.1 The nominal size of liner pipe furnished for this project shall meet the following requirements:

<u>Exist Sewer Line Nominal Dia. (Inches)</u>	<u>Minimum O.D. of Liner (Inches)</u>	<u>I.D. of Liner (Inches)</u>
24	20.00	18.00

- 4.2 The typical laying length of each liner pipe section shall be 15 feet, plus or minus 1 inch. Where existing line conditions warrant, 10 foot lengths, plus or minus 1 inch, will also be allowed with the approval of the Engineer.
- 4.3 The Contractor shall specifically note the relatively small size of the annular space anticipated between the existing line and the liner pipe proposed under this material option. By submitting a bid based on the material option, the Contractor is indicating that sliplining under these conditions is entirely feasible, and assumes all responsibility for any difficulties encountered resulting from these conditions.
- 4.4 The inside diameter of the liner pipe at any point shall not vary from the normal inside diameter by more than one percent or one quarter inch, whichever is greater.
- 4.5 The average wall thickness of the liner pipe shall not be less than the nominal wall thickness published in the manufacturer's literature current at the time of purchase and the wall thickness at any point shall not vary from the nominal by more than 10 percent. The manufacturer shall provide sufficient data to demonstrate that the pipe supplied provides a 50-year

service life with a maximum external hydrostatic pressure of 10 feet of water above the pipe center line.

#### 5. WORKMANSHIP, FINISH AND APPEARANCE

- 5.1 All pipe shall be homogenous throughout, and shall be free of visible cracks, holes, foreign materials, blisters, or other deleterious faults. All materials shall be of the highest quality and highest performance. It shall be the product of a manufacturer of said materials.
- 5.2 Joint sealing surfaces shall be free of dents or gouges that will affect the integrity of the joints.

#### 6. CONSTRUCTION METHODS

##### 6.1 General

The Contractor shall provide all necessary insertion/work pits or shafts as required to complete the proposed sewer rehabilitation. The location of any access pits or shafts shall be subject to the approval of the Engineer. The number of access pits or shafts shall be kept to a minimum.

The size of access pits or shafts shall be kept to the minimum necessary for proper insertion of the liner pipe. All pits shall be constructed with properly applied vertical side support, etc., in accordance with applicable OSHA requirements. At access pits, or other points where the liner pipe is exposed, the Contractor shall encase the liner as detailed in the plans.

Pipe and any required fittings shall be stockpiled in safe manner at each Contractor staging area or insertion/work pit location. The stockpiling shall be arranged so as to cause a minimum of interference to pedestrian and vehicular traffic. No stockpiling will be permitted on the opposite side of the street from the construction area without prior approval of the Engineer. When handling liner pipe, the Contractor shall take all precautions necessary to avoid damage to the pipe. Dragging of the pipe over sharp objects shall be avoided. Pipe with deep cuts, cracks, scratches, or gouges shall be rejected and replaced.

##### 6.2 Cleaning

All lines to be rehabilitated shall be cleaned prior to the installation of the liner. The Contractor shall select the method of cleaning, and shall submit details for accomplishing same to the Engineer for approval prior to beginning cleaning operations. The Contractor shall take such precautions as necessary to protect the existing line from further damage during the cleaning process and shall be responsible for repairing any such damages. The Contractor shall remove all materials resulting from the cleaning operations at the downstream manhole or insertion/work pit of the section being cleaned, and shall take whatever precautions necessary to prevent any migration of material into the line downstream from that point. It is the intent of the plans and specifications that all sludge and/or debris within the existing line be removed. The definition of "all" in this context will be interpreted as the removal of any and all sludge or debris that would interfere with the proper installation of the liner pipe as determined by the liner pipe manufacturer or the Engineer. In no case shall the amount of sludge or debris remaining within the existing line be such as to result in more than a one inch depth of water being ponded upstream of the remaining sludge or debris.

### 6.3 Initial Television Inspection

Upon completion of cleaning operations and prior to insertion of the liner material, a closed circuit television inspection will be performed in accordance with Standard Specification 027900.2.2. In particular, the interior of the existing main shall be carefully inspected to determine the location and extent of any condition which may prevent proper installation of lining materials, as well as to confirm those cleaning operations have been completed in accordance with paragraph 6.2 above.

All observed obstructions or other line conditions which may interfere with liner installation shall be removed or otherwise corrected by the Contractor before initiating liner insertion.

### 6.4 Maintenance of Existing Sewer Flows

The Contractor shall make all necessary arrangements and provide all necessary equipment to maintain sewage flows at all times. This shall be accomplished by allowing flows to pass around and through the liner pipes or by other means acceptable to the Engineer. The Contractor will be responsible for any necessary bypassing of sewage around the section or sections of line to be sliplined. Under no circumstances will dumping of raw sewage on private or City properties are allowed. Bypassing shall be made by pumping the sewage into a downstream manhole or adjacent system, or other methods as may be approved by the Engineer. The pump and bypass line shall be of adequate capacity to handle the existing flow, as well as any anticipated peak or surcharge flow. If bypass pumping is not a continuous operation, flow through the sewer line shall be restored at the end of each work day. Complete plugging of the existing line will not be permitted unless adequate bypass capacity for anticipated flows is provided or other means of handling the flows is approved by the Engineer.

### 6.5 Liner Pipe Installation

Liner pipe grade shall be maintained equal to the grade of the sewer being relined. At times when work is not in progress for whatever reason, open ends of pipe or fittings shall be protected.

Pipe shall not be installed if the condition of the existing sewer line is unsuitable or if the weather is such that anticipated sewer flows will be such that would interfere with proper insertion operations.

The Contractor shall be responsible for and take all necessary precautions to ensure that no liner pipe flotation, adverse pipe grades, or pipe rotation about the vertical axis results, or collapse of the liner pipe occurs during insertion or grouting operations. Multiple low pressure grout lifts are recommended. Grouting shall be in accordance with Section 027620.6.7.

Within the insertion pit, the top half of the exposed existing pipe is to be removed to the springline. The bottom half is to be left in place where it shall serve as a cradle for the liner pipe. The liner pipe shall be either jacked, pushed, or pulled into the existing pipe as determined by the Contractor. The Contractor shall take adequate precautions to ensure that liner pipe sections are not damaged by scoring or cutting on ragged edges of the existing pipe. An aqueous solution of bentonite may be used as a lubricant to minimize insertion loads. A tapered guide may be attached to the leading end of each section to be installed to help the liner pipe clear small obstructions. A jacking ring or other means shall

be used to distribute load as per manufacturer's recommendations for installation of the liner pipe.

Pipe jointing shall be carried out in strict accordance with the manufacturer's recommendations. The Contractor shall provide a suitable means for measuring insertion loads, as approved by the Engineer, and shall monitor the load as the liner pipe is being installed. All gauges or other mechanisms used to monitor jacking loads shall be calibrated prior to use on the project. Documents certifying this calibration shall be furnished to and approved by the Engineer prior to beginning insertion operations. This calibration shall be done no more than six months prior to beginning insertion operations, and shall be considered valid for a period of twelve months from the date of calibration. In the event this twelve months period elapses prior to completing insertion operations on the project, re-calibration of these devices will be required. Total insertion loads shall not exceed the values recommended by the manufacturer. For each section to be lined, insertion shall be one continuous operation until the planned termination point is reached. If at any time the load appears to rise or fall non-uniformly, indicating possible obstruction or failure of the liner pipe, insertion operations shall be terminated immediately, and the liner shall be inspected for damage or obstructions. Any damaged pipe shall be repaired or replaced as approved by the Engineer, and any obstructions removed before resuming insertion operations. After insertion is complete, the Contractor shall allow sufficient time (12 hours, minimum) for any stress/strain due to insertion loading remaining within the liner pipe material to reach equilibrium (allow the pipe to "recover").

Closure in the insertion pit after sliplining operations are complete may be accomplished using a long bell closure kit or other methods, as approved by the Engineer.

#### 6.6 Service/Lateral Line Connections

After the liner pipe has been placed and allowed to recover, any sewer service or lateral lines not entering the existing line at a manhole shall be connected to the new liner pipe using prefabricated tapping saddles as approved by the Engineer.

#### 6.7 Grouting Annular Space

The annular space between the PVC liner and the existing pipe shall be filled with a grout having good flow characteristics, minimum shrinkage, and permanence of support. The grout mix used shall have a minimum 24-hour compressive strength of 25 psi and a minimum 28-day compressive strength of 200 psi. Exact grout mix designs and details of proposed grouting methods shall be submitted to the Engineer for approval prior to use on the project. It is intended that the annular space be 100% filled, but particular attention must be paid to those areas just downstream of manholes to avoid trapped air pockets. Equipment for placement of grout shall not cause segregation of the grout components and shall allow the grout to flow around the liner and completely fill the voids in the annular space. Under no circumstances shall grout be dropped down onto the PVC liner. Grouting pressures shall be monitored by gauges or other means approved by the Engineer, and shall not exceed the limits established by the liner pipe manufacturer. Such limits shall be adjusted to allow for higher temperatures caused by hydration of the grout mix. The Contractor shall have operable pumps on the job site to remove any water displaced by grouting of the annular space.

6.8 Backfill of Access/Work Areas

The Contractor shall backfill all points where the liner pipe has been exposed, such as insertion pits, access shafts, manhole or service connections, etc., in accordance with the details included in the plans.

6.9 Manhole Replacement

In those places where the entrance pit is excavated at an existing manhole, the manhole shall be replaced with a new manhole in accordance with the applicable specifications and details included in the plans and contract documents.

6.10 Inspection of Completed Work

A final closed circuit television inspection in accordance with Standard Specification 027900.2.3 will be required upon completion of trunkline and manhole rehabilitation operations. It is the intent of the plans and specifications that the entire length of the completed trunkline rehabilitation is inspected, however, the Contractor shall have the option of performing final inspection of sections of the trunkline as completed. The time, location, and length of final inspections shall be as approved by the Engineer.

6.11 Clean Up

After work has been completed, the Contractor shall clean up all work areas and restore the ground cover to a condition equal to or better than that existing prior to construction. This shall include restoration of any driveways, sidewalks, street pavements, etc., damaged as a result of construction operations. Any excess pipe, spilled concrete or grout, or other construction related materials shall be removed from the site and properly disposed of by the Contractor. All final clean up will be subject to the approval of the Engineer or his designated representative.

7. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, Profiled Wall Polyvinyl Chloride (PVC) Pipe for Sliplining Gravity Sewers shall be measured and paid for by the linear foot, complete in place. If the liner pipe is installed "through" manholes, the liner will be measured and paid for based on the actual line distance between centers of upstream and downstream manholes. If the liner pipe is not installed completely through manholes, such as in the case of changes in pipe alignment or changes in pipe size, the liner will be measured and paid for based on the actual line distance from inside face of upstream manhole walls to face of downstream manhole walls inside.

SECTION 027624  
SMOOTH WALL POLYVINYL CHLORIDE (PVC) LINER PIPE  
FOR SLIPLINING GRAVITY SEWERS

1. SCOPE

- 1.1 This specification shall govern for all work necessary for furnishing and installing smooth wall, polyvinyl chloride (PVC) pipe required to complete the sliplining of existing sanitary sewer lines. The pipe and the associated fittings shall be made to a controlled outside diameter and shall meet the following American Society of Testing and Materials (ASTM) standard specifications, which are made a part hereof by such reference and shall be latest edition and revision thereof:

ASTM F-789-95a Type PS-46 Poly(Vinyl Chloride) (PVC) Plastic Gravity Flow Sewer Pipe and Fittings

ASTM D-1784 Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds

ASTM D-2412 Determination of External Loading Characteristics of Plastic Pipe by Parallel Plate Loading

ASTM D-3212 Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals

ASTM F-477 Elastomeric Seals (Gaskets) for joining Plastic Pipe

- 1.2 The liner pipe conforming to these specification requirements shall be furnished in classes designated as "gravity," intended to operate at up to 25 psig internal pressure, and shall be designed to convey sewage flows with a pH range between 3 and 11, inclusive. This liner pipe shall be designed to operate under the conditions described above for the design service life of the liner pipe (50 years).

2. MATERIALS

- 2.1 This smooth wall pipe shall be as manufactured by Lamson Vylon Pipe Company, or approved equal.
- 2.2 The liner pipe and any fittings required shall be made from polyvinyl chloride compounds which comply with the requirements for a minimum cell classification of 12364A as defined by ASTM D-1784.
- 2.3 If requested by the owner, the pipe and fitting manufacturer shall provide certified copies of the quality control data taken during product manufacture.
- 2.4 Pipe and fittings shall be provided by the same manufacturer from identical materials meeting the requirements of this specification.
- 2.5 Pipe and fittings shall be rated to meet the service requirements specified by the Engineer. Whether molded or fabricated, fittings shall be fully rated to at least the same service rating as the pipe to which joining is intended.
- 2.6 Fittings shall be manufactured in production facilities designed for that purpose. Field fabricated fittings are not allowed.
- 2.7 Pipe and fittings shall be manufactured in accordance with ASTM F 789-95a, or the applicable dedicated service specification. Printline markings shall include a production code from which the location and date of

manufacture can be identified. Upon request, the manufacturer shall provide an explanation of his production code.

- 2.8 The gaskets used with this pipe shall conform to the requirements of ASTM F-477, "Specifications for Elastomeric Seals (Gaskets) for Joining Plastic Pipe." Gasket material shall be elastomer with a chemical resistance equal to or better than that of Ethylene Propylene Copolymer and Terpolymer (EPDM) to the following:

Bleach Solutions	Chlorine	Detergent Solutions
Ferric Sulfate	Ferrous Sulphate	Hydrogen Sulfide
Methane	Raw Domestic Sewage	Soap Solutions
Sulfuric Acid (Dilute)	Vegetable Oils	

Any adhesives or other materials used to apply the gasket material to the carrier pipe shall meet the same chemical resistance requirements as the gasket material itself.

- 2.9 All pipe joints shall conform to the requirements of ASTM D-3212.

### 3. PHYSICAL REQUIREMENTS

- 3.1 The minimum pipe stiffness for the sliplining pipe furnished under this specification shall be 46 psi when tested in accordance with ASTM D-2412.
- 3.2 No visual cracking or splitting of the waterway wall of the pipe shall be evidenced when tested in accordance with ASTM D-2444 with a 30 lb. weight, to a level of 220 ft. lbs.
- 3.3 There shall be no sign of flaking or disintegration of the liner pipe when immersed in anhydrous acetone for 20 minutes as described in ASTM D-2152.
- 3.4 There shall be no evidence of cracking or splitting when the liner pipe is flattened in accordance with ASTM F-789, section 8.6, in a circumferential orientation between two flat plates to 60% of the original inside diameter.
- 3.5 Each length of slipliner pipe shall meet the requirements of ASTM D-3212.

### 4. DIMENSIONS AND PERMISSIBLE VARIATIONS

- 4.1 The nominal size of liner pipe furnished shall meet the following requirements:

<u>Liner pipe Nominal.Dia.(Inches)</u>	<u>Maximum O.D. of Liner (Inches)</u>	<u>I.D. of Liner (Inches)</u>
18	18.700	17.660

- 4.2 The typical laying length of each liner pipe section shall be 15 feet, plus or minus 1 inch. Where existing line conditions warrant, 10 foot lengths, plus or minus 1 inch, will also be allowed with the approval of the Engineer.
- 4.3 The Contractor shall specifically note the relatively small size of the annular space anticipated between the existing line and the liner pipe proposed under this material option. By submitting a bid based on the material option, the Contractor is indicating that sliplining under these



conditions is entirely feasible, and assumes all responsibility for any difficulties encountered resulting from these conditions.

- 4.4 The inside diameter of the liner pipe at any point shall not vary from the normal inside diameter by more than one percent or one quarter inch, whichever is greater.
- 4.5 The average wall thickness of the liner pipe shall not be less than the nominal wall thickness published in the manufacturer's literature current at the time of purchase and the wall thickness at any point shall not vary from the nominal by more than 10 percent. The manufacturer shall provide sufficient data to demonstrate that the pipe supplied provides a 50-year service life with a maximum external hydrostatic pressure of 10 feet of water above the pipe center line.

#### 5. WORKMANSHIP, FINISH AND APPEARANCE

- 5.1 All pipe shall be homogenous throughout, and shall be free of visible cracks, holes, foreign materials, blisters, or other deleterious faults. All materials shall be of the highest quality and highest performance. It shall be the product of a manufacturer of said materials.
- 5.2 Joint sealing surfaces shall be free of dents or gouges or any other irregularity that will affect the integrity of the joints.

#### 6. CONSTRUCTION METHODS

- 6.1 General: Contractor shall provide all necessary insertion/work pits or shafts as required to complete the proposed sewer rehabilitation. The location of any access pits or shafts shall be subject to the approval of the Engineer. The number of access pits or shafts shall be kept to a minimum.

The size of access pits or shafts shall be kept to the minimum necessary for proper insertion of the liner pipe. All pits shall be constructed with properly applied vertical side support, etc., in accordance with applicable OSHA requirements. At access pits, or other points where the liner pipe is exposed, the Contractor shall encase the liner as detailed in the plans upon the completion of liner installation.

Pipe and any required fittings shall be stockpiled in safe manner at each Contractor staging area or insertion/work pit location. The stockpiling shall be arranged so as to cause a minimum of interference to pedestrian and vehicular traffic. No stockpiling will be permitted on the opposite side of the street from the construction area without prior approval of the Engineer. When handling or stock piling liner pipe, the Contractor shall take all precautions necessary to avoid damage to the pipe. Dragging of the pipe over sharp objects shall be avoided. Pipe with deep cuts, cracks, scratches, or gouges as determined by the engineer shall be rejected and replaced by the contractor at no additional cost.

- 6.2 Cleaning: All lines to be rehabilitated shall be cleaned prior to the installation of the liner. The Contractor shall select the method of cleaning, and shall submit details for accomplishing same to the Engineer for approval prior to beginning cleaning operations. The Contractor shall take such precautions as necessary to protect the existing line from further damage during the cleaning process and shall be responsible for repairing any such damages. The Contractor shall remove all materials resulting from the cleaning operations at the downstream manhole or insertion/work pit of the section being cleaned, and shall take whatever

precautions necessary to prevent any migration of material into the line downstream from that point. It is the intent of the plans and specifications that all sludge and/or debris within the existing line be removed. The definition of "all" in this context will be interpreted as the removal of any and all sludge or debris that would interfere with the proper installation of the liner pipe as determined by the liner pipe manufacturer or the Engineer. In no case shall the amount of sludge or debris remaining within the existing line be such as to result in more than a one inch depth of water being ponded upstream of the remaining sludge or debris.

- 6.3 Initial Television Inspection: Upon completion of cleaning operations and prior to insertion of the liner material, a closed circuit television inspection will be performed in accordance with Standard Specification 027900.2.2. In particular, the interior of the existing main shall be carefully inspected to determine the location and extent of any condition which may prevent proper installation of lining materials, as well as to confirm that cleaning operations have been completed in accordance with paragraph 6.2 above.

All observed obstructions or other line conditions which may interfere with liner installation shall be removed or otherwise corrected by the Contractor before initiating liner insertion. After corrective measures have been completed, the closed circuit television inspection will be repeated as outlined above.

- 6.4 Maintenance of Existing Sewer Flows: The Contractor shall make all necessary arrangements and provide all necessary equipment to maintain sewage flows at all times. This shall be accomplished by allowing flows to pass around and through the liner pipes or by other means acceptable to the Engineer. The Contractor will be responsible for any necessary bypassing of sewage around the section or sections of line to be sliplined. Under no circumstances will dumping of raw sewage on private or City properties be allowed. Any required bypassing shall be made by pumping the sewage into a downstream manhole or adjacent system, or other methods as may be approved by the Engineer. The pump and bypass line shall be of adequate capacity to handle the existing flow, as well as any anticipated peak or surcharge flow. If bypass pumping is not a continuous operation, flow through the sewer line shall be restored at the end of each work day. Complete plugging of the existing line will not be permitted unless adequate bypass capacity for anticipated flows is provided or other means of handling the flows is approved by the Engineer.

- 6.5 Liner Pipe Installation: Liner pipe grade shall be maintained equal to the grade of the sewer being relined. At times when work is not in progress for whatever reason, open ends of pipe or fittings shall be protected.

Pipe shall not be installed if the condition of the existing sewer line is unsuitable or if the weather is such that anticipated sewer flows that would interfere with proper insertion operations.

The Contractor shall be responsible for and take all necessary precautions to ensure that no liner pipe flotation, joint separation, adverse pipe grades, or pipe rotation about the vertical axis results, or deflection, damage, or collapse of the liner pipe occurs during insertion or grouting operations. Multiple low pressure grout lifts are recommended. Grouting shall be in accordance with Section 027620.6.7.

Within the insertion pit, the top half of the exposed existing pipe is to be removed to the springline. The bottom half is to be left in place where it shall serve as a cradle for the liner pipe. The liner pipe shall be either jacked, pushed, or pulled into the existing pipe as determined by the Contractor. The Contractor shall take adequate precautions to ensure that liner pipe sections are not damaged by scoring or cutting on ragged edges of the existing pipe. An aqueous solution of bentonite may be used as a lubricant to minimize insertion loads. A tapered guide may be attached to the leading end of each section to be installed to help the liner pipe clear small obstructions. A jacking ring or other means shall be used to distribute load as per manufacturer's recommendations for installation of the liner pipe.

Pipe jointing shall be carried out in strict accordance with the manufacturer's recommendations. The Contractor shall provide a suitable means for measuring insertion loads, as approved by the Engineer, and shall monitor the load as the liner pipe is being installed. All gauges or other mechanisms used to monitor jacking loads shall be calibrated prior to use on the project. Documents certifying this calibration shall be furnished to and approved by the Engineer prior to beginning insertion operations. This calibration shall be done no more than six months prior to beginning insertion operations, and shall be considered valid for a period of twelve months from the date of calibration. In the event this twelve months period elapses prior to completing insertion operations on the project, re-calibration of these devices will be required. Total insertion loads shall not exceed the values recommended by the manufacturer. For each section to be lined, insertion shall be one continuous operation until the planned termination point is reached. If at any time the load appears to rise or fall non-uniformly, indicating possible obstruction or failure of the liner pipe, insertion operations shall be terminated immediately, and the liner shall be inspected for damage or obstructions. Any damaged pipe shall be repaired or replaced as approved by the Engineer, and any obstructions removed before resuming insertion operations. After insertion is complete, the Contractor shall allow sufficient time (12 hours, minimum) for any stress/strain due to insertion loading remaining within the liner pipe material to reach equilibrium (allow the pipe to "recover").

Closure in the insertion pit after sliplining operations are complete may be accomplished using a long bell closure kit or other methods, as approved by the Engineer.

- 6.6 Service/Lateral Line Connections: After the liner pipe has been placed and allowed to recover, any sewer service or lateral lines not entering the existing line at a manhole shall be connected to the new liner pipe using prefabricated tapping saddles as approved by the Engineer.
- 6.7 Grouting Annular Space: The annular space between the PVC liner and the existing pipe shall be filled with a grout as per Section 027626.
- 6.8 Backfill of Access/Work Areas: The Contractor shall backfill all points where the liner pipe has been exposed, such as insertion pits, access shafts, manhole or service connections, etc., in accordance with the details included in the plans.
- 6.9 Manhole Replacement: In those places where the entrance pit is excavated at an existing manhole, the manhole shall be replaced with a new manhole in accordance with the applicable specifications and details included in the plans and contract documents.

- 6.10 Inspection of Completed Work: A final closed circuit television inspection in accordance with Standard Specification 027900.2.3 will be required upon completion of sewer line and manhole rehabilitation operations. It is the intent of the plans and specifications that the entire length of the completed sewer line rehabilitation is inspected, however, the Contractor shall have the option of performing final inspection of sections of the sewer line as completed. The time, location, and length of final inspections shall be as approved by the Engineer.
- 6.11 Clean Up: After work has been completed, the Contractor shall clean up all work areas and restore the ground cover to a condition equal to or better than that existing prior to construction. This shall include restoration of any driveways, sidewalks, street pavements, etc., damaged as a result of construction operations. Any excess pipe, spilled concrete or grout, or other construction related materials shall be removed from the site and properly disposed of by the Contractor. All final clean up will be subject to the approval of the Engineer or his designated representative.

## 7. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, Smooth Wall Polyvinyl Chloride (PVC) Pipe for Sliplining Gravity Sewers shall be measured and paid for by the linear foot, complete in place which shall include all materials, equipment, labors, overhead, profit, and any other incidental costs for the liner pipe and grout installation. This will also include all costs for cleaning and televising of the existing line and complete liner installation, any required point repairs, any required traffic control, insertion/work pits, service connections, and manhole rehabilitation if these items are not included as separate bid items in the contract documents. If the liner pipe is installed "through" manholes, the liner will be measured and paid for based on the actual line distance between centers of upstream and downstream manholes. If the liner pipe is not installed completely through manholes, such as in the case of changes in pipe alignment or changes in pipe size, the liner will be measured and paid for based on the actual line distance from inside face of upstream manhole walls to face of downstream manhole walls inside.

SECTION 028020  
SEEDING (S-14)

1. DESCRIPTION

This specification shall govern all work necessary for fertilizing, planting seeds and maintaining vegetation required to complete the project.

2. MATERIALS

2.2 FERTILIZER: All fertilizer shall be delivered in bags or clearly marked containers showing the analysis, name, trademark, and warranty. The fertilizer is subject to testing by the State chemist in accordance with the Texas fertilizer law. Fertilizer shall have an analysis of 12-12-12 (% of nitrogen, phosphoric acid, and potash) as determined by the Association of Official Agricultural Chemists. Fertilizer shall be free flowing and uniform in composition.

2.2 SEED: Seed shall be labeled and meet the requirements of the Texas Seed Law. Labels shall indicate purity, germination, name and type of seed. Seed furnished shall be of the previous season's crop and the date of analysis shown on each bag shall be within twelve months of delivery to the project.

The quantity of "Commercial Seed" required to equal the quantity of "Pure Live Seed" shall be computed by the following formula:

$$\text{Commercial Seed} = \text{Pure Live Seed} \times \frac{10,000}{\% \text{ Purity} \times \% \text{ Germination}}$$

The quantity of pure live seed and type required are indicated below. See drawings for mixture.

COMMON NAME	SCIENTIFIC NAME	LB/ACRE OF PURE LIVE SEED FOR MIXTURES		
		<u>A</u>	<u>B</u>	<u>C</u>
Green Sprangletop	Leptochloa Dubia	1.4	1.4	-
Sideoats Grama (premier)	Bouteloua Curtipendula	.6	-	.6
Bermudagrass (Hulled)	Cynodon Dactylon	7.0	7.4	-
Bermudagrass (Unhulled)	Cynodon Dactylon	-	-	30.0
K. R. Bluestem	Andropogon Ischaemum	1.2	1.2	1.5
Buffalograss	Pennisetum Ciliare	-	4.2	-
Annual Ryegrass	Lolium Multiflorum	5.0	5.0	20.0

Mixture - A: Recommended for clay or tight soil planted between December 1 thru May 1

Mixture - B: Recommended for sandy soil planted between December 1 thru May 1

Mixture - C: Recommended for all soils planted between May 2 thru November 30

2.3 MULCH: Mulch shall be either the straw type, wood cellulose fiber type, asphaltic emulsion type or asphaltic emulsion over wood cellulose fiber type, whichever is indicated on the drawings.

Straw Type - Straw mulch shall be of straw from stalks of domestic grain, bermudagrass or cotton hulls or other approved by Engineer.

Asphaltic Emulsion Type or Asphalt Emulsion Over Wood Cellulose Fiber Type - Shall conform to ASTM specification D 977, Grade SS-1 mixed with water (60% asphalt 40% water).

Wood Cellulose Fiber Type - Wood cellulose fiber shall have no growth inhibiting ingredients and shall be dried with a moisture content less than 10% by weight. Fibers shall be dyed an appropriate color to facilitate visual metering and application of mulch. The cellulose fiber shall be manufactured so that after addition and agitation in slurry tank with fertilizers, seeds, and other approved additives, the fibers in the material will become uniformly suspended to form a homogeneous slurry; when sprayed on the ground, the material shall form a uniform cover impregnated with seeds; the cover shall allow added water to percolate to the underlying soil. The fiber material shall be supplied in packages of not more than 100 lb. gross weight and shall be marked by the manufacturer to indicate the dry weight content.

2.4 EQUIPMENT: The fertilizing, seeding and/or mulching operations shall be accomplished with equipment suitable to the required function. It shall be of current design and in good operating condition. Special seeding and mulching equipment must also meet the following requirements:

Seeder - Equipment for applying a seed-fertilizer mix shall be a hydraulic seeder designed to pump and discharge a waterborne, homogeneous slurry of seed and fertilizer. The seeder shall be equipped with a power driven agitator, and capable of pressure discharge.

Straw Mulch Spreader - Equipment used for straw mulch application shall be trailer mounted, equipped with a blower capable of 2000 r.p.m. operation and that will discharge straw mulch material thru a discharge boom with spout at speeds up to 220 feet per second. The mulch spreader shall be equipped with an asphalt supply and application system near the discharge end of the boom spout. The system shall apply asphalt adhesive in atomize form to the straw at a predetermined rate. The spreader shall be capable of blowing the asphalt-coated mulch, with a high velocity airstream, over the surface at a uniform rate, forming a porous, stable erosion-resistant cover.

Wood Cellulose Fiber Mulch Spreader - Equipment used for this application of fertilizer, seeds, wood pulp, water and other additives shall have a built-in agitation system with sufficient capacity to agitate, suspend and homogeneously mix a slurry containing up to 40 lbs. of fiber plus the required fertilizer solids for each 100 gallons of water. It shall have sufficient agitation and pump capacity to spray a slurry in a uniform coat over the area to be mulched.

### 3. CONSTRUCTION METHODS

3.1 PREPARATION OF SEEDBED: The area to be treated along with requirements for seed, fertilizer and other treatments shall be done as indicated on the drawings and as specified below.

Tilling - The area to be seeded shall be tilled to a depth of 2 to 6 inches by disking, plowing, or other approved methods until soil condition is acceptable.

3.2 FERTILIZING: Fertilizer shall be uniformly applied at a rate of 400 lb/acre, after tilling. Fertilizing and seeding shall be done concurrently. If seeds and fertilizer are distributed in a water slurry. The mixture shall be applied to the area to be seeded within 30 minutes

after all the components have come into contact.

3.3 SEEDING: The seed mixture shall be uniformly distributed at a rate specified above.

Broadcast Seeding - Seed shall be placed with fertilizer, after tilling. After planting, the area shall be rolled on contour with a corrugated roller.

Straw Mulch Seeding - Seed shall be placed with fertilizer, after tilling. After placement of the seed and fertilizer mixture, straw mulch shall be uniformly placed at a rate of 2 tons per acre. As soon as the mulch has been spread, it shall be anchored to the soil a minimum depth of 3 inches by use of a heavy, dulled sick harrow, set nearly straight. Disks shall be set approximately 9 inches apart.

Straw Mulch With Asphalt Seeding - Seed, fertilizer, and straw mulch shall be placed as described in straw mulch seeding with the two exceptions. An asphalt-water emulsion shall be applied to the mulch near the discharge end of the boom spout at a rate of 300 to 600 gallons per acre. Mechanical anchoring by disking will not be required.

Asphalt Mulch Seeding - The seed and fertilizer shall be placed as described for "Broadcast Seeding". After the area has been rolled, the area shall be watered sufficiently to assure a uniform moisture to a minimum depth of 4 inches. As asphalt-water emulsion shall be applied at a rate of 1,500 to 1,800 gallons per acre, immediately after watering. Asphalt shall be applied to the area in such a manner that a complete film is obtained and the finished surface shall be comparatively smooth.

Wood Cellulose Fiber Mulch Seeding - After tilling, mulch shall be applied. Wood cellulose fibers shall be added to the hydraulic seeder after the proportionate amounts of seeds, fertilizer, water and other approved materials are added. Application shall be 1500 lb/acre on flats, 2000 lb/acre on 3:1 slopes, and 2500 lb/acre on 2:1 or greater. 100 lb. of fiber per acre shall be used when asphalt is to be applied over cellulose mulch. The mulch shall provide a uniform cover over the soil surface.

Asphalt Over Wood Cellulose Fiber Mulch Seeding - "Wood Cellulose Fiber Mulch Seeding" shall be done as described above. After mulch has been placed, an asphalt-water emulsion shall be uniformly spread over the mulch at a rate of 1200 gallons per acre.

3.4 MAINTENANCE: The Contractor will water, repair and reseed areas as required for a period of 45 days. This includes erosion damage. Maintenance does not include mowing or weed control, unless indicated on the plans. If at any time the seeded area becomes gullied or otherwise damaged, or the seedings have been damaged or destroyed, the affected portion shall be re-established to the specified condition prior to acceptance of the work.

GUARANTEE: The Contractor shall assure 95% of the seeded area has established growth at 45 calendar days after seeding, unless indicated otherwise on the drawings. Where established, growth is defined as at least one plant per square foot.

#### 4. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, Seeding will be measured by

the horizontal area seeded. This item shall include but not be limited to: tilling soil, fertilizing, planting, watering and maintaining vegetation.



SECTION 028040  
SODDING (S-8)

1. DESCRIPTION

This specification shall govern all work necessary for furnishing and placing sod as required to complete the project.

2. MATERIALS

Fertilizer: All fertilizer used shall be delivered in bags or containers with clearly marked analysis. A granulated fertilizer shall be used with an analysis of 10-20-10. These figures represent the percent of nitrogen, phosphoric acid, and potash nutrients respectively, as determined by the methods of the Association of Official Agricultural Chemists. The rate of application shall be not less than 350 lb\acre (7.23 lb per 100 s.y). In the event that is necessary substitute a fertilizer with a different analysis, it shall be granulated fertilizer with a lower concentration. The total nutrients applied per unit area shall not be less that the specified amount of each nutrient.

Sod: Sod shall consist of live Bermuda grass with thickly matted roots throughout the soil and with a minimum thickness of 3 inches or .25 feet, or live St. Augustine with thickly matted roots throughout the soil with a minimum thickness of 1 inch or .08 feet. The Contractor shall not use sod where grass is thinned out. Grass shall be mowed and raked to remove all weeds and long stems prior to extraction at source. Sod and soil shall be kept moist at all times during sodding process. Care must be taken at all times to retain native soil on the root system.

Water:Water shall be free from oils, acids, alkalies, and salts which may inhibit grass growth. Unless indicated otherwise on the drawings, water shall be provided by the City and shall be transported and applied by the Contractor.

3. CONSTRUCTION METHODS:

Spot Sodding: Prior to planting, the area to be sodded shall be graded and shaped. Squares of sod with a minimum width of 3 inches shall be planted in rows on 15 inch centers in both directions. Sod shall be placed so that lit is firmly against the bottom of the hole; the top of the sod shall not be more than  inch below finished grade. Soil shall be firmly against all sides of the sod. Soil shall not be allowed to cover the sod except for soil incidental to raking, provided that the quantity of soil is not enough to hinder the growth. Areas to be spot sodded shall be indicated on the drawing or as directed by the Engineer in field. After sod has been planted, the area shall be fertilized and watered.

Block Sodding: Prior to planting, the area to be sodded shall be graded and shaped. Sod blocks shall be uniformly placed over the prepared area. The sodded area shall then be fertilized and watered. After the area is sufficiently dry, the area shall be rolled or tamped on form a thoroughly compacted mat. Any voids in the mats shall be filled with additional sod and tamped. If, in the opinion of the Engineer, sloped may cause displacement, areas to be block sodded shall be indicated on the drawings or as directed by the Engineer in the field.

Mulch Sodding: The sod source shall be disked in two directions cutting the sod thoroughly to a depth of not less than 4 inches or more than 10 inches, being careful to avoid having soil containing no grass roots. The disked sod may be windrowed, or otherwise handled in a manner satisfactory to the Engineer. The material shall be rejected if not kept in a moist condition.

Prior to placing mulch sod, the cut slopes shall be scarified by plowing furrows 4 inches to 6 inches deep along horizontal slope lines at 2-foot vertical intervals. Excavated material from the furrows shall not protrude more than 3 inches above the original surface of the cut. Fertilizer shall be distributed uniformly over the area. The sod shall then be dumped upon the prepared area and spread uniformly to the required approximate thickness shown on plans.

Any section not true to lines and cross sections shall be remedied by the addition of sod material. After the sod material has been spread and shaped, it shall be compacted with a corrugated roller of the "Cultipacker" type. All rolling of slope areas shall be on the contour. The area to be mulch sodded shall be indicated on the drawings or as directed by the Engineer in the field.

#### 4. MEASUREMENT & PAYMENT

Unless indicated otherwise in the Proposal Sodding shall be measured by the square yard taken in a horizontal plan. Measurement of the Mulch Sodding shall be by the cubic yard of mulch delivered to place of planting. These items shall include but not be limited to: excavation, transporting, storing, and placing of sod; application of fertilizer and water.

SECTION 028060  
Landscape Planting (S-7)  
(Palm Trees)

1. SCOPE

This Specification shall govern all work and materials required for Landscape Planting.

2. MATERIALS FOR PLANTING

Topsoil - Topsoil shall be a natural, fertile, friable soil, possessing characteristics of representative productive soils in the vicinity. It shall be obtained from naturally well drained areas. Topsoil shall be without admixture of subsoil and free from Bermuda grass, nut grass (Cyperus rotundus) and other objectionable grass, weeds and toxic substances. Topsoil shall not be stripped, collected or deposited while wet.

Peat Moss - Peat Moss is to be of German or Michigan origin and is to be low in content of woody material and free of minerals harmful to plant life; it shall be a ph from 4 to 6, a moisture content of not more than 30 percent, and a water absorbing capacity from 1100 to 2000 percent; it may be natural, shredded, and granulated.

Water - Water will be furnished by the Contractor and will be suitable for irrigation and free of ingredients harmful to plant life. Hose and other equipment required for the placement of water shall be furnished by the Contractor.

Commercial Fertilizers - Commercial Fertilizers shall conform to all applicable state fertilizer laws, shall be delivered in original, unopened containers, each bearing the manufacturer's guaranteed analysis, and shall be uniform in composition, dry, and free flowing. Any fertilizer which becomes caked or otherwise damaged, making it unsuitable for use, will not be accepted.

Guy Wires - Guy wires shall be No. 12 pliable galvanized iron.

Plant Materials - The Engineer may inspect plants at place of growth but such inspection does not preclude the right of rejection on the site.

Plant List - A plant list is shown on the planting plan.

Nomenclature - The scientific and common names of plants herein specified conform with the approved names given in "Standardized Plant Names". Names of varieties not included therein conform generally with names accepted in the nursery trade.

Quality and Size

- a. Plants shall have a habit of growth which is normal for the species and shall be sound, healthy, vigorous, and free from insect pests, plant diseases, injuries, and after effects thereof.
- b. Plants shall conform to the sizes indicated in the Plant List and/or shown on the plans with the exception that larger plants than those specified may be used if approved by the Engineer. Use of such plants shall not increase the contract price. Plant material shall be measured before pruning with branches in normal position.
- c. Plants shall have normal, well developed branches and vigorous fibrous root systems.

- d. Requirements for the measurement, branching, grading, quality, balling, and burlapping of plants generally follow the code of standards currently recommended by the American Association of Nurserymen, Inc., in the "American Standard for Nursery Stock".

#### Palm Specifications

- a. Palms for this project shall be Canary Island Date Palms (Phoenix canariensis) and shall have a minimum trunk-foot height of eight (8) feet and minimum trunk circumference of 60" measured 36" above ground.
- b. Palms shall be balled and burlapped.
- c. The trunk-foot (height) shall be measured from the ground level (before digging) to the base of the leaves (fronds) which provide horizontal branching.
- d. The palms shall, upon delivery, have at least five (5) but not more than ten (10) leaves. Leaves shall be counted in the order of age starting from, but not to include, the bud leaf.
- e. Ends of leaves may be clipped, but not to exceed 50% of each leaf surface.
- f. Palms must be free of dead leaves.
- g. Palms must exhibit all characteristics of healthy and vigorous growth; free of disease and insects and damage related thereto.
- h. Trunks of palms shall be sound and free of symptoms of peeling, cavities, or other deterioration.
- i. The City of Corpus Christi shall have the options of requiring scaled photographs of the prospective palms or availing itself of the opportunity of viewing the palms at their source, before digging.
- j. Palms shall be guaranteed to live for a period of twelve (12) months after completion and acceptance of the project.
- k. At least 48 hours notice must be given to the Engineer prior to delivery of palms. (Weekends and Holidays excepted.)

#### 3. CONSTRUCTION METHODS

Edging shall be placed between the existing turf and proposed planting areas. Edging shall be a 2" x 6" member pressure treated in accordance with AWPA Standard C2-80 (or latest revision) with chromate copper arsenate (CCA) and shall have a minimum final retention of 0.4 pcf by assay.

Substitutions - Substitutions will be permitted only upon submission of proof that a plant is not reasonably obtainable and authorization by the Engineer of a change order providing for use of the nearest equivalent obtainable size and variety of plant having the same essential characteristics with an equitable adjustment of contract price.

#### DIGGING, WRAPPING AND HANDLING

Balled Plants - Plants designated "B&B", balled and burlapped, in the Plant

List, shall be adequately balled with firm, natural balls wrapped with burlap. No balled plant shall be planted if the ball is cracked or broken either before or during the plant process. Any plant which is loose in the ball shall be removed from the site and another plant conforming to the specifications of the plant removed shall be planted in its place at the expense of the Contractor.

Protection - All plants shall be handled in such a manner as to avoid unnecessary damages of any kind. The balls of balled plants which cannot be planted immediately upon delivery shall be covered with moist soil or mulch, or other protection from drying wind and sun. All plants shall receive expert attention and shall be watered as necessary until planted.

Labeling - Durable, legible labels stating in weather resistant ink the correct plant name and size, as specified in the Plant List, shall be securely attached to all plants, bundles or packages of plants of a single species and size, or plant container delivered to the planting site for the purpose of inspection and planting identification.

Shipment and Delivery - The Contractor shall promptly notify the Engineer in advance of the time and manner of delivery of plants, and shall furnish therewith an itemized list of the actual quantity of plant materials to be delivered, on order to insure satisfactory coordination of delivery, and to expedite the required inspection at the point of delivery. These itemized lists and the necessary inspection certificates to accompany each plant and/or shipment shall be delivered to the Engineer prior to acceptance and planting of the plant material. When shipment is made by truck, all plant material shall be packed to provide adequate protection against climatic, seasonal, and breakage injuries during transit. The tops shall be securely covered with tarpaulin or canvas to minimize windwhipping and drying. Under no circumstances shall balled plants be dropped from trucks to the ground. A suitable method of handling shall be employed to insure the careful, workmanlike delivery of heavy balled plants to preclude cracked or "mushroomed" plant balls at the point of delivery.

#### PLANTING OPERATIONS

Time of Planting - Planting operations shall be conducted under favorable weather conditions during the seasons which are normal for such work as determined by accepted practice in the locality. At the option of and on the full responsibility of the Contractor, planting operations may be conducted under unseasonable conditions without additional compensation to the Contractor.

Obstruction Below Grade or Overhead - The Contractor shall secure from the Engineer copies of layout drawings showing the location of all underground utility lines and other structures in order to minimize conflict with same. During excavation operations, the Contractor shall notify the Engineer at once so that arrangements may be made either to move the structure or relocate the planting.

Excavation for Planting - Plant pits shall be circular in outline and shall have vertical sides and flat bottoms. The minimum widths and depths of plant pits, specified below, shall be measured from finished grade.

#### Balled and Burlapped

Pit diameter - 24 inches greater than diameter of ball.  
Pit depth - 12 inches greater than depth of ball.

#### One and Five Gallon Containers

Pit diameter - 18 inches greater than diameter of container.  
Pit depth - 6 inches greater than depth of container.

Soil Preparation - Soil used for planting areas and backfilling plant pits shall be existing excavated topsoil; or if the quantity of existing excavated topsoil is inadequate, sufficient additional topsoil shall be provided. Topsoil for backfilling plant pits shall be thoroughly mixed with the following materials and in the following proportions:

<u>Topsoil</u>	<u>Peat</u>	<u>Sulfur</u>	<u>Fertilizer</u> <u>10-20-10</u>
27 Cu. Ft.	10 Cu. Ft.	2 lbs.	4 lbs.
10 Cu. Ft.	1 Cu. Ft.	1 Cup	1 Cup

Soil mix shall be thoroughly mixed so as to combine all parts. All plants shall be planted in pits, centered and set of excavated soil to such depth that the finished grade level at the plant after settlement will be the same as that which the plant was grown. They shall be planted upright. No burlap shall be pulled out from under balls. Wire and surplus binding from the top of balls shall be loosened or removed to prevent any future girdling. The excavated soil shall be placed and compacted carefully to avoid injury to roots and to fill all voids. When the hole is nearly filled, add water as necessary and allow it to soak away. Fill the hole to finished grade. Form a shallow saucer around each plant by placing a ridge of topsoil around the edge of each pit. Remove containers before planting.

#### Setting Plants

- a. **General:** All plants shall be set 1-1 1/2 to 2 inches above existing grade so that after settlement they bear the same relation to the finished grade of the surrounding soil that they bore to the grade of the soil from which they were dug.
- b. **Ball Plants:** After pits have been dug as hereinbefore specified, a minimum of six inches of compacted prepared soil, or as much more as is needed to allow the ball to rest firmly on such compacted soil at the proper level, shall be placed in the bottom of the pit. Prepared soil shall then be placed around the ball and compacted carefully to avoid injury to roots and to fill all voids. Burlap, rope, wire and other wrapping materials shall be cut away from the top of the ball and removed from the pit, but no burlap shall be pulled from under the ball. All broken or grayed roots shall be cut off clean. When the pit is nearly filled with soil, add water and allow it to soak away. Fill the pit to finished grade. After the ground settles, additional soil shall be filled in to the level of the finished grade.

Pruning - Pruning shall be limited to the minimum necessary to remove injured twigs and branches, and to compensate for the loss of roots during transplanting, but never to exceed one-third of the branching structure. Cuts over 3/4 inch in diameter shall be painted with an approved tree wound paint. Any necessary pruning shall be done at the time of planting.

Mulching - Plants shall be mulched within two days after planting with a four inch deep layer of mulch material, entirely covering the area within the tree well that was created at the time of planting and shown in the plans.

Soaking - All plants to be soaked immediately after planting.

Clean-up - As planting operations proceed, all rope, wire, burlap, empty containers, rocks, clods and all other debris shall not be allowed to accumulate but shall be removed daily and the site kept as clean as possible at all times.

4. MEASUREMENT & PAYMENT

Unless specified otherwise in the Special Provisions, Landscape Planting shall not be measured and is considered subsidiary to the appropriate bid item. See Special Provisions.

SECTION 028200  
MAIL BOX RELOCATION

1. DESCRIPTION

This specification shall govern all work for relocation of mail boxes required to complete the project.

2. REQUIREMENTS

Where mail is delivered to residents by means of roadside mail boxes, the Contractor shall maintain access to these mail boxes throughout the course of construction. Due to the existing location of mail boxes, the Contractor shall, in some cases, be required to move the boxes to temporary locations. Upon completion of construction, the Contractor shall be required to erect the moved mail boxes to a permanent location. Any materials or labor required for either the temporary or permanent move shall be considered subsidiary, and no direct payment shall be made.

It is the intent of this item to provide the residents with mail box facilities at least equal to or better than those existing prior to construction.

In all cases, the temporary and permanent locations of all moved mail boxes shall be in accordance with U. S. Postal Service requirements with regard to height, distance from roadway, accessibility, etc. It shall be the Contractor's responsibility to contact the U. S. Postal Service and gather information as to their requirements.

3. MEASUREMENT AND PAYMENT

Unless included in the proposal as a bid item, all work and materials required for relocation of mail boxes shall not be measured for pay but will be considered to other work.



SECTION 028300  
FENCES RELOCATION (S-12)

1. DESCRIPTION

This specification shall govern all work necessary to accomplish the relocation of any fence which needs to be moved to complete this project. The necessity and the time schedule for relocation of any given fence shall be determined by the Engineer.

2. MATERIALS

Whenever possible, all or part of the existing fence materials shall be used in constructing the relocated fence. Any materials damaged or destroyed as a result of removal of the fence from its existing location shall be replaced with materials of equal or better quality.

3. CONSTRUCTION METHODS

It is the intent of this specification that fences be reconstructed to original condition (condition at time just prior to commencement of construction on this project). Unless otherwise specified, no fence shall be replaced until the area surrounding its new location has been worked to its finished grade. Any fence that is damaged while being removed shall be repaired prior to being reset.

4. MEASUREMENT & PAYMENT

Unless indicated otherwise in the Proposal, Fence Relocation shall be measured by the linear foot of relocated fence (not fence removed from original location).

Payment shall constitute full compensation for removal, replacement, necessary repairs, and all other work related to the relocation of fences.

SECTION 028320  
CHAIN LINK FENCE (S-70)

1. DESCRIPTION

This specification covers the design, construction, and the requirements of the component parts for and accessories for chain link fence.

2. MATERIAL

All materials shall meet the requirements as indicated below or as otherwise specified on the plans.

1. Fabric - The fabric width shall be as shown on the plans. The fabric shall be nine gauge wire woven into 2" mesh hot dip galvanized after fabrication. Fabric 48 inches and under shall be furnished with knuckling at one selvage and twisting and barbing at the other. Fabric 60 inches high and over shall have twisting and barbing on both selvages. Except as herein provided, chain link fence fabric shall conform to the specifications of ASTM Designation: A 392, Class I.
2. Barbed Wire - Barbed wire shall conform to ASTM A 121, unless otherwise specified. Barbed wire shall consist of three strands of 12 gauge wire with 14 gauge point barbs spaced approximately 5 inches apart. Galvanizing for barbed wire shall conform to ASTM Designation: A 121, Class 2.
3. Posts, Braces and Gates - Steel pipe used for posts, braces and gate frames shall conform to the specifications of ASTM Designation: A 120, Steel sections shall be a good commercial quality weldable steel. Posts, frames, and braces shall be as specified below or as otherwise specified.

(a) Line Posts

1. 2 inch nominal Diameter steel pipe
2. 1-7/8 inch 2-inch "H" section of high carbon steel minimum weight 4.1 pounds per linear foot.

(b) End and Corner Posts

1. 2-inch nominal Diameter Steel pipe
2. 2-inch square tubular steel, minimum weight 5.79 pounds per linear foot.

(c) Swing Gate Posts

Swing and gate posts shall conform to ASTM Designation: A 120 and shall be in the following sizes:

<u>Pipe Size</u> (O.D. Nominal)	<u>Square</u> (Tubular)	<u>Date Length</u>
2.875 in.	2.5 in.	Up to 6 feet
4.0 in.	3.0 in.	7 feet to 12 feet
6.625 in.	-	13 and above

(d) Gate Frames

Gate frames shall be standard heavy type, welded, watertight, rigid frame with adequate internal bracing and tension members to prevent sagging. Furnish hinges, latches, stops, keepers, and similar items as approved. Gates to swing open 180 degrees with keepers to hold gates in open position. Furnish latches with provisions for padlocking. On gates of 4 foot length or less, provide latches which automatically engage when gate is swung shut. The size of gate frame members shall be as follows unless otherwise specified. Gates shall be provided with a positive means of maintaining the gate in the closed position.

<u>Use and Section</u>	<u>O. D. or Dimensions, Nominal</u>	
	<u>Round</u>	<u>Square</u>
Frame for fabric 6' and less, and leaf widths not exceeding 8'	1.66"	1.5"
Frame for Fabric over 6' or gate leaves over 8' widths	1.9"	2.0"
Internal Braces	1.66"	1.5"
Top rails and post braces	1.66"	-

4. Top rails - Top rails shall be 1.66 in. O.D. nominal tubular, lengths of not less than 18 feet conforming to ASTM Designation: A 120 and shall be fitted with couplings for connecting the lengths into a continuous run. The couplings shall be not less than 6 inches long, with .070 inch minimum wall thickness, and shall allow for expansion and contraction of the rail. The top rail shall pass through the base of line post barbed wire extension arm and fasten securely to terminal posts.
5. Bracing - Bracing shall be provided for each gate, corner, pull and end post for use when top rail is omitted or with fabric over 6 feet and shall consist of round tubular steel, 1.66 in. O.D. nominal conforming to ASTM Designation: A 120. Bracing shall extend to each adjacent line post at approximately midheight of the fabric. A truss consisting of a rod not less than 3/8 inch in nominal diameter from the line post back to the gate, corner, bull or end post with a turnbuckle or other approved method of adjustment shall also be included.
6. Barbed Wire Extension Arm - Use standard 45 Degree, 3 wire, barbed wire extension arms on posts, except end and gate posts on which use standard post top. Provide hole for top rail. Barbed wire extension arms shall conform to ASTM Designation: A 153.
7. Tension Wire - If top rail is not specified, a top tension wire shall be provided. Spiraled or crimped tension wire shall be not less than #7 gage and shall conform to ASTM Designation: A 116, Class 3. Ties or clips shall be provided for attaching each wire to the fabric at intervals not exceeding 2 feet.

8. Stretcher Bars - Stretcher bars shall not be less than 3/16 by 3/4 inch steel conforming to ASTM Designation: A 153. Stretcher bars shall not be less than 2 inches shorter than the full height of the fabric with which they are used. One stretcher bar shall be provided for each gate and end post and two for each corner and pull post.
9. Ties, Bands or Clips - Ties of 9 gage steel wire shall be provided in sufficient number for attaching the fabric to all line posts at intervals not exceeding 15 inches.

Bands or clips of adequate strength shall be provided in sufficient number for attaching the fabric and stretcher bars to all terminal posts at intervals not exceeding 15 inches. Tension bands and brace bands shall be formed from flat or beveled steel and shall have a minimum thickness of .115 inch and a minimum width of 7/8 of an inch, and shall conform to ASTM Designation: A 153.

### 3. CONSTRUCTION METHODS

Maximum post spacing shall be 10 feet unless otherwise specified. Concrete footings shall be Class "A" Concrete (see Specification Section 030020 "Concrete For Structures") of the following dimensions:

<u>Type of Post</u>	<u>Fabric Height</u>	<u>Hole Diameter</u>	<u>Hole Depth</u>	<u>Post Embedment</u>
Line	3'-4'	6"	24"	21"
Line	5'	8"	30"	27"
Line	6'-12'	9"	38"	36"
Terminal	3'-5'	10"	32"	30"
Terminal	6'-12'	12"	38"	36"

Erect fencing to follow natural ground surface, but adjust minor irregularities in grade as directed. Construct fence to true alignment.

### 4. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, Chain link fence shall be measured by the linear foot of fence measured at the bottom of the fabric along the centerline of fence from center to center of terminal posts excluding gates. Gates will be measured as each gate, complete in place. Payment shall be by the linear foot, as measured above, for the height specified unless otherwise specified. Gates will be paid for as measured above and as described in the proposal unless otherwise specified. Payment shall be full compensation for furnishing and installing all materials, and all work required to construct the fence as required by the plans and these specifications.

SECTION 028340  
CHAIN LINK SECURITY FENCE (S-71)

1. DESCRIPTION

This specification shall govern all work and materials required for providing chain link security fence for this project.

2. MATERIALS

Wire Fabric fencing shall be 9 gauge steel with a minimum tensile strength of 80,000 psi. Mesh size shall be 2 inch ± 1/16 inch between parallel wires. Top edge of fabric shall be twisted and barbed on 6 foot height fencing and shall be knuckled salvage on 4 foot fencing. Bottom edge of all fencing shall be twisted and barbed.

Tie clips of 6 gauge steel shall be furnished in sufficient quantity to fasten fabric to top tension wire or to top rail at 24 inch intervals. Ties shall be furnished to fasten the fabric to bottom tension wire at 24 inch intervals. The fabric shall be tied to line posts at 15 inch intervals.

Line Post shall be provided at a maximum spacing of 10 feet and be of the following sizes:

<u>Fabric Height</u>	<u>Pipe Size</u>	<u>H-Beam Section</u>	<u>Embedment</u>
	<u>Size</u>	<u>Wt./Ft.</u>	<u>Wt./Ft</u> <u>Length</u>
4 ft.	1.90" O.D.	2.72# 1.875" x 1.625"	2.70# 24"
6 ft.	2.375"O.D.	3.65# 2.25" x 1.95"	4.10# 30"

Corner Post and End Post shall be of the following sizes:

<u>Fabric Height</u>	<u>Pipe Section</u>	<u>Embedment Length</u>
<u>Size</u>	<u>Wt./Ft.</u>	
4 ft.	2.375" O.D. 3.65#	30"
6 ft.	2.875" O.D. 5.79#	42"

Gate Post shall be of the following sizes:

<u>Gate Leaf</u>	<u>Pipe Section</u>	<u>Embedment Length</u>
	<u>Size</u>	<u>Wt./Ft.</u>
to 6 ft.	2.875" O.D.	5.79# 36"
6 to 13 ft.	4.0 " O.D.	9.10# 42"
13 to 18 ft.	6.625" O.D.	18.97# 48"

Post caps for pipe sections shall be designed to exclude all moisture. Where barbed wire is specified, extension arms shall be integral with post caps. Where top rail is specified, post caps shall have an opening for top rail. All posts caps shall have a 2 inch skirt for rigidity.

Top rail, where called for, shall be 1.625 inch O.D. steel pipe weighing 2.27#/foot. Top rail shall be furnished in random lengths not less than 18 feet per section and shall be joined with outside sleeve, steel couplings not less than 6 inches long and having a wall thickness of not less than 0.70 inch. Couplings shall be designed to allow for expansion movement of the top rail.

Tension wire for top finish, where no top rail is specified, shall be 7 gauge high carbon steel wire. Tension wire shall be furnished for bottom edge of all fence fabric.

Trussed bracing shall be furnished for each panel adjacent to a terminal, pull, corner, or gate post. Compression member shall be 1.625 inch O.D. pipe as specified for top rail material. Tension members shall be 3/8 inch diameter steel rods with turnbuckles.

For 6-foot fences with top tension wire, braced panels shall consist of horizontal pipe brace, located approximately 4 inches below top of fabric, a diagonal pipe brace, attached at the midpoint of the terminal post and at the bottom of the adjacent line post, and a truss rod, attached to the top of the adjacent line post, extending diagonally to the bottom of the terminal post.

For 6-foot fences with top rail, braced panels shall consist of a horizontal pipe brace, midway between top and bottom of fence fabric, with a truss rod expending from midpoint of the line post diagonally to bottom of terminal post.

Four-foot fences with top rail shall be braced with a truss rod connected to the bottom of the terminal post and extending to top of adjacent line posts.

Four-foot fences without top rail shall have a horizontal brace pipe at the top of adjacent line posts.

Four-foot fences without top rail shall have a horizontal brace pipe at the top of the fabric and a diagonal truss rod installed as described above.

Gates shall be fabricated from 1.90 inch O.D. pipe weighing 2.72#/foot. Fabric on gates shall be the same as that specified for fencing. The following accessories shall be furnished for each gate:

Corner and tee fittings of malleable iron or pressed steel having means for attaching diagonal bracing members.

Hinges of malleable iron providing for full 180 degree swing with bottom hinges to be ball and socket type.

Diagonal braces consisting of 3/8 inch diameter truss rods with turnbuckles, two to each gate frame. Vehicle gates shall have vertical 1.90 inch O.D. pipe brace at center of each gate leaf.

Latches for single gates shall have a single fork latch with padlock eye; double leaf gates shall have two fork latches mounted on center plunger rod with padlock eye.

Hold backs shall be provided for each leaf of vehicular gates, employing a semi-automatic hold back catch to be anchored at least 12 inches into a 12 inch diameter by 24 inch deep concrete footing.

A malleable iron center rest, designed to receive the plunger rod, to be anchored at least 12 inches into a 12 inch diameter by 24 inch deep concrete footing, shall be provided for all double leaf gates.

The top of all gate frames shall align with the fencing top rail. Vehicular gates shall be 4 inches greater in overall height than the adjacent fencing so as to extend to within 2 inches of pavement between 6 inch curbs, if curbs are designated on the plans.

Barbed wire, where specified, shall be 12<sup>0</sup> gauge with barbs spaced approximately 5 inches apart. Three strands of barbed wire will be required where barbed wire top is specified.

Barbed wire support arms shall be at an angle of 45 degrees from vertical and shall have clips for attaching 3 strands of barbed wire. Each support arm shall be of sufficient strength to support a 200 lb. weight applied at the outer strand of barbed wire.

Stretcher bars shall not be less than 3/16" inch by 3/4" inch flat steel and not more than 2 inches shorter than the fabric height. One stretcher bar shall be provided for each gate and end post. Two stretcher bars shall be provided for each corner and pull posts. Stretcher bars shall be attached to terminal posts with 1 inch x 1/8 inch flat steel bands with 3/8 inch carriage bolts at intervals not exceeding 15 inches.

Miscellaneous fittings and fasteners shall be furnished in sufficient quantities to erect all fencing materials in a proper manner.

Approval of fence materials shall be obtained from the Engineer prior to erection.

Galvanizing and Aluminum Coating. All material used in "Chain Link Security Fence" shall be hot dip zinc coated as specified by the following, except that the fabric may be aluminum coated:

All posts and pipe: ASTM Designation: A 120 (1.8 oz/sf).

All H-beam sections: ASTM Designation: A 123 (2.0 oz/sf).

Fence fabric: ASTM Designation: A 392, Class 1 (1.2 oz/sf) or ASTM Designation: A 491 (0.40 oz/sf).

Tension wire, barbed wire: ASTM Designation: A 121, Class III (0.80 oz/sf).

Post caps, stretcher bars, miscellaneous fittings: ASTM Designation: A 153.

Weight of zinc coating for all items shall be determined in accordance with ASTM Test Designation: A 90 except for core wire which shall have a galvanized coating weighing not less than 0.35 ounces of zinc per square foot. Field welds and cuts shall be touched-up with an approved zinc coating.

### 3. CONSTRUCTION METHODS

Clearing and Grading. The Contractor shall perform all clearing of brush, rocks and debris which may be necessary for the installation of this fencing. The Engineer will stake out the locations for corner posts and terminal posts in this installation. The fencing panels between corner and terminal posts shall generally follow the finished ground elevations. However, the Contractor shall grade off minor irregularities in the path of the fencing as necessary to limit the variation of grade under the bottom edge of fence fabric to a distance of not more than six inches and not less than two inches to the ground.

Post Spacing. Maximum spacing for line posts shall be 10 feet 0 inches. Pull posts shall be located not more than 500 feet apart and at each change in

direction exceeding 20 degrees, both horizontally and vertically. Runs of fencing over 500 feet but less than 1,000 feet shall have a pull post in the center of the run.

Postholes. Holes for concrete footings for all posts shall be drilled to the dimensions listed in the following tables:

Holes for Line and End Posts

<u>Type Post</u>	<u>Fabric Height</u>	<u>Min.Hole Diameter</u>	<u>Min.Hole Depth</u>	<u>Post Embedment</u>
Line	4'	9"	30"	24"
Line	6'	10"	36"	30"
End	4'	12"	36"	30"
End	6'	12"	48"	42"

Holes for Gate Posts

<u>Gate Post Size</u>	<u>Min. Hole Diameter</u>	<u>Min. Hole Depth</u>	<u>Post Embedment</u>
2.875" O.D. x 5.79#	12"	42"	36"
4" O.D. x 9.10#	18"	48"	42"
6.625" O.D. x 18.97#	18"	54"	48"

Where solid rock is encountered without an overburden of soil, line posts shall be set a minimum depth of 12 inches, and end, corner, gate and pull posts a minimum of 18 inches into the solid rock. The hole shall have a minimum diameter one inch greater than the largest dimension of the post section to be set. After the post is set and plumbed, the hole shall be filled with grout consisting of one part Portland cement and three parts clean, well graded sand. Other grouting materials may be used if approved or specified by the Engineer. The grout shall be thoroughly worked into the hole so as to leave no voids. The grout shall be crowned to carry water from the post.

Where solid rock is covered by an overburden of soil or loose rock, the posts shall be set to the full depth shown in Table above unless the penetration into solid rock reaches the minimum depths specified above, in which case, the depth of penetration may be terminated. Concrete footings shall be constructed from the solid rock to the top of the ground. Grouting will be required on the portion of the post in solid rock.

Excavated material from footings shall be removed from the job site by the Contractor.

Concrete for Footings. Concrete for footings shall be Class "B" concrete in accordance with Section 030020, unless otherwise specified on plans. All concrete footings shall be cast up to finish grade and crowned 2 inches to shed water. Excess concrete not used in the footings, and any other construction debris, shall be removed from the site.

Fabric Erection. The fence fabric shall be erected by securing one end and applying sufficient tension to the other end to remove all slack before making attachments. The fabric shall be cut and each span shall be attached independently at all corner posts and pull posts. Fastening to end, pull, corner and gate posts shall be with stretcher bars which shall be secured to the posts with stretcher bar bands at intervals not exceeding 15 inches. Fence



fabric shall generally follow the finished contour of the site with the bottom edge of fabric located 2 inches above the grade. In uneven areas, the ground shall be graded so that the maximum distance between bottom of fabric and ground in limited to 6 inches.

Electric grounds. Grounding rods shall be at least 5/8 inch diameter by 8 feet long "copperweld" rods driven or drilled into the soil so that the top of the rod is approximately 6 inches below grade. A No. 6 solid copper conductor shall be clamped to the ground rod and the bottom tension wire of the fence with cast bronze clamps with bronze or stainless steel bolts and washers. Each 1,000 foot of fence shall be provided with a ground located near the center of the run. At least one electrical ground shall be installed for each fenced closure. A ground shall be provided directly under the point where a power line passes over the fence.

#### 4. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, Chain Link Security Fence shall be measured by the linear foot. Measurement shall include but not be limited to furnishing and erecting all fence materials, gates, caps, concrete, ground wires, and cleanup. Payment shall be made at the unit price bid and shall fully compensate the Contractor for all materials required, all labor, all tools, all equipment and all other incidentals required to complete the work as shown on the contract drawings and as specified herein.

SECTION 028360  
CHAIN LINK SECURITY FENCE (S-71A)

1. DESCRIPTION

This specification shall govern all work and materials required for providing chain link security fence for this project.

2. MATERIALS

Wire Fabric fencing shall be 6 gauge steel with a minimum tensile strength of 80,000 psi. Mesh size shall be 2 inch + 1/16 inch between parallel wires. Top edge of fabric shall be twisted and barbed on 7 foot height fencing and shall be knuckled salvage on 4 foot fencing. Bottom edge of all fencing shall be twisted and barbed.

Tie clips of 6 gauge steel shall be furnished in sufficient quantity to fasten fabric to top tension wire or to top rail at 24-inch intervals. Ties shall be furnished to fasten the fabric to bottom tension wire at 24-inch intervals. The fabric shall be tied to line posts at 15-inch intervals.

Line Post shall be provided at a maximum spacing of 10 feet and be of the following sizes:

Fabric Height Length	Pipe Size		H-Beam Section		Embedment
	Size	Wt./Ft.	Size	Wt./Ft.	
7 Ft.	2.375" O.D.	3.65#	2.25" x 1.95"	4.10#	32"

Corner Post & End Post shall be of the following sizes:

Fabric Height	Pipe Section		Embedment Length
	Size	Wt./Ft.	
7 Ft.	2.875" O.D.	5.79#	42"

Post caps for pipe sections shall be designed to exclude all moisture. Where barbed wire is specified, extension arms shall be integral with post caps. Where top rail is specified, post caps shall have an opening for top rail. All post caps shall have a 2-inch skirt for rigidity.

Top rail, where called for, shall be 1.625 inch O.D. steel pipe weighing 2.27#/foot. Top rail shall be furnished in random lengths not less than 18 feet per section and shall be joined with outside sleeve, steel couplings not less than 6 inches long and having a wall thickness of not less than 0.70 inch. Couplings shall be designed to allow for expansion movement of the top rail.

Tension wire for top finish, where no top rail is specified, shall be 7-gauge high carbon steel wire. Tension wire shall be furnished for bottom edge of all fence fabric.

Trussed bracing shall be furnished for each panel adjacent to a terminal, pull, corner, or gate post. Compression member shall be 1.625-inch O.D. pipe as specified for top rail material. Tension members shall be 3/8-inch diameter steel rods with turnbuckles.

For 7-foot fences with top tension wire, braced panels shall consist of horizontal pipe brace, located approximately 4 inches below top of fabric, a diagonal pipe brace, attached at the midpoint of the terminal post and at the

bottom of the adjacent line post, and a truss rod, attached to the top of the adjacent line post, extending diagonally to the bottom of the terminal post.

For 7-foot fences with top rail, braced panels shall consist of a horizontal pipe brace, midway between top and bottom of fence fabric, with a truss rod expending from midpoint of the line post diagonally to bottom of terminal post.

Barbed wire, where specified, shall be 12-1/2 gauge with barbs spaced approximately 5 inches apart. Three strands of barbed wire will be required where barbed wire top is specified.

Barbed wire support arms shall be at an angle of 45 degrees from vertical and shall have clips for attaching 3 strands of barbed wire. Each support arm shall be of sufficient strength to support a 200 lb. weight applied at the outer strand of barbed wire.

Stretcher bars shall not be less than 3/16" x 3/4" flat steel and not more than 2 inches shorter than the fabric height. One stretcher bar shall be provided for each gate and end post. Two stretcher bars shall be provided for each corner and pull posts. Stretcher bars shall be attached to terminal posts with 1 inch x 1/8 inch flat steel bands with 3/8 inch carriage bolts at intervals not exceeding 15 inches.

Miscellaneous fittings and fasteners shall be furnished in sufficient quantities to erect all fencing materials in a proper manner.

Approval of fence material shall be obtained from the engineer prior to erection.

Galvanizing and Aluminum Coating: All material used in "Chain Link Security Fence" shall be hot dip zinc coated as specified by the following except that the fabric may be aluminum coated:

All posts and pipe: ASTM Designation: A 120 (1.8 oz/sf).

All H-beam sections: ASTM Designation: A 123 (2.0 oz/sf).

Fence fabric: ASTM Designation: A 392, Class 1 (1.2 oz/sf) or ASTM Designation: A 491 (0.40 oz/sf).

Tension Wire/Barbed Wire: ASTM Designation: A 121, Class III (0.80 oz/sf).

Post caps, stretcher bars, miscellaneous fittings: ASTM designation: A 153.

Weight of zinc coating for all items shall be determined in accordance with ASTM Test Designation: A 90 except for core wire which shall have a galvanized coating weighing not less than 0.35 ounces of zinc per square foot. Field welds and cuts shall be touched-up with an approved zinc coating.

### 3. CONSTRUCTION METHODS

Clearing and Grading: The contractor shall perform all clearing of brush, rocks and debris which may be necessary for the installation of this fencing. The engineer will stake out the locations for corner posts and terminal posts in this installation. The fencing panels between corner and terminal posts shall generally follow the finished ground elevations. However, the contractor shall grade off minor irregularities in the path of the fencing as necessary to limit the variation of grade under the bottom edge of fence fabric to a distance not more than six inches and not less than two inches to the ground.

Post Spacing: Maximum spacing for line post shall be 10'-0". Pull posts shall be located not more than 500 feet apart and at each change in direction exceeding 20 degrees, both horizontally and vertically. Runs of fencing over 500 feet but not less than 1,000 feet shall have a pull post in the center of the run.

Postholes: Holes for concrete footings for all posts shall be drilled to the dimensions listed in the following tables:

**HOLES FOR LINE AND END POSTS**

Type Post	Fabric Height	Min. Hole Diameter	Minimum Hole Depth	Post Embedment
Line	7'	12"	36"	32"
End	7'	12"	48"	42"

Where solid rock is encountered without an overburden of soil, line posts shall be set a minimum depth of 12 inches, and end, corner, gate and pull posts a minimum of 18 inches into the solid rock. The hole shall have a minimum diameter one inch greater than the largest dimension of the post section to be set. After the post is set and plumbed, the hole shall be filled with grout consisting of one part Portland cement and three parts clean, well graded sand.

Other grouting material may be used if approved or specified by the engineer. The grout shall be thoroughly worked into the hole so as to leave no voids. The grout shall be crowned to carry water from the post.

Where solid rock is covered by an overburden of soil or loose rock, the posts shall be set to the full depth shown in Table above unless the penetration into solid rock reaches the minimum depths specified above, in which case, the depth of penetration may be terminated. Concrete footings shall be constructed from the solid rock to the top of the ground. Grouting will be required on the portion of the post in solid rock.

Excavated material from footings shall be removed from the job site by the contractor.

Concrete for Footings: Concrete for footings shall be Class "B" concrete in accordance with Section 030020, unless otherwise specified on plans. All concrete footings shall be cast up to finish grade and crowned 2 inches to shed water. Excess concrete not used in the footings, and any other construction debris, shall be removed from the site.

Fabric Erection: The fence fabric shall be erected by securing one end and applying sufficient tension to the other end to remove all slack before making attachments. The fabric shall be cut and each span shall be attached independently at all corner posts and pull posts. Fastening to end, pull, corner and gate posts shall be with stretcher bars which shall be secured to the posts with stretcher bar bands at intervals not exceeding 15 inches. Fence fabric shall generally follow the finished contour of the site with the bottom edge of fabric located 2 inches above the grade. In uneven areas, the ground shall be graded so that the maximum distance between bottom of fabric and ground is limited to 6 inches.

Electric grounds: Grounding rods shall be at least 5/8 inch diameter by 8 feet long "copperweld" rods driven or drilled into the soil so that the top of the rod is approximately 6 inches below grade. A No. 6 solid copper conductor shall be clamped to the ground rod and the bottom tension wire of the fence with cast bronze clamps with bronze or stainless steel bolts and washers. Each 1,000 foot of fence shall be provided with a ground located near the center of the run. At least one electrical ground shall be installed for each fenced enclosure. A ground shall be provided directly under the point where a power line passes over the fence.

**4. MEASUREMENT AND PAYMENT**

Unless indicated otherwise in the Proposal, Chain Link Security Fence shall be measured by the linear foot. Measurement shall include but not be limited to all fence materials, gates, caps, concrete, ground wires, and cleanup. Payment shall cover all materials required, labor, tools, equipment and all other

incidentals required to complete the work.

SECTION 028370  
BARBED WIRE FENCES (S-48)

1. DESCRIPTION

This specification shall govern all work required for furnishing and installing all barbed wire fences and gates required to complete the project.

2. GENERAL

Barbed wire fences shall be class D four strand barbed wire in accordance with FAA Item F-161 (10/24/74).

3. MATERIALS

Wire

- a. Woven Wire (Zinc-coated). The woven wire fencing shall be 7-bar, 26-inch field fence with top and bottom wires No. 10 ASW gauge, and filler and stay wire No. 12 1/2 ASW gauge. Stay wires shall be spaced 6 inches apart. All wire shall be smooth galvanized steel wire conforming to Fed. Spec. RR-F-221, Type B. All wires shall be two-dip and spaced as shown on the plans.
- b. Barbed Wire (Zinc-coated). Zinc coated barbed wire shall be 2 strand twisted No. 12 1/2 ASW gauge galvanized steel wire with 4-point barbs of No. 14 ASW gauge galvanized steel wire. All wire shall conform to Fed. Spec. RR-F-221, Type A. The barbs shall be spaced approximately 4 inches apart.
- c. Barbed Wire (Copper-covered). Copper-covered steel barbed wire shall conform to Fed. Spec. RR-F-221, Type A.
- d. Barbed Wire (Aluminum-coated). Aluminum-coated steel barbed wire shall be 2-strand twisted No. 12 1/2 ASW gauge. The 4-point barbs of No. 14 ASW gauge aluminum-coated steel wire shall be spaced approximately 5 inches apart. The steel wire shall have a tensile strength of between 60,000 and 80,000 pounds per square inch and the aluminum coating shall have a minimum weight of .30 ounce per square foot of wire surface on the No. 12 1/2 ASW gauge line wire and .25 ounce per square foot of wire surface on the No. 14 ASW gauge barbs.
- e. Bracing wire (zinc-coated). Wire used for cable for bracing shall be No. 9 smooth galvanized soft wire.

161-2.2 FENCED POSTS, GATES, RAILS, BRACES AND ACCESSORIES. These items, when specified, shall conform to the requirements of Fed. Spec. RR-F-183 and shall be zinc coated.

CONCRETE. Concrete shall be Class B in accordance with City Standard Specification Section 030020.

4. - CONSTRUCTION METHODS

General

The fence shall be constructed in accordance with the plans and as specified herein using new materials, and all work shall be performed in a workmanlike manner satisfactory to the Engineer. The route of the fence is indicated on sheet 2 of the drawings. The existing fence with the exception of gates shall

become property of the contractor and be removed from the site. The fence shall be placed on the same alignment as that of the existing fence. The contractor shall span the opening below the fence with barbed wire fastened to stakes of the required length at locations of small natural or drainage ditches where it is not practical to conform the fence to the general contour of the ground surface. The new fence shall be permanently tied terminals of existing fences whenever required by the engineer. The finished fence shall be plumb, taut, true to line and ground contour, and complete in every detail.

When directed, in order to keep stock on adjoining property inclosed at all times, the contractor shall arrange the work so that construction of the new fence will immediately follow the removal of existing fences. The length of unfenced section at any time shall not exceed 300 feet or such length that the stock can be kept in the proper field. The work shall progress in this manner and at the close of the working day the newly constructed fence shall be tied to the existing fence. Any openings in the fence shall be guarded when stock is using the adjoining property.

CLEARING FENCE LINE. The site of the fence shall be sufficiently cleared of obstructions, and surface irregularities shall be grades so that the fence will conform to the general contour of the ground. The fence line shall be cleared to minimum width of 10 feet on each side of the centerline of the fence. This clearing shall consist of the removal of all stumps, brush, rocks, trees, or other obstructions which will interfere with proper constructions of the fence. The area shall be moved. Stumps within the cleared area of the fence shall be remove. When shown on the plans or as directed by the engineer, the existing fences, which coincide with or are in a position to interfere with the new fence location shall be removed by the contractor as part of the construction work unless such removal is listed as a separate item in the bid schedule. All holes remaining after post and stump removal shall be refilled with suitable soil, gravel, or other material acceptable to the engineer and shall be compacted & properly with tampers.

The work shall include the handling and disposal of all material cleared, excavated or removed, regardless of the type, character, composition, or condition of such material encountered.

INSTALLING POSTS. All posts shall be spaced as shown on the plans. Corner, brace, anchor, end, and gate posts shall be set in concrete bases as shown on the plans. The top of the base shall be slightly above the ground surface, trowel finished, and sloped to drain. Holes of full depth and size for the concrete bases for posts shall be provided even if blasting of rock or other obstructions is necessary. All line posts may be either driven or set in dug holes to a penetration of 3 feet. All post setting shall be done carefully and to true alignment. Dirt removed for placing posts, anchor bars, flanges, etc., shall be replaced, tamped, and leveled. When posts are driven, care shall be exercised to prevent marring or buckling of the posts. Damaged posts shall be replaced at the contractor's expense. No extra compensation will be made for rock excavation. Rock excavation shall not be ground for extension of time.

BRACING All corner, anchor, end, and gate posts shall be braced as shown on the plans. Anchor posts shall be set at approximately 500-foot intervals and braced to the adjacent posts.

INSTALLING WIRE. All barbed wire and woven wire shall be placed on the side of the posts away from the airport, or as directed, at the height indicated on the plans. The woven wire shall be carefully stretched and hung without sag and with true alignment. Care shall be taken not to stretch and wire so tightly that it will break in cold weather or pull up corner and brace posts. All horizontal wires shall be fastened securely to each post by fasteners or clips designed for

use with the posts furnished. The woven wire shall be wrapped around end, corner, and gate post and the ends of all horizontal wires shall be tied with snug, tight twists. The wire shall be secured to prevent slipping up and down the post. Barbed wire strands shall be stretched and each strand secured to each post to prevent slipping out of line or becoming loose. At end, corner, and gate posts the barbed wire shall be securely wrapped and anchored once about the post from outside and secured against slipping by tying the ends with snug, tight twists. However, on spans of less than 100 feet both ends of the span need not be wrapped around the posts. The bottom wire of the woven wire fencing shall clear the ground by not more than 4 inches or less than 1 inch at any place.

SPLICING WIRE. Splicing in barbed and woven wire will be permitted if made with an approved galvanized bolt-clamp splice or a wire splice made as follows: The ends of each wire shall be carried 3 inches past the splice tool and wrapped around the other wire for at least six turns in opposite directions. After the tool is removed, the space occupied by it shall be closed by pulling the ends together. The unused ends of the wire shall be cut close to make a neat, workmanlike job.

EXISTING FENCE CONNECTIONS. Wherever the new fence joins an existing fence, either at a corner or at the intersection of straight fence lines, a corner or anchor post shall be set at the junction and braced and anchored the same as herein described for corner post.

If the connection is made at other than the corner of the new fence, the last span of the old fence shall contain a brace span.

#### GATES

See the gate schedule in the drawings for location, size and description of proposed gate work where new gates are required. They will typically be cantilever type roller gates. The contractor shall submit shop drawings of the gate and assembly for pre-approval by the engineer prior to bid openings. The gate and assembly shall meet the following general requirements. Gates shall be of the double gate type with a combined clear opening of 30 feet. Roller assembly shall be of a type designed to support the gate without ground rollers.

Rollers shall be mounted on steel gate post with a minimum diameter of 4 inches. Gate post shall be placed in 12" diameter post holes excavated to a minimum depth of 48 inches. Gate post shall be embedded in a hole a minimum of 36" with the remainder of the hole being filled with Class B concrete. The gate frame shall be constructed of galvanized steel pipe with a minimum diameter of 2 inches for exterior member and 1 5/8 inches for internal braces. The size of the gate frame shall be approximately 3'-6" x 22'. The gate barrier wire shall be N° 6 guage 2" wire. The gate shall be installed with a lock assemble located at the center of the 30 foot opening. The lock assemble shall provide lateral support and be doweled into concrete at mid-opening and shall not obstruct traffic when the gate is open.

#### 5. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, Barbed Wire Fences shall be measured in place from outside to outside of end posts or corner posts and shall be the length of fence actually constructed, except for the space occupied by the gates.

Gate shall be measured in units for each gate installed and accepted.

Payment shall be full compensation for furnishing all materials and for all preparation, erection, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

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SECTION 028380  
SANITARY LANDFILL FENCE (S-76)

(18' high perimeter containment)

1. DESCRIPTION

This specification shall govern all materials and work required to complete the perimeter containment fence.

2. MATERIALS

WOOD POLES shall be 25' long, southern yellow pine, class 6, poles in accordance with ANSI's "American National Standard Specifications and Dimensions for Wood Poles". Poles shall be treated in accordance with C-4 of the American Wood Preservers Association Standards with Creosote conforming to P-1 of said standards, to a minimum retention of 10 pounds per cubic foot.

WIRE FABRIC shall be 2" by 4", 14 gage, 72" wide, and galvanized.

ZINC-COATED (GALVANIZED) STEEL WIRE STRAND shall be in accordance with ASTM A 475 and shall be 7 strand EHS grade with a minimum breaking strength of 6,650 lb and with Class B coating.

EYEBOLT shall be of 1" steel rod with a minimum shank length of 9.75" (or 1" larger than the pole diameter) and an eye diameter of 1.25". The eyebolt along with the required bolt and washer shall be galvanized. The bolt shall restrain a 1,500 pound load.

STEEL SHACKLE shall be galvanized steel, load rated at a minimum of 2 tons, weldless with screw pin, and shall secure the wire, the wire fabric and wire strands to the eyebolts.

PREFORMED GRIP shall be constructed of helically formed galvanized steel, when applied, encircles the steel wire strand. Two types shall be required; splice grip and terminal grip. The splice grips shall consist of a set of gripping legs at each end for splicing which is used for splicing. The guy grip shall have one looped end as a terminal and the other end with gripping legs for connection to the steel strand. Load capacity of grips shall exceed wire strand capacity.

3. CONSTRUCTION METHODS

The largest end of the pole goes into the ground!

Poles shall be spaced at 25' centers. Embedment of poles shall be between 6.5' and 7'. Maximum allowable horizontal tolerance from true alignment shall be 4".

Backfill around pole shall be cement stabilized sand mixed at a ratio of 1 sack Portland cement per cubic yard of sand. The backfill shall be well compacted around pole after proper alignment has been achieved.

Corner and end bracing shall be placed at all openings and corners.

Wire Fabric shall be spliced such that the capacity of splice is not less than 90% of that of the unspliced section.

4. FENCE OPERATION

The fence is designed to be lowered when the wind speed is anticipated to exceed 60 MPH. This is done by disconnecting the upper two rows of wire fabric and folding them onto the lower row, resulting in a 3 ply fence 6' high.

When indicated on the plans, after the fence has been completely installed, the Contractor will be required to completely lower the fence to the 6' position. The fence shall then be corrected of any operational deficiencies, and restored to its normal position by the Contractor. This shall be considered subsidiary work.

Sequence of lowering shall generally be as follows:

1. Remove tie wires connecting the fabric to the top wire strand within 30' of end or corner connection.
2. Disconnect top row of shackles beginning at end or corner connection.
3. Use shackles from top row to connect the lowered top strand with the lower intermediate strand.
4. Retention the lowered top strand and connect at end or corner connection.
5. Retie wire fabric within 30' of end or corner section along the lowered top wire strand.
6. Remove tie wire connecting the fabric to the upper intermediate wire strand within 30' of end or corner connection.
7. Disconnect upper intermediate row of shackles beginning at end or corner connection.
8. Use shackles from the upper intermediate row to connect the lowered upper intermediate strand with the bottom strand.
9. Retention the lowered upper intermediate strand at end or corner connection
10. Retie wire fabric within 30' of end or corner section along the lowered upper intermediate strand.

5. EXTRA MATERIALS

The Contractor shall provide the Sanitation Department with the following materials:

ITEM	QUANTITY
Galvanized Steel Wire Strand	1,000 Ft. Roll
Galvanized Shackles	50
Preformed Splices Grip	25
Preformed End Grip	25
Wire Fabric	100 Ft. Roll

The extra materials shall be furnished to the Sanitation Department storage yard at the landfill and shall be considered subsidiary to the project.

6. MEASUREMENT & PAYMENT

Unless indicated otherwise in the Proposal, Sanitary Landfill Fence shall be by the linear foot along the center line of the fence and shall include but not be limited to post, wire, connections, splices, sand backfill, corner and end sections, etc.

Payment shall fully compensate the Contractor for all materials, labor, equipment, and other incidentals required to install the fence.

SECTION 028810  
RECREATIONAL EQUIPMENT (S-99)

1. DESCRIPTION

This specification governs all labor, materials, equipment required for proper installation of recreational equipment, and related items.

2. MATERIALS

All materials shall be as manufactured by Gametime Equipment or an approved equal. All equipment and related items are listed in the Appendix of the Special Provisions and Specifications.

3. INSTALLATION

All equipment and related items shall be installed as per manufacturers recommendations unless otherwise indicated on the plans.

4. MEASUREMENT AND PAYMENT

Recreational equipment shall be measured and paid for by lump sum. Such payment shall constitute full compensation for all labor, materials, equipment and incidentals necessary to complete the installation as specified.

SECTION 030020  
PORTLAND CEMENT CONCRETE (S-40)

1. DESCRIPTION

This specification shall govern for the materials used; for the storing and handling of materials; and for the proportioning and mixing of concrete for culverts and incidental concrete construction.

The concrete shall be composed of Portland cement, aggregates (fine and coarse), admixtures if desired or required, and water, proportioned and mixed as hereinafter provided.

2. MATERIALS

(1) Cement

The cement shall be either Type I, II or III Portland Cement conforming to ASTM Designation: C 150, modified as follows:

Unless otherwise specified by the Engineer, the specific surface area of Type I and II cements shall not exceed 2000 square centimeters per gram (Wagner Turbidimeter - Test Method Tex-310-D).

For concrete piling, the above limit on specific surface area is waived for Type II cement only. The Contractor shall furnish the Engineer, with each shipment, a statement as to the specific surface area of the cement expressed in square centimeters per gram.

For cement strength requirements, either the tensile or compressive test may be used.

Either Type I or II cement shall be used unless Type II is specified on the plans. Except when Type II is specified on the plans, Type III cement may be used when the anticipated air temperature for the succeeding 12 hours will not exceed 60° F. Type III cement may be used in all precast prestressed concrete, except in piling when Type II cement is required for substructure concrete.

Different types of cement may be used in the same structure, but all cement used in any one monolithic placement shall be of the same type and brand. Only one brand of each type will be permitted in any one structure unless otherwise authorized by the Engineer.

Cement may be delivered in bulk where adequate bin storage is provided. All other cement shall be delivered in bags marked plainly with the name of the manufacturer and the type of cement. Similar information shall be provided in the bills of lading accompanying each shipment of packaged or bulk cement. Bags shall contain 94 pounds net. All bags shall be in good condition at time of delivery.

All cement shall be properly protected against dampness. No caked cement will be accepted.

Cement remaining in storage for a prolonged period of time may be retested and rejected if it fails to conform to any of the requirements of these specifications.

(2) Mixing Water

Water for use in concrete and for curing shall be free from oils, acids, organic matter or other deleterious substances and shall not contain more than 1000 parts per million of chlorides as CL nor than 1000 parts million of sulfates as SO<sub>4</sub>.

Water from municipal supplies approved by the State Health Department will not require testing, but water from other sources will be sampled and tested before

use in structural concrete.

Tests shall be made in accordance with the "Standard Method of Test for Quality of Water to be used in Concrete" (AASHTO Method T-26), except where such methods are in conflict with provisions of this specification.

(3) Coarse Aggregate

Coarse aggregate shall consist of durable particles of gravel, crushed blast furnace slag, crushed stone, or combinations thereof; free from frozen material or injurious amount of salt, alkali, vegetable matter, or other objectionable material either free or as an adherent coating; and its quality shall be reasonably uniform throughout. It shall not contain more than 0.25 percent by weight of clay lumps, nor more than 1.0 percent by weight of shale, nor more than 5 percent of weight of laminated and/or friable particles when tested in accordance with Test Method Tex-413.A. It shall have a wear of not more than 40 percent when tested in accordance with Test Method Tex-410-A.

Unless otherwise specified on the plans, coarse aggregate will be subjected to five cycles of the soundness test in accordance with Test Method Tex-411-A. The loss shall not be greater than 12 percent when sodium sulfate is used, or 18 percent when magnesium sulfate is used.

Permissible sizes of aggregate shall be governed by Table 4, except that when exposed aggregate surfaces are required, coarse aggregate gradation will be as specified on the plans.

When tested by approved methods, the coarse aggregate, including combinations of aggregates when used, shall conform to the grading requirements shown in Table 1.

TABLE 1  
Coarse Aggregate Gradation Chart

Aggregate Grade No.	Nominal Size	Percent Retained on each Sieve								No. 4	No. 8
		20 In.	2 In.	1- In.	1 In.	3/4 In.	1/2 In.	3/8 In.			
1	2 in.	0	0	15 to 20	60 to 80					95 to 100	
2 (467)*	1-1/2 in.		0	0 to 5	30 to 65			70 to 90		95 to 100	
4 (57)*	1 in.			0 to 5	40 to 75					90 to 100	95 to 100
8	3/8 in.						0	0 to 5		35 to 80	90 to 100

\*Numbers in parenthesis indicate conformance with ASTM C33.

The aggregate shall be washed. The Loss by Decantation (Test Method Tex-406-A) plus the allowable weight of clay lumps, shall not exceed one percent, or the value shown on the plans, whichever is smaller.

(4) Fine Aggregate

Fine aggregate shall consist of clean, hard, durable and uncoated particles of natural or manufactured sand or a combination thereof, with or without a mineral filler. It shall be free from frozen material or injurious amounts of salt, alkali, vegetable matter or other objectionable material and it shall not contain more than 0.5 percent by weight of clay lumps. When subjected to the color test for organic impurities (Test Method Tex-408-A), it shall not show a color a darker than standard.

The fine aggregate shall produce a mortar having a tensile strength equal to or greater than that of Ottawa sand mortar when tested in accordance with Test Method Tex-317-D.

Where manufactured sand is used in lieu of natural sand for slab concrete subject to direct traffic, the acid insoluble residue of the fine aggregate shall be not less than 28 percent by weight when tested in accordance with Test Method Tex-612-J.

When tested by approved methods, the fine aggregate or combinations of aggregates, including mineral filler, shall conform to the grading requirements shown in Table 2.

Table 2  
Fine Aggregate Gradation Chart

Aggregate Grade No.	3/8 In.	Percent Retained on Each Sieve						
		No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200
1	0	0 to 5	0 to 20	15 to 50	35 to 75	70 to 90	90 to 100	97 to 100

**NOTE 1:** Where manufactured sand is used in lieu of natural sand, the percent retained on the No. 200 sieve shall be 94 to 100.

**NOTE 2:** Where the sand equivalent value is greater than 85, the retainage on the No. 50 sieve may be 70 to 94 percent.

Fine aggregate will be subjected to the Sand Equivalent Test (Test Method Tex-203-F). The sand equivalent shall not be less than 80 nor less than the value shown on the plans, whichever is greater.

For Class A and C and E Concrete, the fineness modulus as defined below for fine aggregates shall be between 2.30 and 3.10.

The fineness modulus will be determined by adding the percentages by weight retained on the following sieves, and dividing by 100; Nos. 4, 8, 16, 30, 50 and 100.



(5) Mineral Filler

Mineral filler shall consist of stone dust, clean crushed sand, or other approved inert material.

(6) Mortar (Grout)

Mortar for repair of concrete shall consist of 1 part cement, 2 parts finely graded sand, and enough water to make the mixture plastic. When required to prevent color difference, white cement shall be added to produce the color required. When required by the Engineer, latex adhesive shall be added to the mortar.

(7) Admixtures

Calcium Chloride will not be permitted. Unless otherwise noted, air-entraining, retarding and water reducing admixtures may be used in all concrete and shall conform to the following requirements:

A "water-reducing, retarding admixture" is defined as a material which, when added to a concrete mixture in the correct quantity, will reduce the quantity of mixing water required to produce concrete of a given consistency and will retard the initial set of the concrete.

A "water-reducing admixture" is defined as a material which, when added to a concrete mixture in the correct quantity, will reduce the quantity of mixing water required to produce concrete of a given consistency.

(a) Retarding and Water Reducing Admixtures. The admixture shall meet the requirements for Type A and Type D admixture as specified in ASTM Designation: C 494, modified as follows:

- (1) The water-reducing retarder shall retard the initial set of the concrete a minimum of 2 hours and a maximum of 4 hours, at a specified dosage rate, at a temperature of 90° F.
- (2) The cement used in any series of tests shall be either the cement proposed for specific work or a "reference" Type I cement from one mill.
- (3) Unless otherwise noted on the plans, the minimum relative durability factor shall be 80.

The air entraining admixture used in the referenced and test concrete shall be neutralized Vinsol resin.

(b) Air Entraining Admixture. The admixture shall meet the requirements of ASTM Designation: C 260 modified as follows:

- (1) The cement used in any series of tests shall be either the cement proposed for specific work or a "reference" Type I cement from one mill.
- (2) Unless otherwise noted on the plans, the minimum relative durability factor shall be 80.

The air entraining admixture used in the referenced concrete shall be neutralized Vinsol resin.

3. STORAGE OF CEMENT

All cement shall be stored in well ventilated weatherproof buildings or approved bins, which will protect it from dampness or absorption of moisture. Storage facilities shall be ample, and each shipment of packaged cement shall be kept separated to provide easy access for identification and inspection.

The Engineer may permit small quantities of sacked cement to be stored in the open for a maximum of 48 hours on a raised platform and under waterproof covering.

#### 4. STORAGE OF AGGREGATE

The method of handling and storing concrete aggregate shall prevent contamination with foreign materials. If the aggregates are stored on the ground, the sites for the stock piles shall be clear of all vegetation and level. The bottom layer of aggregate shall not be disturbed or used without recleaning.

When conditions require the use of two or more sizes of aggregates, they shall be separated to prevent intermixing. Where space is limited, stock piles shall be separated by physical barriers.

Methods of handling aggregates during stockpiling and subsequent use shall be such that segregation will be minimized.

Unless otherwise authorized by the Engineer, all aggregate shall be stockpiled at least 24 hours to reduce the free moisture content.

#### 5. MEASUREMENT OF MATERIALS

The measurement of the materials, except water, used in batches of concrete shall be by weight. The fine aggregate, coarse aggregate and mineral filler shall be weighed separately. Where bulk cement is used it shall be weighed separately but batch weighing of sacked cement will not be required. Where sacked cement is used, the quantities of material per batch shall be based upon using full bags of cement. Batches involving the use of fractional bags will not be permitted.

Allowance shall be made for the water content in the aggregates.

Bags of cement varying more than 3 percent from the specified weight of 94 pounds may be rejected, and when the average weight per bag in any shipment, as determined by weighing 50 bags taken at random, is less than the net weight specified, the entire shipment may be rejected. If the shipment is accepted, the Engineer will adjust the concrete mix to a net weight per bag fixed by an average of all individual weights which are less than the average weight determined from the total number weighed.

#### 6. CLASSIFICATION AND MIX DESIGN

It shall be the responsibility of the Contractor to furnish the mix design, using a Coarse Aggregate Factor acceptable to the Engineer, for the class (es) of concrete specified. The mix shall be designed by a qualified concrete technician to conform with the requirement contained herein and in accordance with the THD Bulletin C-11. The Contractor shall perform, at his own expense, the work required to substantiate the design, except the testing of strength specimens, which will be done by the Engineer. Complete concrete design data shall be submitted to the Engineer for approval.

It shall also be the responsibility of the Contractor to determine and measure the batch quantity of each ingredient, including all water, so that the mix conforms to these specifications and any other requirements shown on the plans.

In lieu of the above mix design responsibility, the Contractor may accept a design furnished by the Engineer, however, this will not relieve him of

providing concrete meeting the requirements of these specifications.

Trial batches will be made and tested using all the proposed ingredients prior to the placing of concrete, and when the aggregate and/or brand of cement or admixture is changed. Trial batches shall be made in the mixer to be used on the job. When Transit Mix concrete is to be used, the trial designs will be made in a transit mixer representative of the mixers to be used. Batch size shall not be less than 50 percent of the rated mixing capacity of the truck.

Mix designs from previous or concurrent jobs may be used without trial batches if it is shown that no substantial change in any of the proposed ingredients has been made.

The coarse aggregate factor shall not be more than 0.82, except that when the voids in the coarse aggregate exceed 48 percent of the total dry loose volume, the coarse aggregate factor shall not exceed 0.85. The coarse aggregate factor shall not be less than 0.70 for Grades 1, 2 and 3 aggregate.

If the strength required for the class of concrete being produced is not secured with the cement specified in Table 4, the Contractor may use an approved water reducing or retarding admixture, or he shall furnish aggregates with different characteristics which will produce the required results. Additional cement may be required or permitted as temporary measure until the redesign is checked.

Water reducing or retarding agents may be used with all classes of concrete at the option of the Contractor.

When water reducing or retarding agents are used at the option of the Contractor, reduced dosage of the admixture will be permitted.

Entrained air will be required in accordance with Table 4. The concrete shall be designed to entrain 5 percent air when Grade 2 coarse aggregate is used and 6 percent when Grade 3 coarse aggregate is used. Concrete as placed in the structure shall contain the proper amount as required above with a tolerance of plus or minus 1-1/2 percentage points. Occasional variations beyond this tolerance will not be cause for rejection. When the quantity of entrained air is found to be above 7 percent with Grade 2 coarse aggregate or 8 percent for Grade 3 coarse aggregate, additional test beams or cylinders will be made. If these beams or cylinders pass the minimum flexural or compressive requirements, the concrete will not be rejected because of the variation in air content.

## 7. CONSISTENCY

In cases where the consistency requirements cannot be satisfied without exceeding the maximum allowable amount of water, the Contractor may use, or the Engineer may require, an approved water reducing or retarding agent or the Contractor shall furnish additional aggregates, or aggregates with different characteristics, which will produce the required results. Additional cement may be required or permitted as a temporary measure until aggregates are changed and designs checked with the difference aggregates or admixture.

The consistency of the concrete as placed should allow the completion of all finishing operations without the addition of water to the surface. When field conditions are such that additional moisture is needed for the final concrete surface finishing operation, the required water shall be applied to the surface by fog spray only, and shall be held to a minimum. The concrete shall be workable, cohesive, possess satisfactory finishing qualities, and of the stiffest consistency that can be placed and vibrated into a homogenous mass. Excessive bleeding shall be avoided. Slump requirements will be as specified in Table 3.

TABLE 3  
Slump Requirements

Concrete Designation	Desired Slump	Max. Slump
Structural Concrete		
(1) Thin-Walled Sections	4	5
(9" or less)	3	4
(2) Slabs, Caps, Columns, Piers, Wall Sections	5	6
9", etc.	2.5	4
Underwater or Seal Concrete		
Riprap, Curb, Gutter and Other Miscellaneous		

**NOTE:** No concrete will be permitted with slump in excess of the maximums shown.

## 8. QUALITY OF CONCRETE

### General

The concrete shall be uniform and workable. The cement content, maximum allowable water cement ration, the desired and maximum slump and the strength requirements of the various classes of concrete shall conform to the requirements of Table 3 and Table 4 and as required herein.

During the process of the work, the Engineer will cast test cylinders or beams as a check on the compressive or flexural strength of the concrete actually placed.

A test shall be defined as the average of the breaking strength of two cylinders or two beams, as the case may be. Specimen will be tested in accordance with Test Methods Tex-418-A or Tex-420-A.

Test beams or cylinders will be required as specified on the plans. For small placements on structures such as manholes, inlets, culverts, wingwalls, etc., the Engineer may vary the number of tests to a minimum of one for each 25 cubic yards placed over a several day period.

All test specimens, beams or cylinders, representing tests for removal of forms and/or falsework shall be cured using the same methods, and under the same conditions as the concrete represented.

"Design Strength" beams and cylinders shall be cured in accordance with THD Bulletin C-11.

The Contractor shall provide and maintain curing facilities as described in Bulletin C-11 for the purpose of curing test specimens. Provision shall be made to maintain the water in the curing tank at temperatures between 70° F and 90° F.

When control of concrete quality is by twenty-eight day compressive tests, job control will be by seven day compressive tests which are shown to provide the required twenty-eight day strength, based on results from trial batches. If the required seven day strength is not secured with the cement specified in Table 4, changes in the batch design will be made.

TABLE 4  
Classes of Concrete

Class of Concrete	Sx. Cement per C.Y.	Min. Comp Strength (f'c) 28 Day psi	Min. Beam Strength 7 Day psi	Max. Water Cement Ratio	Coarse Aggr. No.
A*	5.0	3000	500***	6.5	2-4-8****
B*	4.5	2500	417	8.0	2-4-8****
C*	6.0	3600	600***	6.0	1-2-4**
D	6.0	3000	500	7.0	2-4
S	6.5	4000	570	5.0	2-4

\*Entrained Air (slabs, pier and bent concrete)

\*\*Grade 1 coarse Aggregate may be used in foundation only (except cased drilled shafts)

\*\*\*When Type II Cement is used with Class C Concrete, the 7 day beam break requirement will be 550 psi; with Class A, 460 psi. min.

\*\*\*\*Permission to use Grade 8 Aggregate must have prior approval of the Engineer

#### 9. MIXING CONDITIONS

The concrete shall be mixed in quantities required for immediate use. Any concrete which is not in place within the limits outlined in specifications, Section 038000 "Concrete Structures", Article "Placing Concrete General", shall not be used. Retamping of concrete will not be permitted.

In threatening weather, which may result in conditions that will adversely affect quality of the concrete to be placed, the Engineer may order postponement of the work. Where work has been started and changes in weather conditions require protective measures, the Contractor shall furnish adequate shelter to protect the concrete against damage from rainfall, or from freezing temperatures. If necessary to continue operations during rainfall, the Contractor shall also provide protective coverings for the material stock piles. Aggregate stock piles need be covered only to the extent necessary to control the moisture conditions in the aggregates to adequately control the consistency of the concrete.

#### 10. MIXING AND MIXING EQUIPMENT

(a) All equipment, tools, and machinery used for hauling materials and performing any part of the work shall be maintained in such condition to insure completion of the work under way without excessive delays for repairs or replacements.

The mixing shall be done in a batch mixer of approved type and size that will produce uniform distribution of the material throughout the mass. Mixers may be either the revolving drum type or the revolving blade type, and shall be capable of producing concrete meeting the requirements of

these specifications.

After all the ingredients are assembled in the drum, the mixing shall continue not less than 1 minute for mixers of one cubic yard or less capacity plus 15 seconds for each additional cubic yard or portion thereof.

The mixer shall operate at the speed and capacity designated by the Mixer Manufacturers Bureau of the Associated General Contractors of America. The mixer shall have a plate affixed showing the manufacturer's recommended operating data.

The absolute volume of the concrete batch shall not exceed the rated capacity of the mixer.

The entire contents of the drum shall be discharged before any materials are placed therein for the succeeding batch.

The first batch of concrete materials placed in the mixer for each placement shall contain an extra quantity of sand, cement, and water sufficient to coat the inside surface of the drum.

Upon the cessation of mixing for any considerable length of time, the mixer shall be thoroughly cleaned.

The concrete mixer shall be equipped with an automatic timing device which is put into operation when the skip is raised to its full height and dumping. This device shall lock the discharging mechanism and prevent emptying of the mixer until all the materials have been mixed together for the minimum time required, and it shall ring a bell after the specified time of mixing has elapsed.

The water tank shall be arranged so that the amount of water can be measured accurately, and when the tank starts to discharge, the inlet supply shall cut off automatically.

Whenever a concrete mixer is not adequate or suitable for the work, it shall be removed from the site upon a written order from the Engineer and a suitable mixer provided by the Contractor.

Pick-up and thro-over blades in the drum of the mixer which are worn down more than 10 percent in depth shall be repaired or replaced by new blades.

Improperly mixed concrete shall not be placed in the structure.

Job mix concrete shall be concrete mixed in an approved batch mixer in accordance with the requirements stated above, adjacent to the structure for which the concrete is being mixed, and moved to the placement site, in non-agitating equipment.

## 11. READY-MIX PLANTS

A. General. It shall be the Contractor's responsibility to furnish concrete meeting all requirement of the governing specifications items and concrete not meeting the slump, workability and consistency requirements of the governing specification item shall not be placed in the structure or pavement.

Ready-Mixed Concrete shall be mixed and delivered by means of one of the following approved methods.

- (1) Mixed completely in a stationary mixer and transported to the point of delivery in a truck agitator or a truck mixer

operating at agitator or a truck mixer operating at agitation speed. (Central-Mix Concrete)

- (2) Mixed complete in a truck mixer and transported to the placement site at mixing and/or agitating speed (Transit-Mix Concrete), subject to the following provisions.
  - (a) Truck mixers will be permitted to transport concrete to the job site at mixing speed if equipped with double actuated counters which will separate revolutions at mixing speed from total revolutions.
  - (b) Truck mixers equipped with a single actuated counter counting total revolutions of the drum shall mix the concrete at the plant not less than 50 nor more than 70 revolutions at mixing speed, transport it to the job site at agitating speed and complete the required mixing before placing the concrete.
- (3) Mixed completely in a stationery mixer and transported to the job site in approved non-agitating trucks with special bodies. This method of transporting will be permitted for concrete pavement only.

B. Equipment

- (1) Batching Plant. The batching plant shall be provided with adequate bins for batching all aggregates and materials required by the specifications.

Bulk cement shall be weighed on a scale separate from those used for other materials and in a hopper entirely free and independent of that used for weighing the aggregates.

- (2) Mixers and Agitators.

- (a) General: Mixers shall be of an approved stationary or truck-type capable of combining the ingredients into a thoroughly mixed and uniform mass.

Facilities shall be provided to permit ready access to the inside of the drum for inspection, cleaning and repair of blades.

Mixers and agitators shall be subject to daily examination for changes in condition due to accumulation of hardened concrete and/or wear of blades and any hardened concrete shall be removed before the mixer will be permitted to be used. Worn blades shall be repaired or replaced with new in accordance with the manufacturer's design and arrangement for that particular unit when any part or section is worn as much as 10 percent below the original height of the manufacturer's design.

- (b) Stationary Mixers: These shall conform to the requirements of Article "Mixing and Mixing Equipment". Truck mixers mounted on a stationary base will not be considered as a stationary mixer.
- (c) Truck Mixer: In addition, truck mixers shall comply with the following requirements:

An engine in satisfactory working condition and capable of accurately growing the desired speed of rotation shall be mounted as an integral part of the mixing unit for the purpose of rotating the drum. Truck mixers equipped with a transmission that will govern the speed of the drum within the specified rpm will not require a separate engine.

All truck mixers shall be equipped with actuated counters by which the proper number of revolutions of the drum as specified in "Part A" above may be readily verified. The counters shall be read and recorded at the start of mixing at mixing speeds.

Each until shall have adequate water supply and accurate metering or gauging devices for measuring the amount used.

- (d) Agitators: Concrete agitators shall be of the truck type, capable of maintaining a thoroughly mixed and uniform concrete mass and discharging it within the same degree of uniformity specified for mixers. Agitators shall comply with all of the requirements for truck mixers, except for the actual mixing requirements.

### C. Operation of Plant and Equipment

Delivery of ready-mixed concrete shall equal or exceed the rate approved by the Engineer for continuous placement. In all cases, the delivery of concrete to the placement site shall assure compliance with the time limits in the applicable specification for depositing successive batches in any monolithic unit. The Contractor shall satisfy the Engineer that adequate standby trucks are available.

A standard ticket system will be used for recording concrete batching, mixing and delivery date.

Tickets will be delivered to the job inspector.

Loads arriving without ticket and/or in unsatisfactory condition shall not be used.

When a stationary mixer is used for the entire mixing operation, the mixing time for one cubic yard of concrete shall be one minute plus 15 seconds for each additional cubic yard or portion thereof. This mixing time shall start when all cement, aggregates and initial water have entered the drum. The mixer shall be charged so that some of the mixing water will enter the drum in advance of the cement and aggregate. All of the mixing water shall be in the drum by the end of the first one-fourth of the specified mixing time. Water used to flush down the blades after charging shall be accurately measured and included in the quantity of mixing water. The introduction of the initial mixing water, except blade wash down water and that permitted in this Article, shall be prior to or simultaneous with the charging of the aggregates and cement.

The loading of truck mixers shall not exceed 63 percent of the total volume of the drum. When used as an agitator only, the loading shall not exceed 80 percent of the drum volume.

When Ready-Mix Concrete is used, additional mortar (one sack cement, three parts sand and sufficient water) shall be added to the batch to coat the drum of the mixer or agitator truck and this shall be required for every load of Class C concrete only and for the first batch from central mix plants.



A portion of the mixing water, required by the batch design to produce the desired slump, may be withheld and added at the job site, but only with permission of the Engineer and under his supervision. When water is added under the above conditions, it shall be thoroughly mixed as specified below for water added at the job site.

Mixing speed shall be attained as soon as all ingredients are in the mixer, and each complete batch (containing all the required ingredients) shall be mixed not less than 70 nor more than 100 revolutions of the drum at mixing speed except that when water is added at the job site, 25 revolutions (minimum) at mixing speed, will be required to uniformly disperse the additional water throughout the mix. Mixing speed shall be as designated by the manufacturer.

All revolutions after the prescribed mixing time shall be at agitating speed. The agitating speed shall be not less than one nor more than 5 rpm. The drum shall be kept in continuous motion from the time mixing is started until the discharge is completed.

#### 12. PLACING, CURING AND FINISHING

The placing of concrete, including construction of forms and falsework, curing and finishing, shall be in accordance with the specification, Section 038000 "Concrete Structures".

#### 13. MEASUREMENT & PAYMENT

The quantities of concrete of the various classifications which will constitute the completed and accepted structure of structures in place will be measured by the cubic yard, each, square foot, square yard, or linear foot as the case may be. Measurement will be as shown on the plans and in the proposal.

Unless indicated otherwise in the proposal, payment shall be compensation for finishing, hauling, and mixing all concrete material; placing, curing and furnishing all concrete; all grouting and pointing; furnishing and placing drains; furnishing and placing metal flashing strips; furnishing and placing expansion joint material required by this specification; and for all forms and falsework, labor, tools, equipment, and incidentals necessary to complete the work.

SECTION 032020  
REINFORCING STEEL (S-42)

1. DESCRIPTION

This specification shall govern the furnishing and placing of reinforcing steel, deformed and smooth, of the size and quantity designated on the plans and in accordance with these specifications.

2. MATERIALS

Unless otherwise designated on the plans, all bar reinforcement shall be deformed, and shall conform to ASTM Designation: A 615, Grades 40, 60 and 75, and shall be open hearth, basic oxygen, or electric furnace new billet steel.

Large diameter new billet steel (Nos. 14 and 18), Grade 75, will be permitted for straight bars only.

Where bending of bar sizes No. 14 or No. 18 of Grades 40 and 60 is required, bend testing shall be performed on representative specimens as described for smaller bars in the applicable ASTM Specification. The required bend shall be 90 degrees around a pin having a diameter of 10 times the nominal diameter of the bar.

Spiral reinforcement shall be smooth (not deformed) bars or wire of the minimum diameter shown on the plans, and shall be made by one or more of the following processes: open hearth, basic oxygen, or electric furnace. Bars shall be rolled from billets reduced from ingots and shall comply with ASTM, Designation: A 306, Grade 65 minimum (Referenced to ASTM Designation: A 29 is voided. Dimensional tolerances shall be in accordance with ASTM Designation: A 615, or ASTM Designation: A 615, Grade 40 or 60, except for deformations. Wire shall be cold-drawn from rods that have been hot-rolled from billets and shall comply with ASTM Designation: A 185.

In cases where the provisions of this specifications are in conflict with the provisions of the ASTM Designation to which reference is made, the provisions of this specification shall govern.

Report of chemical analysis showing the percentages of carbon, manganese, phosphorus and sulphur will be required for all reinforcing steel, when it is to be welded.

The nominal size and area and the theoretical weight of reinforcing steel bars covered by this specification is as follows:

<u>Bar Size Number</u>	<u>Nominal Diameter In.</u>	<u>Nominal Area Sq. In.</u>	<u>Weight Per Linear Foot</u>
2	0.250	0.05	0.167
3	0.375	0.11	0.376
4	0.500	0.20	0.668
5	0.625	0.31	1.043
6	0.750	0.44	1.502
7	0.875	0.60	2.044
8	1.000	0.79	2.670

9	1.128	1.00	3.400
10	1.270	1.27	4.303
11	1.410	1.56	5.313
14	1.693	2.25	7.6
18	2.257	4.00	13.60

Smooth round bars shall be designated by size number through No. 4. Smooth bars above No. 4 shall be designated by diameter in inches.

When wire is ordered by gauge numbers, the following relation between number and diameter, in inches, shall apply unless otherwise specified:

<u>Gauge Number</u>	<u>Equivalent Diameter Inches</u>	<u>Gauge Number</u>	<u>Equivalent Diameter Inches</u>
0	0.3065	8	0.1620
1	0.2830	9	0.1483
2	0.2625	10	0.1350
3	0.2437	11	0.1205
4	0.2253	12	0.1055
5	0.2070	13	0.0915
6	0.1920	14	0.0800
7	0.1770		

### 3. BENDING

The reinforcement shall be bent cold, true to the shapes indicated on the plans. Bending shall preferably be done in the shop. Irregularities in bending shall be cause for rejection.

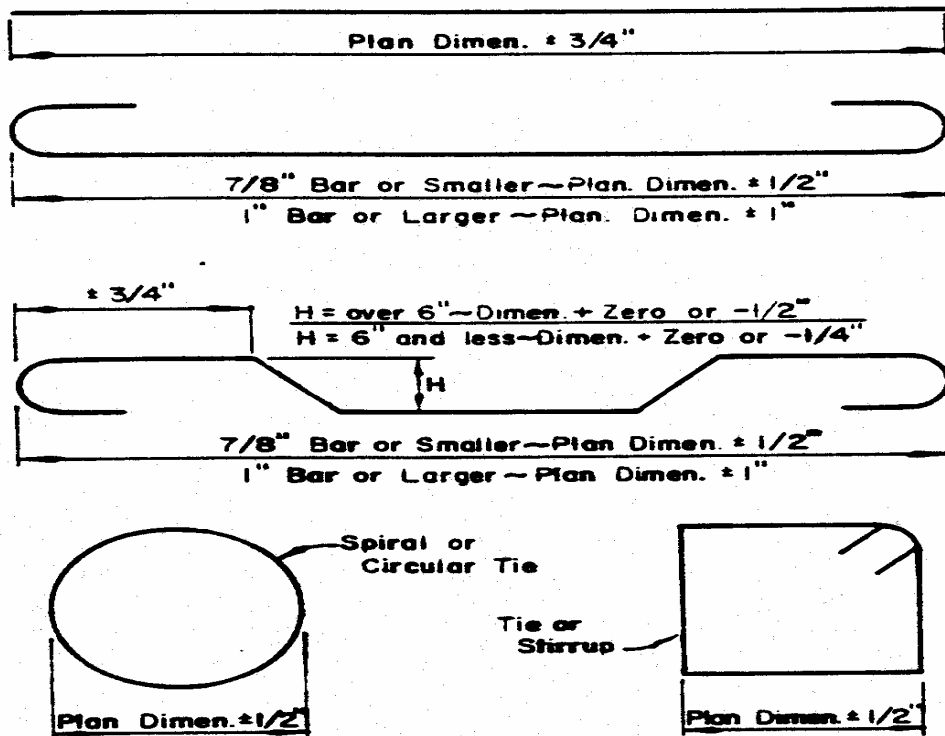
Unless otherwise shown on the plans, the inside diameter of bar bends, in terms of the nominal bar diameter (d), shall be as follows:

Bends of 90° and greater in stirrups, ties and other secondary bars that enclose another bar in the bend.

	<u>Grade 40</u>	<u>Grade 60</u>	
#3, #4, #5	3d	4d	
#6, #7, #8	4d	5d	
All bends in main bars and in secondary bars not covered above.			
	<u>Grade 40</u>	<u>Grade 60</u>	<u>Grade 75</u>
#3 thru #8	5d	6d	--
#9, #10	5d	8d	--
#11	5d	8d	8d
#14, #18	10d	10d	--

#### 4. TOLERANCES

Fabricating Tolerances for bars shall be within 3% of specified or as follows:



#### 5. STORING

Steel reinforcement shall be stored above the surface of the ground upon platforms, skids, or other supports and shall be protected as far as practicable from mechanical injury and surface deterioration caused by exposure to conditions producing rust. When placed in the work, reinforcement shall be free from dirt, paint, grease, oil, or other foreign materials. Reinforcement shall be free from injurious defects such as cracks and laminations. Rust, surface seams, surface irregularities or mill scale will not be cause for rejection, provided the minimum dimensions, cross-sectional area and tensile properties of a hand wire crushed specimen meets the physical requirements for size and grade of steel specified.

#### 6. SPLICES

No splicing of bars, except when provided on the plans or specified herein, will be permitted without written approval of the Engineer. Splices not provided for on the plans will be permitted, but not included for measurement, in Grade 40 bars only, sizes No. 8 and smaller, subject to the following:

For bars exceeding 40 feet in plan length, the distance center to center of splices shall not be less than 40 feet and no individual bar length shall be less than 10 feet. Splices will not be permitted in bars less than 40 feet in plan length. Splices which are not shown on the plans, but permitted hereby, shall be made in accordance with Table 1 below. The specified concrete cover shall be maintained at such splices and the bars placed in contact and securely tied together.

Splices will not be permitted in main reinforcement at points of maximum stress. When permitted in main bars, splices in adjacent bars will be staggered a minimum of two splice lengths.

TABLE 1  
Minimum Lap Requirements

<u>Lap</u>		<u>Uncoated</u>	<u>Coated</u>
Lap in inches	$\geq$	40d	60d

Where d = Bar diameter in inches

Welding of reinforcing bars may be used only where shown on the plans or as permitted herein. All welding operations, processes, equipment, materials, workmanship, and inspection shall conform to the requirements of the plans and of the specification, Section

050200 "Structural Welding". All splices shall be of such dimension and character as to develop the full strength of bar being spliced.

End preparation for butt welding reinforcing bars, shall be done in the field. Delivered bars shall be of sufficient length to permit this practice.

For box culvert extensions with less than one foot of fill, the existing longitudinal bars shall have a 20 diameter lap with the new bars. For extensions with more than one foot of fill, a minimum of 6 inch lap will be required.

Unless otherwise shown on the plans, dowel bars transferring tensile stresses, shall have a minimum embedment equal to the minimum lap requirements shown in Table 1. Shear transfer dowels shall have a minimum embedment of 12 inches.

## 7. PLACING

Reinforcement shall be placed as near as possible in the position shown on the plans. Unless otherwise shown on the plans, dimensions shown for reinforcement are to the centers of the bars. In the plane of the steel parallel to the nearest surface of concrete, bars shall not vary from plan placement by more than one-twelfth of the spacing between bars. In the plane of the steel perpendicular to the nearest surface of concrete, bars shall not vary from plan placement by more than one-quarter inch. Cover of concrete to the nearest surface of steel shall meet the above requirements but shall never be less than one inch.

Vertical stirrups shall always pass around the main tensions members and be attached securely thereto. The reinforcing steel shall be spaced its required distance from the form surface by means of approved galvanized metal spacers, metal spacers with plastic coated tips, stainless steel spacers, plastic spacers, or approved pre-cast mortar or concrete blocks. For approval of plastic spacers on project, representative samples of the plastic shall show no visible indications of deterioration after immersion in a 5 percent solution of sodium hydroxide for 120 hours.

All reinforcing steel shall be sited at all intersections, except that where spacing is less than one foot in each direction, alternate intersections only, need be tied.

Before any concrete is placed, all mortar shall be cleaned from the reinforcement. Pre-cast mortar or concrete blocks to be used for holding steel in position adjacent to formed surfaces shall be cast in molds meeting the approval of the Engineer and shall be cured by covering with wet burlap or cotton mats for a period of 72 hours.

The blocks shall be cast in the form of a frustrum of a cone or pyramid with the smaller face placed against the forms.

A suitable tie wire shall be provided in each block, to be used for anchoring to the steel. Except in unusual cases, and when specifically otherwise authorized by the Engineer, the size of the surface to be placed adjacent to the forms shall not exceed two and one-half inches square or the equivalent thereof in cases where circular or rectangular areas are provided. Blocks shall be cast accurately to the thickness required, and the surface to be placed adjacent to the forms shall be a true plane free of surface imperfections.

Reinforcement shall be supported and tied in such manner that a sufficiently rigid cage of steel is provided. If the cage is not adequately supported to resist settlement or floating upward of the steel, overturning of truss bars, or movement in any direction during concrete placement, permission to continue concrete placement will be withheld until corrective measures are taken. Sufficient measurements shall be made during concrete placement to insure compliance with the first paragraph of this specification.

Mats of wire fabric shall overlap each other sufficiently to maintain a uniform strength and shall be fastened securely at the ends and edges.

No concrete shall be deposited until the Engineer has inspected the placement of the reinforcing steel and given permission to proceed.

#### 8. MEASUREMENT AND PAYMENT

Reinforcing steel is considered subsidiary to the various items shown in the proposal and shall not be measured and paid for as a separate item.

SECTION 036020  
STUCCO AND PLASTER (S-123)

1. GENERAL

This work includes lath, furring and stucco including all accessories conforming to details.

This Applicator shall show evidence of experience and competency in accomplishing plaster work of the highest workmanship, which is the requirement herein. All improper workmanship shall be removed and be replaced with proper workmanship at any stage of the work.

All manufactured materials shall be delivered in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name.

All cementitious material must be kept dry until ready for use, and must be kept off the ground, under cover, and away from any sweating walls or other damp surfaces.

2. LATHING MATERIALS

All lath for exterior stucco shall be galvanized, self-furring diamond lath weighing not less than 2.5 lbs. per square yard.

Tie wires shall be No. 16 gauge galvanized wire.

Apply lath over continuous 6 mil. polyethylene vapor barrier film.

3. ACCESSORIES

Accessories shall be zinc, and equal, in total value, to U.S.G. No. 1-A expanded corner bead; No. 60 or 66 expanded square casing bead; No. 10-A expanded bull nose corner bead; No. 15 and other expansion joints and other accessories as necessary for stopping plaster at all changes of plane or backup material. Use 1/2" beads on masonry; 3/4" beads on metal lath.

4. STUCCO MATERIALS

Stucco shall be applied in 3 coats, 3/4" thick on metal lath.

5. PORTLAND CEMENT EXTERIOR PLASTER

Portland cement exterior plaster (where stucco is called for) shall be a 3 coat system, buff colored. Submit samples to Engineer's satisfaction. Approximate color sample may be seen at Engineer's office by interested parties. Submit sample to match.

6. SCRATCH COAT

Scratch Coat - one sack Portland cement, two sacks equal to U.S.G. Bondcrete lime, 7 $\square$  cubic feet sand and 2 lbs. fiber. Scratch surface and damp cure for 48 hours minimum.

7. BROWN COAT

Brown Coat - same proportions and materials as scratch coat except use 9 cu.ft. sand finish. Damp cure 48 hours minimum.

#### 8. FINISH COAT

Finish Coat - 1/8" thick, equal, in total value, to U.S.G. Exterior Stucco, with color added, receiving sand finish.

#### 9. PATCHING AND POINTING

Upon completion of the building and when directed, all loose, cracked, damaged, or defective plastering shall be cut out and replastered in a satisfactory and approved manner. All pointing and patching of plastered surfaces, and where plastering abuts or adjoins any other finished work, shall be done in a neat and workmanlike manner. Plaster droppings or splatterings shall be removed from all surfaces. Exposed plastered surfaces shall be left in clean, unblemished condition ready to receive paint or other finish. Protective covering shall be removed from floors and other surfaces, and all rubbish and debris shall be removed from the building.

Finish coat of all plaster work shall be properly damp cured according to directions of the manufacturer of the materials used.

The repairing of damage to plaster work caused by other trades shall be done by this Applicator and shall be paid for by the trade responsible for the damage.

Do not apply plaster below 55° F. temperature.

#### 10. CLEANING AND PATCHING

Clean floors of droppings immediately after each coat is applied. At any exterior locations, remove droppings or splashes from all concrete, masonry or other finish surfaces.

Patch after all other work except painting has been completed. Cut out damaged or broken plaster to straight lines with clean, sharp edges. Cut out cracks to width of at least 1-inch. Fill areas to be patched with vase materials, then give a finish coat of same material as adjoining plaster. Patched areas shall match adjoining work in finish and texture. Joinings shall be flush and smooth so joints between patch and existing plaster are imperceptible.



SECTION 37040  
EPOXY COMPOUNDS (S-44)

1. DESCRIPTION

This specification shall govern all work necessary to provide and apply Epoxy compounds.

2. MATERIALS (USE - TYPE)

- (1) Epoxy Bonding Compound for bonding new concrete to hardened concrete or other structural material: Epoxy Bonding Compound shall be a two component, 100% solids, moisture insensitive system. Epoxy shall be "FX-75 Bonding Agent" as manufactured by Fox Industries Inc. of Baltimore, Maryland or "Sikastix 370, Sikadur Hi-Mod" as manufactured by Sika Chemical Corporation of Lyndhurst, New Jersey or approved equal.
- (2) Epoxy Grout for Epoxy patch on non-horizontal surfaces to concrete: Epoxy Compound shall be a low-modulus, high viscosity, moisture insensitive system. Epoxy shall be "Sikastix 360, Skadur Lo-Mod Gel" as manufactured by Sika Chemical Corporation, or approved equal.

3. CONSTRUCTION METHODS

- (1) Bond new concrete to existing concrete:
  - a. Surface Preparation: The existing concrete or structural surface to which the new concrete is to be bonded shall be cleaned. The existing surface shall be made free from dust, laitance, grease, curing compounds, waxes and all foreign material. Cleaning shall be done by sandblasting, mechanical abrasion, or (by washing only if authorized by the Engineer). During application of bonding compound, surface may be dry, moist, or wet, but surface shall be free of standing water.
  - b. Proportioning and Mixing: The epoxy shall be proportioned and mixed in strict accordance with the manufacturers instructions. The epoxy shall be used in a neat condition (without aggregate filler).
  - c. Application of Epoxy: The epoxy bonding compound shall be applied to the prepared surface with the minimum allowable coverages as follows:

Concrete (float finished, cleaned by washing) 75 SF/gal

Concrete (rough finish, cleaned by sandblast or mechanical abrasion) 50 SF/gal

Other surfaces as specified on the drawings
  - d. Concrete Overlay: The concrete overlay shall be in accordance with the drawings or 030020 of standard specifications. The concrete overlay shall be applied over the epoxy within a period of time which SHALL NOT EXCEED 60% of the tack free time of the epoxy. It is important for the Contractor to note that these times vary with the temperature and pot time. The following allowable times (60% of tack free time, where the tack free time is the period of time from initial mixing of the two components until the thin film of epoxy hardens) are provided below. The allowable times must be determined from the tack free times which are provided by the

manufacturer. The following allowable times are averages and provided only as an aid to the Contractor:

Temperature	Allowable Elapse Time from Mixing Epoxy Until Placing Concrete Overlay
90°F	40 min.
80°F	1½ hrs.
70°F	2½ hrs.
60°F	3½ hrs.

If the allowable period of time is allowed to elapse before concrete overlay can be placed, another layer of epoxy shall be applied prior to placement of the concrete.

(2) Epoxy Grout for patch to non-horizontal surfaces to concrete:

- a. Surface Preparation: The surface shall be prepared as described in (1) Bond new concrete to existing concrete Part a.
- b. Proportioning and Mixing: The epoxy shall be proportioned and mixed in strict accordance with the manufacturer instruction. The epoxy may be mixed with dry masonry sand. Sand shall conform to A.S.T.M. C-144 with 100% passing a No. 8 sieve and not more than 15% to 35% passing a No. 50 mesh sieve. The amount of sand filler shall not exceed 3/4 to 1 (loose sand to epoxy by volume).
- c. Application: Epoxy shall be applied in strict accordance with manufacturer instructions. Area adjacent to work shall be cleaned free of epoxy spills as to provide a neat appearance before work will be accepted.

#### 4. GENERAL PRECAUTION

The Contractor is advised to become familiar with type of epoxy, method of application, and its basic limitations prior to using the epoxy.

#### 5. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, Epoxy Compounds shall be considered subsidiary to the appropriate bid item.

SECTION 038000  
CONCRETE STRUCTURES (S-41)

1. DESCRIPTION

This specification shall govern for construction of all types of structures involving the use of structural concrete, except where the requirements are waived or revised by other governing specifications.

All concrete structures shall be constructed in accordance with the design requirements and details shown on the plans; in conformity with the pertinent provisions of the items contracted for; the incidental specifications referred to; and in conformity with the requirements herein.

2. MATERIALS

(1) Concrete. All concrete shall conform to the provisions of the specification, "Portland Cement Concrete".

The class of concrete for each type of structure or unit shall be as specified on the plans, or by pertinent governing specifications.

(2) Expansion Joint Material

(a) Preformed Fiber Material. Preformed fiber expansion joint material shall be of the dimensions shown on the plans. At the Contractor's option, the material shall be one of the following types, unless otherwise noted on the plans:

1. "Preformed Bituminous Fiber Materials" shall meet the requirements of the Standard Specifications for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction, ASTM Designation: D1751.
2. "Preformed Non-Bituminous Fiber Material" shall meet the requirements of the Standard Specifications for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction, ASTM Designation: D1751, except that the requirements pertaining to bitumen content, density and water absorption shall be voided.

(b) Joint Sealing Materials. Unless otherwise shown on the plans, joint sealing material shall conform to the following requirements. The material shall adhere to the sides of the concrete joint or crack and shall form an effective seal against infiltration of water and incompressible. The material shall not crack or break when exposed to low temperatures.

1. Class 1-a. (Two component, Synthetic Polymer, Cold Extruded Type). Curing is to be by polymerization and not by evaporation of solvent or fluxing of harder particles. This type is specifically designed for vertical or sloping joints and hence not self leveling. It shall cure sufficiently at an average temperature leveling. It shall cure sufficiently at an average temperature of 77° F ± 3 F maximum of 24 hours. For performance requirements see under b-2 below.
2. Class 1-b. (Two component, Synthetic Polymer, Cold Pourable, Self Leveling Type). Curing is to be by polymerization and not by evaporation of solvent or fluxing of harder particles. It shall cure sufficiently at an average temperature of 77° F ± 3

F maximum of 3 hours.

Performance Requirements. Class 1-a and 1-b, when tested in accordance with Test Method Tex-525-C, shall meet the above curing times and requirements as follows:

It shall be of such consistency that it can be mixed and poured, or mixed and extruded into joints at temperatures above 60 F.

Penetration, 77° F.	
150 gm. cone, 5 sec., max.-cm.....	0.90
Bond and Extension 75%, 0° F, 5 cycles	
Dry Concrete Blocks.....	Pass
Wet Concrete Blocks.....	Pass
Steel Blocks...(Primed if specified by Manuf.)	Pass
Flow at 200° F.....	None
Water Content % by weight, max.....	5.0
Resilience	
Original sample min. % (cured).....	50
Oven aged at 158° F min. % .....	50
For Class 1-a Material Only	
Cold Flow (10 min.).....	None

(c) Asphalt Board. Asphalt Board shall consist of two liners of 0.016 inch asphalt impregnated paper, filled with a mastic mixture of asphalt and vegetable fiber and/or mineral filler. Boards shall be smooth, flat and sufficiently rigid to permit installation. When tested in accordance with Test Method Tex-524-C, the asphalt board shall not deflect from the horizontal more than one inch in three and one-half inches.

(b) Rebonded Neoprene Filler. Rebonded neoprene filler shall consist of ground closed-cell neoprene particles, rebonded and molded into sheets of uniform thickness of the dimensions shown on plans.

Filler material shall have the following physical properties and shall meet the requirements of ASTM Designation: D1752, Type 1 where applicable:

<u>PROPERTY</u>	<u>METHOD</u>	<u>REQUIREMENT</u>
Color	ASTM D1752 Type 1	Black
Density	ASTM D1752 Type 1	40 PCF Min
Recovery	ASTM D1752 Type 1	90% Min.
Compression	ASTM D1752 Type 1	50 to 500 psi
Extrusion	ASTM D1752 Type 1	0.25 In. Max.
Tensile Strength	ASTM D1752 Type 1	20 psi Min.
Elongation		75% Min

The manufacturers shall furnish the Engineer with certified test results as to the compliance with the above requirements and a 12 inch x 12 inch x 1 inch sample from the shipment for approval.

(3) Curing Materials

- (a) Membrane curing materials shall comply with the "Standard Specification Liquid Membrane-Forming Compounds for Curing Concrete", ASTM Designation: C 309, Type 1 clear or translucent, or Type 2 white pigmented. The material shall have a minimum flash-point of 80° F when tested by the "Pensky-Martin Closed Cup Method".

It shall be of such consistency that it can be satisfactorily applied as a fine mist through an atomizing nozzle by means of approved pressure spraying equipment at atmospheric temperatures above 40° F.

It shall be of such nature that it will not produce permanent discoloration of concrete surfaces nor react deleteriously with the concrete or its components. Type 1 compound shall contain a fugitive dye that will be distinctly visible not less than 4 hours nor more than 7 days after application. The compound shall produce a firm, continuous, uniform moisture impremeable film free from pinholes and shall adhere satisfactorily to the surfaces of damp concrete. It shall, when applied to the damp concrete surface, at the rate of coverage specified herein, dry to touch in not more than 4 hours and shall adhere in a tenacious film without running off or appreciable sagging. It shall not disintegrate, check, peel or crack during the required curing period.

The compound shall not peel or pick up under traffic and shall disappear from the surface of the concrete by gradual disintegration.

The compound shall be delivered to the job only in the manufacturer's original containers, which shall be clearly labeled with the manufacturer's name, the trade name of the material, and a batch number or symbol with which test samples may be correlated.

The water retention test shall be in accordance with Test Method Tex-219-F. Percentage loss shall be defined as the water lost after the application of the curing material was applied. The permissible percentage moisture loss (at the rate of coverage specified herein) shall not exceed the following:

24 hours after application.....	2 percent
72 hours after application.....	4 percent

Type 1 (Resin Base Only) curing compound will be permitted for slab concrete in bridge decks and top slabs of direct traffic culverts.

- (b) Mat curing of concrete is allowed where permitted by Table 1 in this specification or where otherwise approved by the Engineer.

3. EXPANSION JOINTS

Joints and devices to provide for expansion and contraction shall be constructed where and as indicated herein or on the plans.

All open joints and joints to be filled with expansion joint material, shall be constructed using forms adaptable to loosening or early removal. To avoid expansion or contraction damage to the adjacent concrete, these forms shall be loosened as soon as possible after final concrete set to permit free movement without requiring full form removal.

Prior to placing the sealing material, the vertical facing the joint shall be cleaned of all laitance by sandblasting or by mechanical routing. Cracked or spalled edges shall be repaired. The joint shall be blown clean of all foreign

material and sealed.

Where preformed fiber joint material is used, it shall be anchored to the concrete on one side of the joint by light wire or nails, to prevent the material from falling out. The top one inch of the joint shall be filled with joint sealing material.

Finished joints shall conform to the indicated outline with the concrete sections completely separated by the specified opening or joint material.

Soon after form removal and again where necessary after surface finishing, all projecting concrete shall be removed along exposed edges to secure full effectiveness of the expansion joints.

#### 4. CONSTRUCTION JOINTS

The joint formed by placing plastic concrete in direct contact with concrete that has attained its initial set shall be deemed a construction joint. The term monolithic placement shall be interpreted to mean at the manner and sequence of concrete placing shall not create construction joints.

Construction joints shall be of the type and at the locations shown on the plans. Additional joints will not be permitted without written authorization from the Engineer, and when authorized, shall have details equivalent to those shown on the plans for joints in similar locations.

Unless otherwise provided, construction joints shall be square and normal to the forms. Bulkheads shall be provided in the forms for all joints, except when horizontal.

Construction joints requiring the use of joint sealing material shall be as detailed on the plans. The material will be specified on the plans without referenced to joint type.

A concrete placement terminating at a horizontal construction joint shall have the top surface roughened thoroughly as soon as practicable after initial set is attained. The surfaces at bulkheads shall be roughened as soon as the forms are removed.

The hardened concrete surface shall be thoroughly cleaned of all loose material, laitance, dirt or foreign material and saturated with water so it is moist when placing fresh concrete against it. Forms shall be drawn tight against the placing of the fresh concrete.

#### 5. FORMS

- (1) General. Except where otherwise specified, forms may be of either timber or metal.

Forms for round columns exposed to view shall be of steel, except that other materials will be allowed with written permission of the Engineer.

Forming plans shall be submitted to the Engineer for approval as specified. Forms shall be designed for the pressure exerted by a liquid weighing 150 pounds per cubic foot. The rate of placing the concrete shall be taken into consideration in determining the depth of the equivalent liquid. For job fabricated forms, an additional live load of 50 pounds per square foot shall be allowed on horizontal surfaces. The maximum unit stresses shall not exceed 125 percent of the allowable stresses used by the State Department of Highways and Public Transportation for the design of structures.

Commercially produced structural units used in form work shall not exceed the

manufacturer's maximum allowable working load for moment, shear or end reaction. The maximum working load shall include a live load of 35 pounds per square foot of horizontal form surface and sufficient details and data shall be submitted for use in checking form work details for approval.

Forms shall be practically mortar-tight, rigidly braced and strong enough to prevent bulging between supports and maintained to the proper line and grade during concrete placement. Forms shall be maintained in a manner that will prevent warping and shrinkage.

Offset at form joints shall not exceed one-sixteenth of an inch.

Deflections due to cast-in-place slab concrete and railing shown in the dead load deflection diagram shall be taken into account in the setting of slab forms.

All forms and footing areas shall be cleaned of any extraneous matter before placing concrete.

Permission to place concrete will not be given until all such work is completed to the satisfaction of the Engineer.

If, at any stage of the work, the forms show signs of bulging or sagging, the portion of the concrete causing such condition shall be removed immediately, if necessary, and the forms shall be reset and securely braced against further movement.

- (2) Timber Forms. Lumber for forms shall be properly seasoned, of good quality, and free from imperfections which would affect its strength or impair the finished surface of the concrete. The lumber used for facing or sheathing shall be finished on at least one side and two edges and shall be sized to uniform thickness.

Form lining will be required for all formed surfaces, except for the inside of culvert barrels, inlets and manholes; surfaces that are subsequently covered by backfill material or are completely enclosed; and, any surface formed by a single finished board. Lining will not be required when plywood forms are used.

Form lining shall be of an approved type such as masonite or plywood. Thin membranous sheeting, such as polyethylene sheets, shall not be used for form lining.

Forms may be constructed of plywood not less than one-half inch in thickness, with no form lining required. The grain of the face plies on plywood forms shall be placed parallel to the span between the supporting studs or joists.

Plywood used for forming surfaces which remain exposed shall be equal to that specified as B-B Plyform Class I or Class II Exterior of the U. S. Department of Commerce, National Bureau of Standard, latest edition.

Forms or form lumbers to be reused shall be maintained clean and in good condition. Any lumber which is split, warped, bulged, marred or has defects that will produce inferior work shall not be used and, if condemned, shall be promptly removed from the work.

Studs and joists shall be spaced so that the facing form material remains in true alignment under the imposed loads.

Walls shall be spaced close enough to hold forms securely to the designated lines and scabbed at least 4 feet on each side of joints to provide continuity. A row of walls shall be placed near the bottom of each placement.

Facing material shall be placed with parallel and square joints and securely fastened to supporting studs.

Forms for surfaces receiving only an ordinary finish and exposed to view shall be placed with the form panels symmetrical, i.e., long dimensions set in the same direction. Horizontal joints shall be continuous.

Molding specified for chamfer strips or other uses shall be made of materials of a grade that will not split when nailed and which can be maintained to a true line without warping. Wood molding shall be mill cut and dressed on all faces. Unless otherwise provided, forms shall be filleted at all sharp corners and edges with triangular chamfer strips measuring three-fourths inch on the sides.

Forms for railing and ornamental work shall be constructed to standards equivalent to first-class millwork. All moldings, panel work and bevel strips shall be straight and true with nearly mitered joints designed so the finished work is true, sharp and clean cut.

All forms shall be constructed to permit their removal without marring or damaging the concrete. The forms may be given a slight draft to permit ease of removal.

Metal form ties of an approved type or a satisfactory substitute shall be used to hold forms in place and shall be of a type that permits ease of removal of the metal as hereinafter specified.

All metal appliances used inside of forms for alignment purposes shall be removed to a depth of at least one-half inch from the concrete surface. They shall be made so the metal may be removed without undue chipping or spalling, and when removed, shall leave a smooth opening in the concrete surface. Burning off of rods, bolts or ties will not be permitted.

Any wire ties used shall be cut back at least one-half inch from the face of the concrete.

Devices holding metal ties in place shall be capable of developing the strength of the tie and adjustable to allow for proper alignment.

Metal and wooden spreaders which are separate from the forms shall be removed entirely as the concrete is being placed.

Adequate clean-out openings shall be provided for narrow walls and other locations where access to the bottom of the forms is not readily attainable.

Prior to placing concrete, the facing of all forms shall be treated with oil or other bond breaking coating of such composition that it will not discolor or otherwise injuriously affect the concrete surface. Care shall be exercised to prevent coating of the reinforcing steel.

- (3) Metal Forms. The foregoing requirements for timber forms as regard to design, mortar-tightness, filleted corners, beveled projections, bracing, alignment, removal, reuse and wetting shall also apply to metal forms, except that these will not require lining, unless specifically noted on the plans.

The thickness of form metal shall be as required to maintain the true shape without warping or bulging. All bolt and rivet heads on the facing sides shall be countersunk. Clamps, pins or other connecting devices shall be designed to hold the forms rigidly together and to allow removal without injury to the concrete. Metal forms which do not present a smooth surface or line up properly shall not be used. Metal shall be kept free from rust, grease or other foreign materials.



6. PLACING REINFORCEMENT

Reinforcement in concrete structures shall be placed carefully and accurately and rigidly supported as provided in the specification, Section 032020 "Reinforcing Steel". Reinforcing steel supports shall not be welded to I-beams or girders.

7. PLACING CONCRETE-GENERAL

The minimum temperature of all concrete at the time of placement shall be not less than 50° F.

The consistency of the concrete as placed should allow the completion of all finishing operations without the addition of water to the surface. When conditions are such that additional moisture is needed for finishing, the required water shall be applied to the surface by fog spray only, and shall be held to a minimum amount. Fog spray for this purpose may be applied with hand operated fogging equipment.

The maximum time interval between the addition of cement to the batch, and the placing of concrete in the forms shall not exceed the following:

Air or Concrete Temperature	Maximum Time
Non-Agitated Concrete	
Up to 80° F	30 minutes
Over 80° F	15 minutes
Agitated Concrete	
90° F or above	45 minutes
75° F to 89° F	60 minutes
35° F to 74° F	90 minutes

The use of an approved retarding agent in the concrete will permit the extension of each of the above temperature-time maximums by 30 minutes for direct traffic culverts, and one hour for all other concrete except that the maximum time shall not exceed 30 minutes for non-agitated concrete.

Before starting work, the Contractor shall inform the Engineer fully of the construction methods he proposes to use, the adequacy of which shall be subject to the approval of the Engineer.

The Contractor shall give the Engineer sufficient advance notice before placing concrete in any unit of the structure to permit the inspection of forms, reinforcing steel placement, and other preparations. Concrete shall not be placed in any unit prior to the completion of form work and placement of reinforcement therein.

Concrete mixing, placing and finishing shall be done in daylight hours, unless adequate provisions are made to light the entire site of all operations.

Concrete placement will not be permitted when impending weather conditions will impair the quality of the finish work. If rainfall should occur after placing operations are started, the Contractor shall provide ample covering to protect the work. In case of drop in temperature, the provisions set forth in Article

"Placing Concrete in Cold Weather" of this specification shall be applied.

The placing shall be regulated so the pressures caused by the plastic concrete shall not exceed the loads used in form design.

The method of handling, placing and consolidation of concrete shall minimize segregation and displacement of the reinforcement, and produce a uniformly dense and compact mass. Concrete shall not have a free fall of more than 5 feet, except in the case of thin walls such as in culverts. Any hardened concrete spatter ahead of the plastic concrete shall be removed.

The method and equipment used to transport concrete to the forms shall be capable of maintaining the rate of placement approved by the Engineer. Concrete may be transported by buckets, chutes, buggies, belt conveyors, pumps or other acceptable methods.

When belt conveyors or pumps are used, sampling for testing will be done at the discharge end. Concrete transported by conveyors shall be protected from sun and wind, if necessary, to prevent loss of slump and workability. Pipes through which concrete is pumped shall be shaded and/or wrapped with wet burlap, if necessary, to prevent loss of slump and workability. Concrete shall not be transported through aluminum pipes, tubes or other aluminum equipment.

Chutes, troughs, conveyors or pipes shall be arranged and used so that the concrete ingredients will not be separated. When steep slopes are necessary, the chutes shall be equipped with baffle boards or made in short lengths that reverse the direction of movement, or the chute ends shall terminate in vertical down-spouts. Open troughs and chutes shall extend, if necessary, down inside the forms or through holes left in them. All transporting equipment shall be kept clean and free from hardened concrete coatings. Water used for cleaning shall be discharged clean of the concrete.

Each part of the forms shall be filled by depositing concrete as near its final position as possible. The coarse aggregate shall be worked back from the face and the concrete forced under and around the reinforcement bars without displacing them. Depositing large quantities at one point and running or working it along the forms will not be allowed.

Concrete shall be deposited in the forms in layers of suitable depth but not more than 36 inches in thickness, unless otherwise directed by the Engineer.

The sequence of successive layers or adjacent portions of concrete shall be such that they can be vibrated into a homogenous mass with the previously placed concrete without a cold joint. Not more than one hour shall elapse between adjacent or successive placement of concrete. Authorized construction joints shall be avoided by placing all concrete between the authorized joints in one continuous operation.

An approved retarding agent shall be used to control stress cracks and/or unauthorized cold joints in mass placements where differential settlement and/or setting time may induce stress cracking.

Opening in forms shall be provided, if needed, for the removal of laitance of foreign matter of any kind.

All forms shall be wetted thoroughly before the concrete is placed therein.

All concrete shall be well consolidated and the mortar flushed to the form surfaces by continuous working with immersion type vibrators. Vibrators which operate by attachment to forms or reinforcement will not be permitted, except on steel forms. At least one stand-by vibrator shall be provided for emergency use in addition to the ones required for placement.

The concrete shall be vibrated immediately after deposit. Prior to the beginning of work, a systematic spacing of the points of vibration shall be established to insure complete consolidation and through working of the concrete around the reinforcement, embedded fixtures, and into the corners and angles of the forms. Immersion type vibrators shall be inserted vertically, at point 18 to 30 inches apart, and slowly withdrawn. The vibrator may be inserted in a sloping or horizontal position in shallow slabs. The entire depth of each lift shall be vibrated, allowing the vibrator to penetrate several inches into the preceding lift. Concrete along construction joints shall be thoroughly consolidated by operating the vibrator along and close to but not against the joint surface. The vibration shall continue until thorough consolidation, and complete embedment of reinforcement and fixtures is produced, but not long enough to cause segregation. Vibration may be supplemented by hand spading or rodding, if necessary, to insure the flushing or mortar to the surface of all forms.

Slab concrete shall be mixed in a plant located off the structure. Carting or wheeling concrete batches over completed slabs will not be permitted until they have aged at least four full curing days. If carts are used, timber planking will be required for the remainder of the curing period. Carts shall be equipped with pneumatic tires. Curing operations shall not be interrupted for the purpose of wheeling concrete over finished slabs.

After concrete has taken its initial set, at least one curing day shall elapse before placing strain on projecting reinforcement to prevent damage to the concrete.

The storing of reinforcing or structural steel on completed roadway slabs generally shall be avoided and, when permitted, shall be limited to quantities and distribution that will not induce excessive stresses.

#### 8. PLACING CONCRETE IN COLD WEATHER

- (1) Cast-in-Place Concrete. Concrete may be placed when the atmospheric temperature is not less than 35° F. Concrete shall not be placed in contact with any material coated with frost or having a temperature less than 32° F.

Aggregates shall be free from ice, frost and frozen lumps. When required, in order to produce the minimum specified concrete temperature, the aggregate and/or the water shall be heated uniformly, in accordance with the following:

The water temperature shall not exceed 180° F, and/or the aggregate temperature shall not exceed 150° F. The heating apparatus shall heat the mass of aggregate uniformly. The temperature of the mixture of aggregates and water shall be between 50° F and 85° F before introduction of the cement.

All concrete shall be effectively protected as follows:

- (a) The temperature of slab concrete of all unformed surfaces shall be maintained at 50° F or above for a period of 72 hours from time of placement and above 40° F for an additional 72 hours.
- (b) The temperature at the surface of all concrete in piers, culverts walls, retaining walls, parapets, wingwalls, bottoms of slabs, and other similar formed concrete shall be maintained at 40° F or above for a period of 72 hours from time of placement.

- (c) The temperature of all concrete, including the bottom slabs of culverts placed on or in the ground, shall be maintained above 32° F for a period of 72 hours from time of placement.

Protection shall consist of providing additional covering, insulated forms or other means, and if necessary, supplementing such covering with artificial heating. Curing as specified under Article "Curing Concrete" of this specification shall be provided during this period until all requirements for curing have been satisfied.

When impending weather conditions indicate the possibility of the need for such temperature protection, all necessary heating and covering material shall be on hand ready for use before permission is granted to begin placement.

Sufficient extra test specimen will be made and cured with the placement to ascertain the condition of the concrete as placed prior to form removal and acceptance.

- (2) Precast Concrete. A fabricating plant for precast products which has adequate protection from cold weather in the form of permanent or portable framework and covering, which protects the concrete when placed in the forms, and is equipped with approved steam curing facilities, may place concrete under any low temperature conditions provided:
  - (a) The framework and covering are placed and heat is provided for the concrete and the forms within one hour after the concrete is placed. This shall not be construed to be one hour after the last concrete is placed, but that no concrete shall remain unprotected longer than one hour.
  - (b) Steam heat shall keep the air surrounding the concrete between 50° F and 85° F for a minimum of three hours prior to beginning the temperature rise which is required for steam curing.
  - (c) For fabricating plants without the above facilities and for job site precast products, the requirements of the Article "Curing Concrete" of this specification will apply.

The Contractor is responsible for the protection of concrete placed under any and all weather conditions. Permission given by the Engineer for placing during freezing weather will in no way relieve the Contractor of the responsibility for producing concrete equal in quality to that placed under normal conditions. Should concrete placed under such conditions prove unsatisfactory, it shall be removed and replaced at no additional cost.

#### 9. PLACING CONCRETE IN WATER

Concrete shall be deposited in water only when specified on the plans or with written permission by the Engineer. The forms or cofferdams shall be sufficiently tight to prevent any water current passing through the space in which the concrete is being deposited. Pumping will not be permitted during the concrete placing, nor until it has set for at least 36 hours.

The concrete shall be placed with a tremie, closed bottom-dump bucket, or other approved method, and shall not be permitted to fall freely through the water nor shall it be disturbed after it has been placed. Its surface shall be kept approximately level during placement.

The tremie shall consist of a water-tight tube 14 inches or less in diameter. It shall be constructed so that the bottom can be sealed and opened after it is in

place and fully charged with concrete. It shall be supported so that it can be easily moved horizontally to cover all the work area and vertically to control the concrete flow.

Bottom-dump buckets used for underwater placing shall have a capacity of not less than one-half cubic yard. It shall be lowered gradually and carefully until it rests upon the concrete already placed and raised very slowly during the upward travel; the intent being to maintain still water at the point of discharge and to avoid agitating the mixture.

The placing operations shall be continuous until the work is complete.

#### 10. PLACING CONCRETE IN BOX CULVERTS

In general, construction joints will be permitted only where shown on the plans.

Where the top slab and walls are placed monolithically in culverts more than 4 feet in clear height, an interval of not less than one nor more than 2 hours shall elapse before placing the top slab to allow for shrinkage in the wall concrete.

The base slab shall be finished accurately at the proper time to provide a smooth uniform surface. Top slabs which carry direct traffic shall be finished as specified for roadway slabs in Article "Finish of Roadway Slabs". Top slabs of fill type culverts shall be given a reasonable smooth float finish.

#### 11. PLACING CONCRETE IN FOUNDATIONS AND SUBSTRUCTURE

Concrete shall not be placed in footings until the depth and character of the foundation has been inspected by the Engineer and permission has been given to proceed.

Placing of concrete footings upon seal courses will be permitted after the caissons or cofferdams are free from water and the seal course cleaned. Any necessary pumping or bailing during the concreting operation shall be done from a suitable sump located outside the forms.

All temporary wales or braces inside cofferdams or caissons shall be constructed or adjusted as the work proceeds to prevent unauthorized construction joints in footings or shafts.

When footings can be placed in a dry excavation without the use of cofferdams or caissons, forms may be omitted, if desired by the Contractor and approved by the Engineer, and the entire excavation filled with concrete to the elevation of the top of footing in which case measurement for payment will be based on the footing dimensions shown on the plans.

#### 12. TREATMENT AND FINISHING OF HORIZONTAL SURFACES EXCEPT ROADWAY SLABS

All uniformed upper surfaces shall be struck off to grade and finished. The use of mortar topping for surfaces under this classification will not be permitted.

After the concrete has been struck off, the surface shall be floated with a suitable float. Sidewalks shall be given a wood float or broom finish or; may be stripped with a brush, as specified by the Engineer. Other surfaces shall be wood float finished and stripped with a fine brush leaving a fine grained texture.

#### 13. FINISH OF ROADWAY SLABS

As soon as the concrete has been placed and vibrated in a section of sufficient width to permit working, the surface shall be approximately leveled, struck off

038000

Rev 11/23/99

Page 11 of 16

and screeded, carrying a slight excess of concrete ahead of the screed to insure filling of all low spots. The screed shall be designed rigid enough to hold true to shape and shall have sufficient adjustments to provide for the required camber. A vibrating screed may be used if heavy enough to prevent undue distortion. The screeds shall be provided with a metal edge.

Longitudinal screeds shall be moved across the concrete with a saw-like motion while their ends rest on headers or templates set true to the roadway grade or on the adjacent finished slab.

The surface of the concrete shall be screeded a sufficient number of times, and at such intervals to produce a uniform surface, true to grade and free of voids.

If necessary, the screeded surface shall be worked to smooth finish with a long handled wood or metal float of the proper size, or hand floated from bridges over the slab.

When required by the Engineer, the Contractor shall perform sufficient checks with a long handled 10 foot straightedge on the plastic concrete to insure that the final surface will be within the tolerances specified below. The check shall be made with the straightedge parallel to the centerline. Each pass thereof shall lap half of the preceding pass. All high spots shall be removed and all depressions over one-sixteenth inch in depth shall be filled with fresh concrete and floated. The checking and floating shall be continued until the surface is true to grade and free of depressions, high spots, voids or rough spots.

Rail support holes shall be filled with concrete and finished to match the top of the slab.

A broom finish shall be applied with longitudinal screeding. A broom or burlap drag finish shall be applied with transverse screeding.

Unless otherwise specified, the burlap drag shall consist of four or more layers of 10-ounce burlap fabric, free of seams, dirt or hardened concrete. It shall be kept wet when in use and it shall be drawn over the surface in as many passes as required to produce the desired texture depth. Broom finishes shall be applied with stiff bristled brooms. The Contractor shall have on hand at all times brooms for the purpose of providing the desired texture depth when surface conditions are such that the burlap drag will not provide it.

Upon completion of the floating and/or straight edging and before the disappearance of the moisture sheen, the surface shall be given a broom or burlap drag finish. The grooves of these finishes shall be parallel to the structure centerline. It is the intent that the average texture depth resulting from the number of tests directed by the Engineer be not less than 0.035-inches with a minimum texture depth of 0.030-inches for any one test when tested in accordance with Test Method Tex-436-A. Should the texture depth fall below that intended, the finishing procedures shall be revised to produce the desired texture.

After the concrete has attained its final set, the roadway surface shall be tested with a standard 10 foot straight-edge. The straight-edge shall be placed parallel to the centerline of roadway to bridge any depressions and touch high spots. Ordinates of irregularities measured from the face of the straight-edge to the surface of the slab shall not exceed one-eighth of an inch, making proper allowances for camber, vertical curvature and surface texture. Occasional variations, not exceeding three-sixteenth of an inch will be acceptable, if in the opinion of the Engineer it will not effect the riding qualities.

When directed by the Engineer, irregularities exceeding the above requirements shall be corrected.

In all roadway slab finishing operations, camber for specified vertical curvature

038000

Rev 11/23/99

Page 12 of 16

and transverse slopes shall be provided.

#### 14. CURING CONCRETE

The Contractor shall inform the Engineer fully of the methods and procedures proposed for curing; shall provide the proper equipment and material in adequate amounts, and shall have the proposed method, equipment and material approved prior to placing concrete.

Inadequate curing and/or facilities therefore shall be cause for the Engineer to stop all construction on the job until remedial action is taken.

All concrete shall be cured for a period of 4 curing days except as noted herein.

#### EXCEPTIONS TO 4-DAY CURING

<u>Description</u>	<u>Required Curing</u>
Top slabs of Direct Traffic	8 curing days (Type I or III) cement
Culverts	10 curing days (Type II cement)
Concrete Piling (non-prestressed)	6 curing days

When the air temperature is expected to drop below 35° F, the water curing mats shall be covered with polyethylene sheeting, burlap-polyethylene blankets or other material to provide the protection required by Article "Placing Concrete in Cold Weather" of these specifications.

A curing day is defined as a calendar day when the temperature, taken in the shade away from artificial heat, is above 50° F for at least 19 hours, (colder days if satisfactory provisions are made to maintain the temperature at all surfaces of the concrete above 40° F for the entire 24 hours). The required curing period shall begin when all concrete therein has attained its initial set.

The following methods are permitted for curing concrete subject to the restrictions of Table 1 and the following requirements for each method of curing.

- (1) Form Curing. When forms are left in contact with the concrete, other curing methods will not be required except for cold weather protection.
- (2) Water Curing. All exposed surfaces of the concrete shall be kept wet continuously for the required curing time. The water used for curing shall meet the requirements for concrete mixing water as specified in the specification, Section 030030 "Concrete for Structures". Sea water will not be permitted. Water which stains or leaves an unsightly residue shall not be used.
  - (a) Wet Mat. Cotton mats shall be used for this curing method. They shall be placed as soon as possible after the surface has sufficiently hardened to prevent damage to the concrete. (See Article, "Placing Concrete" of this specification.) Damp burlap blankets made from nine ounce stock may be placed on the damp concrete surface for temporary protection prior to the application of the cotton mats which may be placed dry and wetted down after placement.

The mats shall be weighted down adequately to provide continuous contact with all concrete surfaces where possible. The surfaces of the concrete shall be kept wet for the

required curing time. Surfaces which cannot be cured by contact shall be enclosed with mats, anchored positively to the forms, or to the ground, so that outside air cannot enter the enclosure. Sufficient moisture shall be provided inside the enclosure to keep all surfaces of the concrete wet.

- (b) Water Spray. This method shall consist of overlapping sprays or sprinklers, that keeps all unformed surfaces continuously wet.
  - (c) Ponding. This method requires the covering of the surfaces with a minimum of two inches of clean granular material, kept wet at all times, or a minimum of one-inch depth of water. Satisfactory provisions shall be made to provide a dam to retain the water or saturated sand.
- (3) Membrane Curing. This consists of curing concrete pavement, concrete pavement (base), curbs, gutters, retards, sidewalk, driveways, medians, islands, concrete riprap, cement stabilized riprap, concrete structures and other concrete as indicated on the plans by impervious membrane method.

Unless otherwise provided herein or shown on the plans, either Type 1 or Type 2 membrane curing compound may be used where permitted except that Type 1 (Resin Base Only) will be permitted for slab concrete in bridge decks and top of direct traffic culverts.

TABLE 1

	STRUCTURE UNIT DESCRIPTION	REQUIRED		PERMITTED	
		WATER FOR CURING	MEMBRANE FOR INTERIM CURING	WATER FOR CURING	MEMBRANE FOR INTERIM CURING
1	Top slabs of direct traffic culverts	X	X		
2	Top surface of any concrete unit upon which concrete is to be placed and bonded at a later interval (Stub walls, risers, etc.) Other superstructure concrete (wing walls, parapete walls, etc.)	X			
3	Concrete pavement (base), curbs, gutters, retards, sidewalks, driveways, medians, islands, concrete structures, concrete riprap, etc.			X*	X*
4	All substructure concrete, culverts, box sewers, inlets, manholes, retaining walls			X*	X*



\*Polyethylene sheeting, burlap polyethylene mats or laminated mats to prevent outside air from entering will be considered equivalent to water or membrane curing for items 3 and 4.

Membrane curing shall be applied to dry surfaces, but shall be applied just after free moisture has disappeared. Formed surfaces and surfaces which have been given a first rub shall be dampened and shall be moist at the time of application of the membrane.

When membrane is used for complete curing, the film shall remain unbroken for the minimum curing period specified. Membrane which is damaged shall be corrected immediately by reapplication of membrane. Unless otherwise noted herein or on the plans, the choice of membrane type shall be at the option of the Contractor. Only one type of curing compound will be permitted on any one structure.

The membrane curing compound shall be applied after the surface finishing has been completed, and immediately after the free surface moisture has disappeared.

The surface shall be sealed with a single uniform coating of curing compound applied at the rate of coverage recommended by the manufacturer and directed by the Engineer, but not less than 1 gallon per 180 square feet of area. The Contractor shall provide satisfactory means and facilities to properly control and check the rate of applications of the compound.

The compound shall be thoroughly agitated during its use and shall be applied by means of approved mechanical power pressure sprayers. The sprayers used to apply the membrane to concrete pavement or concrete pavement (base) shall travel at uniform speed along the forms and be mechanically driven. The equipment shall be of such design that it will insure uniform and even application of the membrane material. The sprayers shall be equipped with satisfactory atomizing nozzles. Only on small miscellaneous items will the Contractor be permitted to use hand-powered spray equipment. For all spraying equipment, the Contractor shall provide facilities to prevent the loss of the compound between the nozzle and the concrete surface during the spraying operations.

The compounds shall not be applied to a dry surface and if the surface of the concrete has become dry, it shall be thoroughly moistened prior to application of membrane by fogging or mist application. Sprinkling or coarse spraying will not be allowed.

At locations where the coating shows discontinuities, pinholes, or other defects; or if rain falls on the newly-coated surface before the film has dried sufficiently to resist damage, an additional coat of the compound shall be applied immediately at the same rate of coverage specified herein.

To insure proper coverage, the Engineer shall inspect all treated areas after application of the compound for the period of time designated in the governing specification for curing, either for membrane curing or for other methods. Should the foregoing indicate that any area during the curing period is not protected, an additional coat or coats of the compound shall be applied immediately, and the rate of application of the membrane compound shall be increased until all areas are uniformly covered.

When temperatures are such as to warrant protection against freezing, curing by this method shall be supplemented with an approved insulating material capable of protecting the concrete for the specified curing period.

If at any time there is reason to believe that this method of curing is unsatisfactory or is detrimental to the work, the Contractor, when notified, shall immediately cease the use of this method and shall change to curing by one of the other methods specified under this contract.

#### 15. REMOVAL OF FORMS

Except as herein provided, forms for vertical surfaces may be removed when the concrete has aged not less than one day when Type I and Type II cement is used, and not less than one-half day when Type III cement is used, provided it can be done without damage to the concrete.

Forms for inside curb faces may be removed in approximately three hours provided it can be done without damage to the curb.

#### 16. FINISHING EXPOSED SURFACES

Concrete shall be finished as required in the Standard Specifications for the respective items or as otherwise specified on the plans.

An ordinary surface finish shall be applied to all concrete surfaces either as a final finish or preparatory to a higher finish.

Ordinary Surface Finish shall be as follows:

After form removal, all porous or honey-combed areas and spalled areas shall be corrected by chipping away all loose or broken material to sound concrete.

Feather edges shall be eliminated by cutting a face perpendicular to the surface. Shallow cavities shall be repaired using adhesive grout or epoxy grout. If judged repairable by the Engineer, large defective areas shall be corrected using concrete or other material approved by the Engineer.

Holes and spalls caused by removal of metal ties, etc., shall be cleaned and filled with adhesive grout or epoxy grout. Exposed parts of metal chairs on surfaces to be finished by rubbing, shall be chipped out to a depth of one-half inch and the surface repaired.

All fins, runs, drips or mortar shall be removed from surfaces which remain exposed. Form marks and chamfer edges shall be smoothed by grinding and/or dry rubbing.

Grease, oil, dirt, curing compound, etc., shall be removed from surfaces requiring a higher grade of finish. Discolorations resulting from spillage or splashing of asphalt, paint or other similar material shall be removed.

Repairs shall be dense, well bonded and properly cured, and when made on surfaces which remain exposed and do not require a higher finish, shall be finished to blend with the surrounding concrete.

#### 17. MEASUREMENT AND PAYMENT

No direct measurement or payment will be made for the work to be done or the equipment to be furnished under this specification, but it shall be considered subsidiary to the particular items required by the plans and the contract.

SECTION 041020  
STRUCTURAL CLAY TILE FLOOR AND SIDEWALK (S-22)

1. DESCRIPTION

This specifications shall govern all work and materials necessary for placement of clay tile required to complete the project.

2. MATERIALS

Clay Tile shall meet the requirements of Grade FT2 of ASTM C-57.

Mortar shall be in accordance with ASTM C-270 and shall be Grade M, unless indicated otherwise in the drawings.

3. CONSTRUCTION METHODS

Tile shall be set in a full bed of mortar not exceeding  $\frac{1}{2}$  inch in thickness. Tile shall be placed in a workmanlike manner. The exposed face of the tile shall be cleaned upon completion. In extreme cases, a 5% solution of muratic acid may be used for cleaning tile. If acid is used, it shall be preceded and followed by a generous bath of fresh clean water.

4. MEASUREMENT & PAYMENT

Unless indicated otherwise in the Proposal, Structral Clay Tile Floor and Sidewalk shall not be measured and shall be considered subsidiary to other work.

SECTION 041080  
BRICK PAVERS (S-50)

1. Scope:

The work under this section consists of furnishings of materials, labor, transportation, tools and service required for the execution of all brick paving on a concrete setting bed and installing other brick units as shown on the drawings and as specified herein.

2. Related Work Included Under Other Sections:

Concrete setting base - 4" concrete sidewalk conforming to Section 025612.

3. Materials:

1. Brick Pavers - Nominal 4x8x1 as manufactured by Endicott Clay Products Company, Medium/Iron Spec, or approved equal, to match existing pavers at existing walks and plaza at site. Units shall be submitted to the Engineer for approval.
2. Joint Filler - for expansion joints shall be as specified in the specifications.
3. Caulking - for expansion joints shall be as specified in the specifications.
4. Concrete Setting Bed - shall be conventional mortar leveling bed with Laticrete 3701 admixture installed over concrete walks.
5. Adhesive Material - Paving brick shall be set with Laticrete 4237 thin set mortar suitable for exterior use. See plans for location of pavers.

4. Sample:

Construct a sample area of each type of brick pavement not less than 200 square feet in size. Sample will be constructed as part of the project and if approved, will be accepted as part of the final paving. However, should the sample fail to meet the Engineer's approval, it shall be removed and reconstructed until approved.

5. Installation of Paving Brick:

1. Brick shall be installed in accordance with the scale and dimensions on the drawings. Brick shall be laid in running bond with tight joints.
2. Setting beds shall be smoothed and leveled. Pavers will then be laid in a trowled adhesive bed.
3. No chipped or cracked brick units shall be incorporated into the work. Where brick units must be cut, they shall be saw cut to provide sharp, clean edges. Angled cuts and gaps at the edges of the pavement will not be acceptable.
4. Cleaning of the brick paving surface shall be done within 24 hours after removal of surface mortar by scrubbing the surface with one or more muriatic acid solutions using a long handled brush with stiff fiber bristles, continuing until the brick paving is clean, free of mortar and showing its true color. After the surface has been cleaned thoroughly with the acid solution, it shall be flushed with clear water to prevent

further action of the acid. Muriatic acid solution shall be one part acid, fifteen (15) parts water.

5. Expansion joint filler shall be installed where indicated and where brick paving abutts walls, concrete paving, or other restraining items. Expansion joint material shall never be carried through the brick paving.

6. Measurement & Payment

Unless indicated otherwise in the Proposal, Brick Pavers will be measured by the square foot of surface of completed brick paver sidewalk as indicated in the plans.

Payment shall be full compensation for preparing the subgrade; for furnishing and placing all materials, including all reinforced steel and expansion joint materials; and all manipulation, labor, tools, equipment and incidentals necessary to complete the work.

SECTION 042020  
CONCRETE MASONRY UNIT (S-121)

1. GENERAL

Scope: Furnish all labor, materials, transportation, services, tools and equipment to properly execute work for Concrete Masonry Unit.

2. MATERIALS

Concrete masonry units shall conform to ASTM C90 and C129 and shall include hollows, solids, closers, jamb units, headers and special shapes and sizes required. Linear shrinkage as determined by ASTM C426 shall not exceed .03%.

Mortar shall be Type S consisting of 1 part Portland cement, 1 part Type S hydrated lime and 6 parts sand. Portland cement shall be Type I, II, or III as per ASTM C150. Hydrated lime shall be Type S as per ASTM C207. Sand shall be as per ASTM C144. Water shall be drinkable. Mortar shall be natural.

Joint reinforcement shall be made from cold drawn steel wire as per ASTM A82, and shall consist of two deformed side rods welded at 16" intervals to a continuous diagonal cross rod forming a truss design and shall be galvanized after fabrication.

Provide bolts and rods fabricated from not less than 16 ga. sheet metal or 3/8" diameter rod stock, unless otherwise indicated.

3. EXECUTION

Mixing Mortar: All materials shall be mixed a minimum of 5 minutes in a mechanical batch mixer. All mortar shall be used within 2 1/2 hours of initial mixing.

Erection: Bond pattern shall be running bond. Joints shall be 3/8". Mortar joints which are exposed and have become "thumbprint" hard shall be tooled with a round jointer. Masonry units shall be laid plumb and true to lines.

Joint reinforcement in all concrete masonry unit walls shall be in every other horizontal course and shall be continuous. Side rods shall be lap 6" at splices.

Cleaning:

- a. Holes in exposed masonry shall be pointed and defective joints cut out and repaired.
- b. Exposed masonry shall be protected against staining by wall coverings, and excess mortar shall be wiped off as work progresses. All exposed masonry shall be thoroughly cleaned.

SECTION 050200  
WELDING (S-43)

1. DESCRIPTION

This specification shall govern for the field welding of structural steel and reinforcing steel.

Provisions are made herein for the welding of the types of steel listed in Table 1, using the manual shielded metal-arc process, semi-automatic (manual) gas metal-arc welding and flux cored arc welding processes. Other welding processes may be permitted with the specific approval of the Engineer and with qualification of the welding procedure.

2. STRUCTURAL STEEL GENERAL

Final welds including tack welds to be incorporated therein shall be by a certified welder. Certification being previously certified by tests as prescribed in the "Code for Welding in Building Construction," ASW D1.0-69, of the American Welding Society to perform the type of work required. Miscellaneous welds may be made by a qualified welder, qualified welder being an experienced welder who is capable of making good welds of sound quality, but does not have certification papers. Miscellaneous welds being, welds that have no load carrying capacity in the completed structure. Tack welds shall be cleaned and fused thoroughly with the final weld. Defective, cracked or broken tack welds shall be removed.

Welds shall be as required by the contract or erection drawings. The location or size shall not be changed without approval of the Engineer.

The welder shall place his identification mark with crayon or paint near the groove welds made by him.

No welding will be allowed when the air temperature is lower than 20° F, when surfaces are wet or exposed to rain, snow, or wind, or when operators are exposed to inclement conditions that will hamper good workmanship.

Any moisture present at the point of welding shall be driven off by heat before welding commences. Windbreaks shall be required for the protection of all welding operations.

There shall be no temporary welds for transportation, erection or other purpose on main members, except at locations more than one-sixth the depth of the web from the flanges of beams and girders, as approved by the Engineer.

On A514 steel, all groove welds in main members and in flanges of beams and girders subject to tensile stress or reversals of stress shall be finished smooth and flush on all surfaces, including edges, by grinding in the direction of applied stress, leaving the surfaces free from depressions. Chipping may be used provided it is followed by such grinding. Parts joined by groove welds connecting plates of unequal thickness or width shall have a smooth transition between offset surfaces at a slope not greater than one in four with the surface of either part. The surfaces shall be ground so that the radii at the points of transition will be 4 inches minimum.

All groove welds, except when produced with the aid of backing, shall have the root of the initial weld gouged, chipped or otherwise removed to sound metal before welding is started from the second side, except that back gouging will not be required when welding steel piling or armor joints with E 6010 electrodes. The backside shall be thoroughly cleaned before placing back-up pass.

When backing for welds are left in place to become a part of the structure, it shall

be a single length insofar as possible. Where more than a single length is needed, they shall be jointed by full penetration butt welds. The surfaces of this butt weld shall be ground flush as necessary to obtain proper fit-up in the weld joint.

Before welding over previously deposited metal, all slag shall be removed, and the weld and adjacent base metal shall be cleaned. This requirement shall apply equally to successive layers, successive beads and the crater area.

Arc strikes outside the area of permanent welds must be avoided on all steels. Where they do occur, resulting cracks and blemishes shall be ground out to a smooth contour and checked to insure soundness.

Stringer bead technique shall be used where possible for groove welds on all types of steel. Weaving will not be permitted for A514 steel except in welding vertically upward, when a weave not exceeding two electrode diameters is permissible for manual shielded metal-arc welding.

In all welding processes, the progression for all passes in vertical welding shall be upward using a back step sequence.

Groove welds shall begin and terminate at the ends of a joint on extension bars. Edge preparation and thickness of extension bars shall be the same as that of the member being welded and shall extend a minimum of three-fourths inch beyond the joint. Extension bars shall be removed with a cutting torch upon completion and cooling of the weld, and the flange edges shall be smooth.

Any defects exposed by the grinding shall be cleaned, filled with weld metal, and reground to a uniform finish. All grinding shall be parallel to the flange. Excess grinding of the parent metal shall be avoided.

### 3. FILLER METAL

Electrodes for manual shielded metal-arc welding shall conform to the requirements of the latest edition of "Specifications for Mild Steel Covered Arc-Welding Electrodes", AWS A5.1, or to the requirements of the latest edition of "Specification for Low Alloy Steel Covered Arch-Welding Electrodes," AWS A5.5.

All electrodes and combination of electrode and shielding for gas metal-arc welding for producing weld metal with a minimum specified yield point not exceeding 60,000 psi shall conform to the requirements in the latest edition, "Specification for Mild Steel Electrodes for Gas Metal-Arc Welding," AWS A5.18, or "Specification for Mild Steel Electrodes for Flux Cored Arc Welding," AWS A5.20, applicable for the classifications producing weld metal having a minimum impact strength of 20 ft. -lb., Charpy V-notch, at a temperature of 0° F or below.

For weld metal with a minimum specified yield strength exceeding 60,000 psi, the Contractor shall demonstrate that each electrode and flux or combination of electrode and shielding medium proposed for use will produce low alloy weld metal having the mechanical properties listed in Table A.

The mechanical properties shall be determined from a multiple pass weld made in accordance with the test requirements of the latest edition of AWS A5.18 or AWS A5.20 as applicable.

TABLE A

#### Required Mechanical Properties



GMAW Grade	FCAW Grade	Tensile Strength psi - Min	Yield Strength psi - Min	Elongation, % in 2 inches Min	Impact Strength ft-lb @ OF-Min
E80S	E80T	80,000	65,000	18	20
E90S	E90T	90,000	78,000	17	20
E100S	E100T	100,000	90,000	16	20
E110S	E110T	110,000	98,000	15	20

The mechanical property tests for Grades E110S, E110S, E100T and E110T shall be made using ASTM A 514 base material.

Class of electrode required will be as shown in Table A. Electrodes shall be used with the type of current, the polarity and in the positions permitted by AWS A5.1 and A5.5 for manual shielded metal-arc welding. AWS A5.18 and A5.20 Specifications shall govern for gas metal-arc welding and flux cored arc welding.

TABLE 1  
CLASSIFICATION OF ELECTRODES PERMITTED

Type of Steel	Main Members Groove & Fillet Welds		Secondary Members Groove & Fillet Welds	
Steel Piling	E6010	E60T-8	E60XX	E70S-6
	E6011	E70D-1B	E70XX	E70U-1
A53 Pipe, A500	E7015	E70S-2	E70S-1B	E60T-8
A501	E7016	E70S-3	E70S-2	
	E7018	E70S-6	E70S-3	
Armor Joints		E-70U-1		
A36	E7015	E703-1B	E7015	E70S-1B
A441	E7016	E70S-2	E7016	E70S-2
A572-Grades 42 thru 50	E7018	E70S-3	E7018	E70S-3
	E70U-1	E70S-6	E70T-1	E70S-6
A588	E70T-5	E70S-6	E70T-5	E70U-1
A242(Deck Plates)			E70T-6	
API				
A514	E11018M		E11018M	
	E110S	E110T	E110S	E110T
Reinforcing Steel	E7015	E7016	E7018	

A572 Grades  
60 and 65  
for Light  
Towers

E8015

E8016

E8018 Grades E80S or  
E80T

1. Use of the same type electrode with the next higher mechanical properties, in accordance with AWS A5.1 or A5.5, than those listed will be permitted.
2. In joint involving base metals of difference yield points or strengths, low hydrogen electrodes applicable to the lower strength base metal may be used.

Before use, all electrodes with low hydrogen coverings conforming to AWS A5.1 shall be dried for not less than two hours between 450° and 500° F and electrodes with low hydrogen coverings conforming to AWS A5.5 for not less than one hour at a temperature between 700° and 800° F. Immediately after drying, electrodes shall be stored in ovens held at a temperature of at least 250° F. E70 electrodes not used within four hours, E80 within two hours and E110 within one-half hour after removal from the storage oven shall be redried before use. Electrodes which have been wet or with cracked or otherwise damaged flux shall not be used. When used for welding A514 steel, electrodes shall be dried at least one hour at temperatures between 700° and 800° F before being used. Electrodes shall be redried only once.

Suitable facilities for drying and storage of electrodes shall be furnished at the job site, along with thermometers for checking and controlling the oven temperature.

In humid atmospheres, the times allowed for use without redrying may be reduced.

When gas or gas mixture is used for gas metal-arc or flux cored arc welding, it shall be of a welding grade having a dew point of -40° F or lower. The gas manufacturer shall furnish certification to the Engineer that the gas or gas mixture is suitable for the intended application and will meet the dew point requirements.

Welding wire coils removed from the original package shall be protected or stored to keep their characteristics or welding properties intact. Rusty coils, or portions of coils that are rusty shall not be used.

### 3. Preheat

Preheat ahead of welding both groove and fillet welds (including tack welding) will be required as shown in Table 2. Any moisture present at the point of welding shall be driven off by preheating before welding begins. When the base metal is below the required temperature, it shall be preheated so the parts being welded are not less than the specified temperature within 3 inches of the point of welding.

Preheat and interpass temperatures must be sufficient to prevent crack formation. The preheat temperatures shown are minimum and higher preheats may be necessary in highly restrained welds.

Preheating equipment shall be adequate to maintain the entire joint at or above the specified temperature. When possible, a joint shall be completely welded before it is allowed to cool below the specified temperature but shall always be welded sufficiently to prevent cracking before cooling is permitted.

Usually preheat and interpass temperatures shall not exceed 400° F for thickness up to 1 1/2 inches and 450° F for greater thickness. These temperatures shall never be exceeded on A514 steel.

The welder shall have and use approved equipment for checking preheat and interpass temperatures at all times while welding is in progress.

For all groove welds, preheat temperature shall be measured on the side opposite to which the heat is applied at points about three inches away from the joint.

TABLE 2

MINIMUM PREHEAT AND INTERPASS TEMPERATURE FOR  
MANUAL SHIELDED METAL-ARC WELDING, FLUX  
CORED ARC WELDING OR GAS METAL-ARC WELDING

MANUAL OR SEMI-AUTOMATIC  
GAS METAL-ARC WELDING, FLUX CORED ARC WELDING OR  
MANUAL SHIELDED METAL-ARCH WELDING

With Low Hydrogen Electrodes

Thickness of Thickness Part at Point of Welding	MANUAL OR SEMI-AUTOMATIC GAS METAL-ARC WELDING, FLUX CORED ARC WELDING OR MANUAL SHIELDED METAL-ARCH WELDING <u>With Low Hydrogen Electrodes</u>	
	ASTM A 36: A 242; A 441 A 572 Grades 42, 45, and 50; A 588	ASTM A 514
To 3/4, incl.	50F	50F
Over 3/4 to 1 $\square$ , incl.	70F	125F
Over 1 $\square$ to 2 $\square$ , incl.	150F	175F
Over 2 $\square$	225F	225F

1. These temperatures are the minimum required for the thinner material shown for each increment and higher preheat on a step basis will be required for the thicker material within each increment. Preheat and interpass temperatures must be sufficient to prevent crack formation. Temperature above those shown may be required for highly restrained welds.
2. When E7010 electrodes are permitted for tacking or temporary root pass, the material shall be preheated to 400° F.
3. When joining steels of different strengths or thickness with groove welds, the preheat and interpass temperature for the higher strength steel and the average plat thickness shall be used. For fillet welds, the preheat shall be used for the higher strength steel and the thickest plate being welded.
4. When the base metal temperature is below 32° F preheat to at least 70° F and maintain this minimum temperature during welding.
5. Heat input when welding A514 steel shall not exceed the steel producers' recommendations.

4. QUALITY OF WELDS

Weld metal shall be sound throughout.

There shall be no cracks in any weld or weld pass.

There shall be complete fusion between the weld metal and the base metal and between successive passes throughout the joint.

Welds shall be free from overlap and the base metal free from undercut more than one one-hundredth inch deep when its direction is transverse to the primary stress in the

part that is undercut. Undercut shall not be more than one thirty-second inch deep when its direction is parallel to the primary stress in the part that is undercut.

All craters shall be filled to the full cross section of the welds.

All welds on A514 steel shall be visually examined for longitudinal or transverse cracks not less than 48 hours after completion of the welding.

## 5. CORRECTIONS

When welding is unsatisfactory or indicates inferior workmanship, the following corrective measures will be required by the Engineer whose specific approval shall be obtained for making each correction.

When requirements prescribe the removal of part of the weld or a portion of the base metal, removal shall be by oxygen gouging or arc-air gouging.

Oxygen gouging shall not be used on A514 steel. All surfaces shall be ground after arc-air gouging.

Backgouging of splices in beams and girders or cutouts of defective welds shall be done by a welder qualified to make beam and girder splices.

Where corrections require the deposition of additional weld metal, the sides of the area to be welded shall have sufficient slope to permit depositing new metal.

Defective or unsound welds shall be corrected either by removing and replacing the entire weld, or as follows:

Excessive convexity. Reduce to size by grinding off the excess weld metal.

Shrinkage cracks, cracks in base metal, craters and excessive porosity. Remove defective portions of base and weld metal down to sound metal and replace with additional sound weld metal.

Undercutting, undersize, and excessive concavity. Clean and deposit additional weld metal.

Overlapping and incomplete fusion. Remove and replace the defective portion of weld.

Slag inclusions. Remove the parts of the weld containing slag and replace with sound weld metal.

Removal of an adjacent base metal during welding. Clean and form full size by depositing additional weld metal.

Where corrections require the deposition of additional weld metal, the electrode used shall be smaller than that used for making the original weld. Surfaces shall be cleaned thoroughly before rewelding.

A cracked weld shall be removed throughout its length, unless the extent of the crack can be ascertained to be limited, in which case the weld metal shall be removed 2 inches beyond each end of the crack and repairs made.

Where work performed after the making of a deficient weld has made the weld inaccessible or has caused new conditions making the correction of the deficiency dangerous or ineffectual, the original conditions shall be restored by removal of welds or members, or both, before making the necessary corrections, or else the deficiency shall be compensated by additional work

according to a revised design approved by the Engineer.

Improperly fitted and misaligned parts shall be cut apart and rewelded.

Members distorted by the heat of welding shall be straightened by mechanical means or by the carefully supervised application of a limited amount of localized heat. Heated areas shall not exceed 1200° F as measured by Tempilsticks or other approved methods for steel up to 65,000 psi yield strength. Parts to be heat straightened shall be substantially free of stress from external forces, except when mechanical means are used in conjunction with the application of heat.

Heat straightening of A514 steel shall be done only under rigidly controlled procedures, subject to the approval of the Engineer. In no case shall the maximum temperature of the steel exceed 1100° F. Sharp kinks and bends shall be cause for rejection of the material.

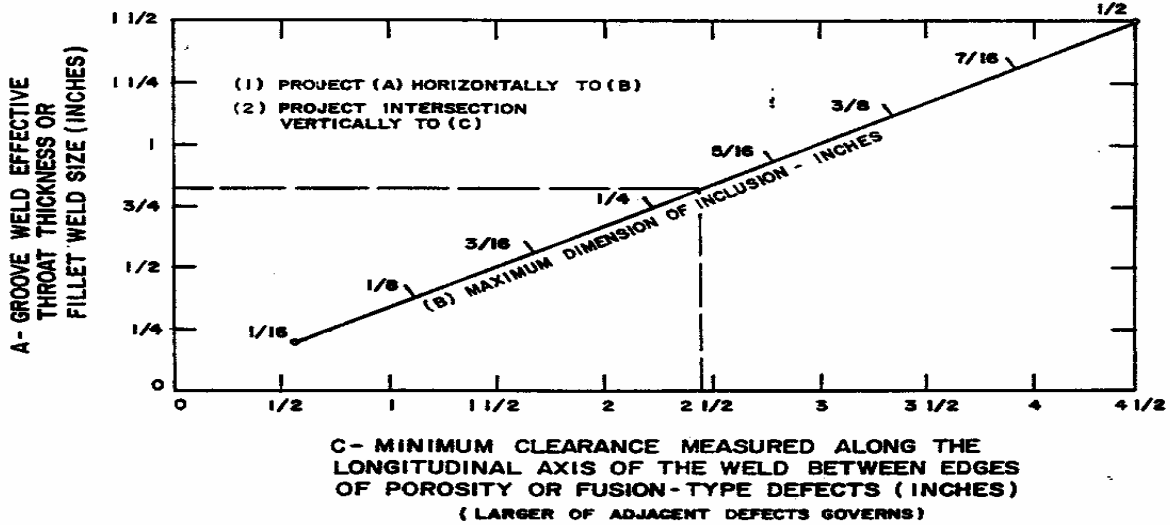
#### 6. RADIOGRAPHIC INSPECTION

All groove welds designed to carry primary stresses shall be subject to radiographic inspection. When subjected to such inspections, the presence of any of the following defects in excess of the limits indicated will result in rejection of the defective weld until corrected.

1. Sections of welds shown to have any cracking, regardless of length or locations, incomplete fusion, overlapping, or inadequate penetration shall be judged unacceptable.
2. Inclusions less than one-sixteenth inch in greatest dimension including slag, porosity and other deleterious material, shall be permitted if well dispersed so that the sum of the greatest dimensions of the inclusions in any linear inch of welded joint shall not exceed three-eighths inch.
3. Inclusions one-sixteenth inch or larger in greatest dimension shall be permitted provided such defects do not exceed the limits shown on Figure 1 or in paragraph (2) above.
4. There shall be no inclusion greater than one-sixteenth inch within one inch of the edge of part or member at the join or point of restraint.

#### FIGURE 1 STANDARDS FOR ALLOWABLE INCLUSIONS

## STANDARDS FOR ALLOWABLE INCLUSIONS



**NOTES:**

1. The distance from the edge of an inclusion to the edge of a plate or to any intersecting weld shall be equal to or greater than the clearance between inclusion.
2. Inclusions with any dimension greater than 1/2 inch are not acceptable.
3. For joint thickness greater than 1-1/2 inches, the minimum allowable dimension and spacing of inclusions shall be the same as for 1-1/2 inch joints.
4. Values of (B) obtained by projecting horizontally from (A) are maximum value. Any value of (B) smaller than the maximum is satisfactory.
5. Values of (C) obtained by projecting vertically from (B) are minimum values. Any value of (C) larger than the minimum is satisfactory.

Radiographic inspection shall be made of A514 steel not less than 48 hours following the completion of the welding. For other steels, nondestructive inspection may begin immediately after welding and cleaning or grinding is completed.

**Definitions:**

Porosity signifies gas pockets or any similar generally globular type voids.

Fusion-type defect signifies slag inclusions and similar elongated defects.

**7. REINFORCING STEEL GENERAL**

Provisions are made herein for the welding of reinforcing steel by the manual shielded metal-arc process. Other processes may be permitted with the specific approval of the Engineer or may be specified on the plans.

Splicing of reinforcing steel by welding shall be done only at locations approved by the Engineer.

## 8. BASE METAL

Reinforcing steel to be welded shall be new billet steel conforming to ASTM Designation: A615. and shall also conform to the following chemical composition:

Maximum Carbon	0.40 Percent
Maximum Manganese	1.30 Percent

## 9. FILLER METAL

Low hydrogen electrodes as specified in Table 1 will be required for all welding or reinforcing steel. Drying of electrodes shall be as specified in Article, "Filler Metal" for Structural Steel.

## 10. PREHEAT AND INTERPASS TEMPERATURE

Minimum preheat and interpass temperatures shall be as shown in Table 3.

TABLE 3

CARBON RANGE	NO. 7 & SMALLER	NO. 8 & LARGER
Up to and including 0.30	None	100
0.31 to 0.35 inclusive	None	150
0.36 to 0.40 inclusive	100	250
Unknown	250	400

For widening projects, use carbon content and bar size of new steel to determine preheat required.

## 11. JOINT TYPES

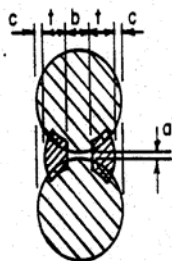
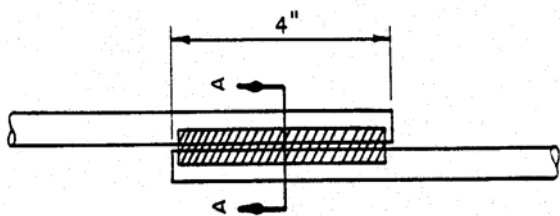
For all bars No. 8 and larger, butt splices will be required. For No. 7 bars and smaller, lap splices will be required.

Fillet welds in lap splices shall be minimum of 4 inches in length and shall be welded on each side of the lap joint. For bars No. 5 and smaller, welding from one side of the lap will be permitted by the Engineer, when it is impractical to weld from both sides of the joint, and the weld shall be a minimum of 6 inches in length.

Lap welds shall meet the requirements specified in Table 4.

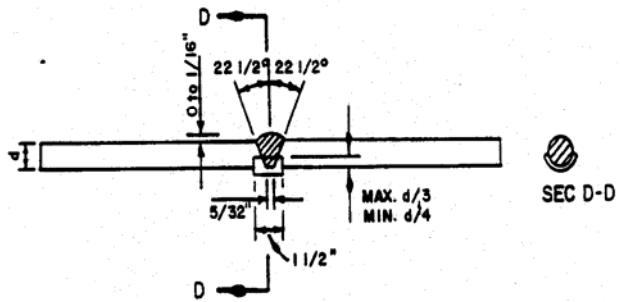
Where possible, all butt splices shall be made in the flat position. All butt splices, except horizontal, shall be as shown in Figure 2 with the back-up strip required. Horizontal splices shall be as shown in Figure 3.

BAR SIZE	"a"	"b" (MAX.)	"t" (MIN.)	"c" (MAX.)	ELECTRODE SIZE
No. 4	.04 in.	1/8 in.	1/8 in.	1/16 in.	1/8 in.
No. 5	.05 in.	1/8 in.	1/16 in.	1/16 in.	5/32 in.
No. 6	.06 in.	1/8 in.	1/4 in.	1/16 in.	5/32 in.
No. 7	.07 in.	3/16 in.	5/16 in.	1/16 in.	5/32 in.



SEC. A-A (ENLARGED)

TABLE 4  
Required Dimensions for Lap Splices



Butt weld in flat position



BUTT WELD WITH BAR IN HORIZONTAL POSITION

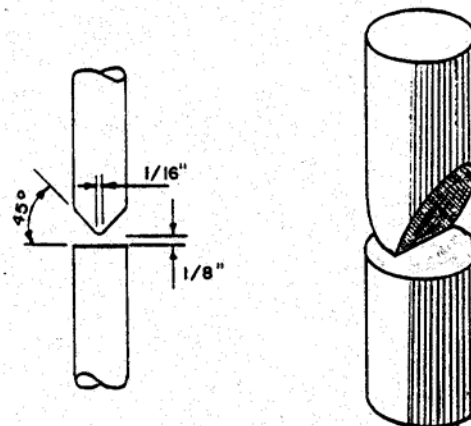


Figure 2

Figure 3



## 12. WIDENING PROJECTS

In general, the new reinforcing steel shall be either lap or butt spliced directly to the bar to be extended. When the reinforcement in the old portion of a structure is found to be of the wrong spacing, dowel bars long enough to develop the welded lap or butt splice and also develop the bar in bond, as required in the specification, "Reinforcing Steel", shall be welded to the old steel, and the new reinforcement placed at the correct spacing without welding to the old steel. No measurement or payment will be made for the dowels but will be subsidiary to the other items in the contract.

Both old and new reinforcement shall be cleaned thoroughly prior to the preparation of the joint.

## 13. RADIOGRAPHIC INSPECTION

When so designated on the plans, welded butt splices shall be radiographed. Weld quality shall be as follows: There shall be no cracks and the sum of the greatest dimensions of porosity and fusion-type defects shall not exceed one-tenth of the nominal bar diameter in inches.

## 14. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the proposal, Welding shall not be measured for pay but will be considered subsidiary.

SECTION 053700  
LANDFILL VEHICLE WEIGHT SCALE SYSTEM (S-119)

1. DESCRIPTION

This specification shall govern all work and materials necessary to furnish, construct, install, and calibrate, and place scales into operation scales, data base system and remote terminal required to complete the project.

2. GENERAL

2.1 Requirement:

The Contractor shall furnish and install two vehicle weight scale systems complete with computer terminals and a remote office terminal. The weight scales will be used for weighing vehicles, consisting mostly of garbage packer trucks, entering in the City's landfills. The City has two landfills, the Elliott Landfill at 7002 Greenwood and the Westside Landfill located at 3702 Carbon Plant Road. The complete weight scale and data base system shall fully document vehicle weighing operations; also upon request provide various detailed reports, monthly customer invoices, and provide a complete accounting system of accounts receivable and revenues as described in the following specifications.

Computer terminals shall be installed at each landfill location along with scales and remote terminal shall be installed at the Solid Waste Services Office. Computer terminal for the Westside Landfill shall be portable.

2.2 Warranty:

The Contractor shall provide the City with a manufacturer's warranty covering all materials, labor, and freight. The warranty period shall begin upon acceptance of the completed project by the City. The warranty period shall be as follows:

Scale	3 Years
All Other	2 Years

The Contractor shall be responsible for all system maintenance for the first year of the warranty period.

3. MATERIALS

3.1 Scale:

Two (2) required, one for the Elliott Landfill and one for the Westside Landfill.

Minimum Dimensions:	10 feet width x 60 feet long
Weight Capacity:	60 ton (minimum)
Section Capacity:	40 tons
Scale Type:	Pitless low profile - fully electronic or electronic mechanical.
Weightbridge Design:	Shall meet American Railroad Engineering Association (AREA) specifications for bridge deflection with 40,000 lb. tandem axle load placed in the center of any module.
Deck Type:	Steel

Platform Checking:           Checking of platform shall be by bumper bolts.

Scale Side Rails:           Side rails shall be a minimum of 6" high, either integral or bolt-on structural steel, radiused to prevent damage to hubs and tires.

Paint Specifications:       All metal surfaces shall be sandblasted to white metal (SP-5; before coating with 2 part catalyzed Epoxy). Any portion of the finish which is damaged by field installation shall be reblasted and recoated.

3.2 Data Base System:

Three (3) required. Systems shall be installed at the scale locations, one at Elliott, one at Westside Landfills and one system at the Solid Waste Services Office. The system for the Elliott Landfill and the Solid Waste Services Office shall be linked by telephone data circuit line for daily down loading of daily transactions from Elliott Landfill to the office. The system for the Westside Landfill shall be portable type and down load daily transactions onto a diskette for up loading transactions onto office computer.

HARDWARE:

Computer:                   Elliott Landfill and Solid Waste Services Office

Processor   -                Shall have a 80286 CPU  
                               Shall have a minimum clock speed at 10 mhz  
                               Shall have a functional 80287 math co-processor

Memory -                    Shall be 640K RAM capacity  
                               Shall have 1 mb on the system board expandable to 2mb  
                               Shall be able to expand to 16mb using cards

Security -                  Shall include a security key lock  
                               Shall include a security lock down device

Clock/  
 Calendar -                  Shall include an internal battery powered system clock/calendar

Storage -                    Shall have one internal 5 1/4" disk drive capable of reading/writing .36 or 1.2mb 5 1/4" diskettes  
                               Shall have one (1) 20mb fixed disk or larger with (40 ms) access time or faster at each landfill 60mb fixed disk at Solid Waste Services Office

Ports -                      Must include the serial port, one parallel port, and one mouse port

Mode -                      Shall be internal with a 2400 baud

**Westside Landfill**

Same as above except security, modem and mouse port will not be required.

Keyboard -                  Elliott and Solid Waste Services Office

                              °           Keyboard must include an IBM enhanced 101 keyboard or equivalent

Westside Landfill

- Shall be minimum of 84 key keyboard, detachable
- Display Monitor - Elliott and Solid Waste Services Office
- Shall be a 14" color display
  - Shall support all VGA Modes ◦ Shall include a tilt and swivel base
  - Shall address at least 640 x 480 pixels (graphic mode)
  - Shall have provisions to connect with existing PC/AT and PS/2 class machines through direct connections or by use of adapter

Westside Landfill

- Shall be integral to computer unit
- Shall be 6" display minimum
- Shall support all CGA modes
  - Shall be Gas Plasma Display

Printer - Solid Waste Services Office

- Shall be Okidata Microline 321 or equivalent
- Shall support high resolution APA Graphics
- Shall print 300 cps or faster in draft mode
- Shall print 63 cps or faster in NLQ mode
- Shall have front panel controls wide carriage
- Shall attach via parallel printer cable
- Shall support continuous - forms feed, single sheet feed (manual) and envelope feed (manual)
- Shall include ribbon, parallel printer cable, adapters and documentation necessary to make operational in addition to printer drive
- Shall support 3" to 16.5" paper width for cut sheets
- Shall support 3" to 15" paper width for continuous forms
- Shall support word processing software

Elliott and Westside Landfills

- Shall be EPSON FX S50 or equivalent
- Must print 264 cps or faster in draft form
- Must print 54 cps or faster in NLQ form
  - Shall have front panel controls
  - Shall attach via parallel printer cable
  - Shall support 80 column paper

Scale Indicator - Elliott Landfill and Westside Landfills (only)

- Shall be housed in a dust tight metal enclosure designed for desk-top mounting
- Shall be programmed and calibrated through keyboard

- data entry only
- Shall provide Serial ASCII data output of gross weights in 20MA current loop, R232C and RS422 modes
- Shall provide selectable on demand or continuous data output, with baud rate selections from 300 to 9600
- Shall provide adjustable low pass digital filters to dampen scale vibration on motion while maintaining a responsive display and fast settling time
- Shall have selectable automatic zero maintenance to compensate for weight vibrations
- Shall have selectable motion detection to inhibit zero and print functions while scale display is changing
- Shall have a minimum of six digit display

**SOFTWARE:** The software system shall be capable of printing weight tickets, general management reports, accounting reports, monthly invoices and performing accounting procedures as described herein. Software shall have several security levels to prevent unauthorized access. Weight and cash tickets are the only thing to be printed at landfill location, all other reports, invoices, and accounting capabilities shall be handled in the Solid Waste Services Office. Complete documentation and support shall be provided with software. Software **shall not be copy protected** and shall be easily installed on hard disk.

The system shall have the capacity to handle the following:

- Cash Accounts - 1,000 daily transactions and separate receipt numbers from other accounts
- City Garbage Collection Accounts with 75 vehicle capacity and is not to be included in monthly revenues accounting program, but information accessible by management report programs
- 300 commercial monthly billed accounts of which 25 accounts shall have 50 vehicle capacity and 275 accounts shall have 10 vehicle capacity
- 50 material categories with different rates (\$) per category
- Ability to enter manually (at Solid Waste Services Office only) information on customers activities while scales were inoperable and hand written tickets were given out with estimates of trash volume (cubic yards)
- Grid System information to identify placement of waste within landfill
- Shall distinguish accounts for each landfill by a code number
- Ability to keep count of anything driving onto the scale which weighs more than 2000 lb. whether a weight ticket was printed or not

Weight

Tickets - The system shall print weight tickets as vehicles are weighed. Printed tickets shall include the following information:

- Landfill name and code number
  - Ticket number
  - Customer name, account number, address, zip, and phone number
  - Vehicle ID number
  - Vehicle license number
  - Vehicle gross weight

- Vehicle tare weight
- Vehicle net weight
- Material category
- Time and day vehicle was weighed
- Total charge (\$)

A place for the attendant to initial and for the vehicle driver to sign

Cash Tickets - The system shall print cash receipt tickets for vehicles not being weighed. Printed tickets shall include the following information:

- Landfill name and code number
- Ticket number
- Vehicle license number
- Estimate of volume in cubic yards
- Material category
- Time and day of transaction
- Attendants initials
- Total charge (\$)

Management

Reports - System shall be able to print reports for any specified time period and shall sort by landfill, customer, and material category the following information and provide cumulative summary of specified items:

- Customer account number, name, address, zip, and phone number
- Landfill name
- Optional customer vehicle information (printed only when requested)

Vehicle ID number  
 Vehicle license number  
 Material category  
 Grid ID where material was placed

Total weight per material category

- Total weight for customers vehicles (by material category)
- Total number of vehicles per customer
- Rate for material category (\$/ton or \$/cubic yard)
- Total charge (\$) per customer
- A summary of the cumulative totals of revenue generated (\$ number of vehicles, tons by material category, cubic yards by material category)

ACCOUNTING

CAPABILITIES The system shall provide the capability to perform daily and monthly accounting procedures used to verify daily bank deposits and track monthly accounts receivable and payments as follows.

Daily Cash

Accounts - Daily cash transactions shall be kept separate from entries for monthly invoices. Each cash entry/transaction shall be identified by consecutive receipt number. A cash total for each daily work shift (2 minimum) and an end of day total shall be required and printed upon request.

Monthly

Accounts - The system shall have the capability to store accounts receivable by account number order and charges to each customer for each calendar month.

An itemized list of account receivable (debits) for all customer accounts being invoiced shall be printed at the end of the month showing monthly totals and grand totals.

As payments (credits) are received for an individual account, the system shall have the ability to recall the debit accounts receivable balance, to which the payment entry would allow zeroing of the owed amount if account was paid in full or applying partial payment (as the case may be), leaving an unpaid balance (arrears) for that month.

All payments entered within the month shall be stored until the end of the month at which time an itemized list of payments shall be printed.

Unpaid balances shall be stored and shall be shown as an arrears amount on the next month's invoices.

Unpaid accounts receivables shall be stored for one year to coincide with a fiscal audit.

Monthly

Invoices - System shall be able to print monthly invoices for customers and segregate customers activity by landfill. Invoices shall include the following information:

- Customer account number, name, address, zip, and phone number
- Payment due date with optional message space
- Arrears amount (\$)
- Landfill name and code number
- Customer vehicle information
  - Vehicle ID number
  - Vehicle License plate number
  - Vehicle gross weight
  - Vehicle tare weight
  - Vehicle net weight and/or cubic yards
- Time and date vehicle was weighed
  - Material category
  - Rate charge
  - Total charge (\$) per vehicle
  - Total charge per customer

4. SCALE AND DATA BASE SYSTEM INSTALLATION:

- Contractor shall furnish all labor and materials to install, calibrate and place into satisfactory operation two vehicle weight scales with computer terminal systems, one each at the Elliott

Landfill and at the Westside Landfill and a remote scale computer terminal at the City's Solid Waste Services Office located at 2525 Hygeia. The Contractor shall have a qualified software analyst and programmer available on the jobsite to supervise set-up and system start-up. This work shall include earth excavation for scale foundation, foundation form work, pouring concrete foundation, backfilling and compacting solid around foundation, offloading scale from haulers truck, scale installation on foundation, installation of computer terminal with scale indicator and printer and associated wiring, scale calibration and systems start up and trouble shooting.

- ° Each scale and data base system installation shall be completed and operating within 15 working days from start of installation. Foundation installation shall be scheduled to start as close as possible to scale delivery date to minimize interrupting standard operations at the Westside Landfill. Contractor shall have the option to install scales and data base system simultaneously or consecutively with the Westside being first.
- ° Installation of scales and Data Base Systems shall be limited to office working hours (8 a.m. - 5:00 p.m. Monday thru Friday) and landfill hours (7:00 a.m. - 7:00 p.m. Monday thru Friday).
- ° Scale shall be installed in accordance with the National Bureau of Standards Handbook 44 Specifications and Recommendations.
- ° Scale shall be installed at a distance no greater than 10 feet from the scale building at each landfill site.
- ° All wiring from scale to building shall be in sealed rigid conduit a minimum of 12" below ground surface and rigid conduit shall extend up to location where wire enters building.
- ° Reinforced concrete foundation designed for a soilbearing pressure of 1,500 pounds per square foot for scales shall be installed as specified on certified foundation drawing furnished by the scale manufacturer.
- ° Concrete foundations design and installation shall conform to standard specifications Section 030020, Section 038000 and Section 032020 as attached in part S of these specifications.
- ° Concrete shall have a minimum of 3000 pounds per square inch compressive strength.
- ° Load bearing portions of the foundation shall extend across the entire width of the foundation.
- ° For the Elliott Landfill (only) non-load bearing portion in between load bearing portions of the foundation shall be concrete, a minimum of 4" deep reinforced with Welded Wire Mesh (6x6x6).
- ° The entrance and exit ramps of the scale shall be concrete, with minimum thickness of 6".
- ° The entrance and exit ramps of the scale shall have a 10 feet level section and an additional ramp with a slope of not more than 1 inch vertical to 1 foot horizontal.



## 5. SUBMITTALS

The Contractor shall furnish the Engineer with four (4) sets of complete operation and maintenance manuals. The manuals shall be bound in a three ring binder and shall include the following information:

1. Detailed shop drawings of scale and foundation
2. Detailed specifications of all components
3. Wiring diagrams
4. Software with documentation
5. Name, address, phone number of manufacturers supplying components of system
6. List of manufacturer's recommended replacements/spare parts with prices

## 6. TECHNICAL SUPPORT

The contractor shall have a qualified software and programmer analyst on site to supervise set-up and system start-up.

The software manufacturer shall conduct a two day operator training course.

The software manufacturer shall provide free technical support of software by phone during normal business hours.

## 7. MEASUREMENT AND PAYMENT

Vehicular scales and data base systems shall be described in the proposal and shall include furnishing, constructing, and installing all materials and equipment; providing all labor, equipment, and incidentals required to complete the job complete, in place.

**SECTION 053820  
PRE-FABRICATED STEEL BRIDGE**

**1.0 GENERAL**

1.1 Scope

These specifications are for a fully engineered clear span bridge of steel construction and shall be regarded as minimum standards for design and construction. These specifications are based on products designed and manufactured by Continental Bridge, 8301 State Highway 29 North, Alexandria, MN 56308, or an approved equal.  
Phone: 1-800-328-2047 or (320) 852-7500 Fax: 320-852-7067  
E-mail: conbridg@continentalbridge.com

1.2 Qualified Suppliers

Each bidder is required to identify their intended bridge supplier as part of the bid submittal. Qualified suppliers must have at least 5 years experience fabricating these type structures.

Pre-approved Manufacturers:

Continental Bridge  
8301 State Highway 29 North  
Alexandria, Minnesota 56308  
1-800-328-2047

Suppliers other than those listed above may be used provided the engineer or owner's agent evaluates the proposed supplier and approves the supplier 5 days prior to bid.

The contractor must provide the following documentation, for any proposed supplier who is not pre-approved, at least 10 days prior to bid:

- \* Product Literature
- \* All documentation to insure the proposed substitution will be in compliance with these specifications. This shall include:
  - Representative design calculations
  - Representative drawings
  - Splicing and erection procedures
  - Warranty information
  - Inspection and Maintenance procedures
  - AISC Shop Certification
  - Welder Qualifications
- \* Proposed suppliers must have at least five (5) years experience designing and fabricating these type structures and a minimum of five (5) successful bridge projects, of similar construction, each of which has been in service at least three (3) years. List the location, bridge size, owner, and a contact for reference for each project.

The engineer will evaluate and verify the accuracy of the submittal prior to bid. If the engineer determines that the qualifying criteria have not been met, the contractor's proposed supplier shall be rejected. The engineer's ruling shall be final.

## 2.0 GENERAL FEATURES OF DESIGN

### 2.1 Span

Bridge span shall be 75'-0" (straight line dimension) and shall be as measured from each end of the bridge structure.

### 2.2 Width

Bridge width shall be 6'-0" and shall be as measured from the inside face of structural elements at deck level.

### 2.3 Truss Type

Bridge shall be designed as a half-through "Pratt" truss with one (1) diagonal per panel and square end vertical members. All end vertical members, unless specified otherwise, shall be plumb. Interior vertical members shall be perpendicular to the chord faces.

2.3.1 Bridge shall be designed utilizing an underhung floor beam (top of floor beam welded to the bottom of the bottom chord).

2.3.2 The distance from the top of the deck to the top and bottom truss members shall be determined by the bridge manufacturer based upon structural and/or shipping requirements.

2.3.3 The top of the top chord shall not be less than 42 inches above the deck (measured from the high point of the deck) on bridges used for pedestrian traffic.

### 2.4 Member Components

All members of the vertical trusses (top and bottom chords, verticals, and diagonals) shall be fabricated from square and/or rectangular structural steel tubing. Other structural members and bracing shall be fabricated from structural steel shapes or square and rectangular structural steel tubing.

To provide lateral support for the top flange of open shape stringers (w-shapes or channels), a minimum of one stiffener shall be provided in each stringer at every floor beam location.

### 2.5 Attachments

#### 2.5.1 Safety Rails

Horizontal safety rails shall be placed on the structure up to a minimum height of 3'-6" above the deck surface. Safety rails shall be placed so as to prevent a 4" sphere from passing through the truss. Safety rails shall be round, square or rectangular tubing welded to the inside or outside of the structure at the bridge fabricators option. Tubular safety rails shall have their ends capped and ground smooth so as to produce no sharp edges.

The safety rail system shall be designed for an infill loading of 200 pounds, applied horizontally at right angles, to a one square foot area at any point in the system.

### 2.6 Camber

The bridge shall have a vertical camber dimension at midspan equal to 100% of the full dead load deflection plus 2% of the full length of the bridge.

## 2.7 Elevation Difference

The bridge abutments shall be constructed at the same elevation on both ends of the bridge.

## 3.0. ENGINEERING

Structural design of the bridge structure(s) shall be performed by or under the direct supervision of a licensed professional engineer and done in accordance with recognized engineering practices and principles. The engineer shall be licensed to practice in Texas.

### 3.1 Design Loads

In considering design and fabrication issues, this structure shall be assumed to be statically loaded. No dynamic analysis shall be required nor shall fabrication issues typically considered for dynamically loaded structures be considered for this bridge.

#### 3.1.1 Dead Load

The bridge structure shall be designed considering its own dead load (superstructure and original decking) only. No additional dead loading need be considered.

#### 3.1.2 Uniform Live Load

##### 3.1.2.1 Pedestrian Live Load

Main Members: Main supporting members, including girders, trusses and arches shall be designed for a pedestrian live load of 100 pounds per square foot of bridge walkway area. The pedestrian live load shall be applied to those areas of the walkway so as to produce maximum stress in the member being designed.

Secondary Members: Bridge decks and supporting floor systems, including secondary stringers, floor beams and their connections to main supporting members shall be designed for a live load of 100 pounds per square foot, with no reduction allowed.

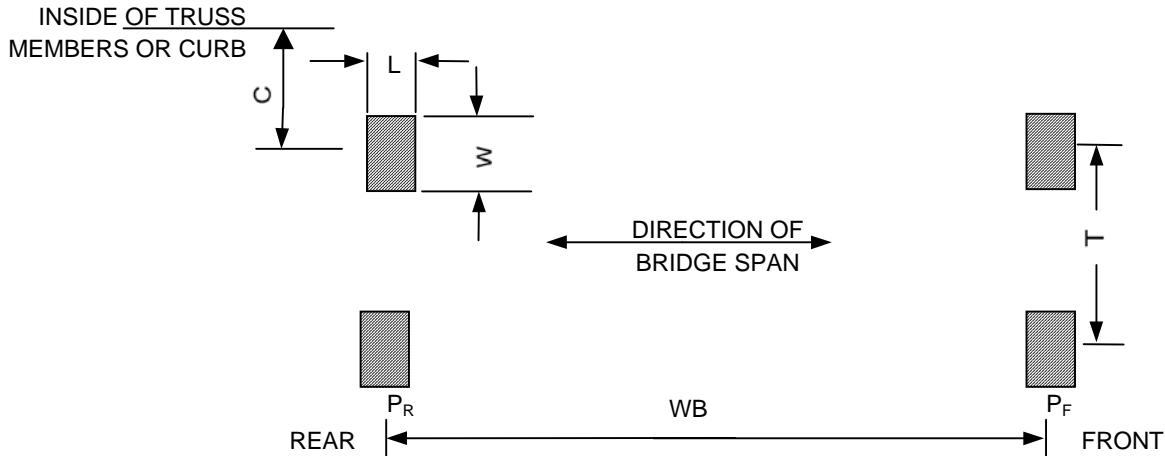
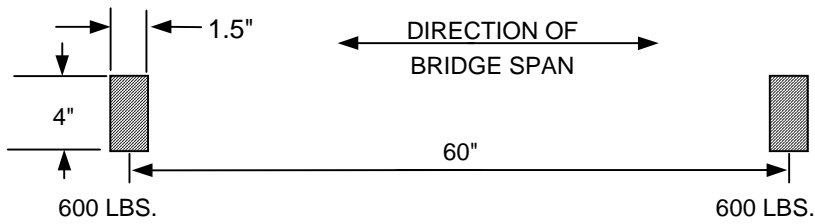
#### 3.1.3 Vehicle Loads

The bridge superstructure, floor system and decking shall be designed for each of the following point load conditions:

3.1.3.1 A concentrated load of 1000 pounds placed on any area 2.5 ft x 2.5 ft square.

3.1.3.2 A 1200 pound two wheel vehicle with a wheelbase and tire print area as shown in the following diagram:

3.1.3.3 A 6,000 pound four wheeled vehicle with the appropriate wheelbase, tire track and tire print area as shown in the following diagram: (See Table I for the values corresponding to the selected vehicle.)



Vehicle	Axle and Wheel Spacings		Front Wheels			Rear Wheels			C*
	WB	T	P <sub>F</sub>	L	W	P <sub>R</sub>	L	W	
4,000 #	48"	32"	1,000 #	2.0"	5.0"	1,000 #	2.0"	5.0"	9"
6,000 #	66"	48"	1,500 #	2.5"	6.0"	1,500 #	2.5"	6.0"	12"

(\*C is the minimum dimension from center of wheel to the inside face of truss or curb. )

TABLE I

All of the concentrated or wheel loads shall be placed so as to produce the maximum stress in each member being analyzed. Critical stresses need be calculated assuming there is only one vehicle on the bridge at any given time. Assumptions that vehicles only travel down the center of the bridge or that the vehicle load is a uniform line load will not be allowed.

Each four wheeled vehicle load listed in Table I, up to and including the maximum weight vehicle selected, must be used in determining critical deck stresses. The wheel distribution for deck design shall be as specified in Section 4.3.1. Stringers shall be designed for the applied wheel loads assuming no lateral load distribution to adjacent stringers.

A vehicle impact allowance is not required.

### 3.1.4 Wind Load

#### 3.1.4.1 Horizontal Forces

The bridge(s) shall be designed for a wind load of 35 pounds per square foot on the full vertical projected area of the bridge as if enclosed. The wind load shall be applied horizontally at right angles to the longitudinal axis of the structure.

The wind loading shall be considered both in the design of the lateral load bracing system and in the design of the truss vertical members, floor beams and their connections.

#### 3.1.4.2 Overturning Forces

The effect of forces tending to overturn structures shall be calculated assuming that the wind direction is at right angles to the longitudinal axis of the structure. In addition, an upward force shall be applied at the windward quarter point of the transverse superstructure width. This force shall be 20 pounds per square foot of deck.

#### 3.1.7 Top Chord Railing Loads

The top chord, truss verticals, and floor beams shall be designed for lateral wind loads (per section 3.1.4.1) and for any loads required to provide top chord stability as outlined in Section 3.3.6; however, in no case shall the load be less than 50 pounds per lineal foot or a 200 pound point load, whichever produces greater stresses, applied in any direction at any point along the top chord.

#### 3.1.9 Load Combinations

The loads listed herein shall be considered to act in the following combinations, whichever produce the most unfavorable effects on the bridge superstructure or structural member concerned.

[DL=Dead Load; LL = Live Load; WL = Wind Load; VEH = Vehicle Load]

DL + LL  
DL + VEH  
DL+WL  
DL+LL+WL  
DL+VEH+.3WL

NOTE: Allowable stresses may be increased 1/3 above the values otherwise provided when produced by wind loading, acting alone or in combination with the design dead and live loads.

It shall be the responsibility of the foundation engineer to determine any additional loads (i.e. earth pressure, stream force on abutments, wind loads other than those applied perpendicular to the long axis of the bridge, etc.) and load combinations required for design of the abutments.

### 3.2 Design Limitations

#### 3.2.1 Deflection

##### 3.2.1.1 Vertical Deflection

The vertical deflection of the main trusses due to service pedestrian live load shall not exceed 1/400 of the span.

The vertical deflection of cantilever spans of the structure due to service pedestrian live load shall not exceed 1/300 of the cantilever arm length.

The deflection of the floor system members (floor beams and stringers) due to service pedestrian live load shall not exceed 1/360 of their respective spans.

The service pedestrian live load shall be 100 PSF for deflection checks.

Deflection limits due to occasional vehicular traffic shall not be considered.

#### 3.2.1.2 Horizontal Deflection

The horizontal deflection of the structure due to lateral wind loads shall not exceed 1/500 of the span under 35 PSF wind load.

#### 3.2.2 Minimum Thickness of Metal

The minimum thickness of all structural steel members shall be 3/16" nominal and be in accordance with the AISC Manual of Steel Construction's "Standard Mill Practice Guidelines". For ASTM A500 and ASTM A847 tubing, the section properties used for design shall be per the Steel Tube Institute of North America's Hollow Structural Sections "Dimensions and Section Properties".

### 3.3 Governing Design Codes / References

Structural members shall be designed in accordance with recognized engineering practices and principles as follows:

#### 3.3.1 Structural Steel Allowable Stresses

American Institute of Steel Construction (AISC).

Structural steel design shall be in accordance with those sections of the "Manual of Steel Construction: Allowable Stress Design" related to design requirements and allowable stresses.

#### 3.3.2 Welded Tubular Connections

American National Standards Institute / American Welding Society (ANSI/AWS) and the Canadian Institute of Steel Construction (CISC).

All welded tubular connections shall be checked, when within applicable limits, for the limiting failure modes outlined in the ANSI/AWS D1.1 Structural Welding Code or in accordance with the "Design Guide for Hollow Structural Section Connections" as published by the Canadian Institute of Steel Construction (CISC).

When outside the "validity range" defined in these design guidelines, the following limit states or failure modes must be checked:

- \* Chord face plastification
- \* Punching shear (through main member face)
- \* Material failure
  - Tension failure of the web member
  - Local buckling of a compression web member
- \* Weld failure
  - Allowable stress based on "effective lengths"
  - "Ultimate" capacity
- \* Local buckling of a main member face

- \* Main member failure:
  - Web or sidewall yielding
  - Web or sidewall crippling
  - Web or sidewall buckling
  - Overall shear failure

All tubular joints shall be plain unstiffened joints (made without the use of reinforcing plates) except as follows:

- \* Floor beams hung beneath the lower chord of the structure may be constructed with or without stiffener (or gusset) plates, as required by design.
- \* Floor beams which frame directly into the truss verticals (H-Section bridges) may be designed with or without end stiffening plates as required by design.
- \* Where chords, end floor beams and in high profiles the top end struts weld to the end verticals, the end verticals (or connections) may require stiffening to transfer the forces from these members into the end vertical.
- \* Truss vertical to chord connections.

NOTE: The effects of fabrication tolerances shall be accounted for in the design of the structure. Special attention shall be given to the actual fit-up gap at welded truss joints.

NOTE: Open ends of tubes on painted structures shall be capped and seal welded.

### 3.3.3 Bolted Splices

American Institute of Steel Construction (AISC) and the Research Council on Structural Connections of the Engineering Foundation (RCSC).

Bolted splice design shall be in accordance with Section J3 of the "Manual of Steel Construction: Allowable Stress Design". Splices shall be designed for the actual load in the member but in no case for less than 50% of the effective strength of the member.

Bolted field splices shall be located on the bridge so as to produce a structure which can be economically shipped and erected. Splices along the length of the bridge (in chords and diagonals) shall be placed at the approximate mid point of a bay (between two panel points). Splices across the width of the bridge (in floor beams and wind braces) may be used, when necessary, to keep the overall structure width within reasonable limits for shipping.

### 3.3.6 Top Chord Stability

Structural Stability Research Council (SSRC), formerly Column Research Council.

The top chord of a half-through truss shall be considered as a column with elastic lateral supports at the panel points. The critical buckling force of the column, so determined, shall exceed the maximum force from dead load and live load (uniform or vehicular) in any panel of the top chord by not less than 50 percent for parallel chord truss bridges or 100 percent for tied arch bridges. The design approach to prevent top chord buckling shall be as outlined by E.C.

Holt's research work in conjunction with the Column Research Council on the



stability of the top chord of a half-through truss. See Appendix A for the calculation of the spring constant C and the determination of an appropriate K factor for out-of-plane buckling.

In addition, for the dead load plus vehicle load combination, the spring constant "C" furnished by the transverse "U-Frames" shall not be less than "C" required as defined by:

$$C \text{ required} = \frac{1.46 P_c}{L}$$

where  $P_c$  is the maximum top chord compression due to dead load plus the vehicle load times the appropriate safety factor (1.5 for parallel chord truss bridges or 2.0 for tied arch truss bridges) and L is the length in inches of one truss panel or bay.

For uniformly loaded bridges, the vertical truss members, the floor beams and their connections (transverse frames) in half-through truss spans shall be proportioned to resist a lateral force of not less than 1/100k times the top chord compressive load, but not less than .004 times that top chord load, applied at the top chord panel points of each truss. The top chord load is determined by using the larger top chord axial force in the members on either side of the "U-frame" being analyzed. For end frames, the same concept applies except the transverse force is 1% of the axial load in the end post member.

For bridges with vehicle loads, the lateral force applied at the top chord elevation for design of the transverse frames shall not be less than 1% of the top chord compression due to dead load plus any vehicle loading.

The bending forces in the transverse frames, as determined above, act in conjunction with all forces produced by the actual bridge loads as determined by an appropriate analysis which assumes that the floor beams are "fixed" to the trusses at each end.

NOTE: The effects of three dimensional loading (including "U-frame" requirements) shall be considered in the design of the structure. The "U-frame" forces in half-through spans shall be added to the forces derived from a three dimensional analysis of the bridge.

## 4.0 MATERIALS

### 4.1 Steel

#### 4.1.1 Painted Steel

Bridges which are to be painted shall be fabricated using ASTM A500 grade C cold-formed welded square and rectangular tubing ( $F_y = 50,000$  psi) and/or high strength, low alloy, atmospheric corrosion resistant ASTM A847 cold-formed welded square and rectangular tubing ( $F_y = 50,000$  psi) and/or ASTM A588, ASTM A242, ASTM A572, ASTM A 606 ( $F_y = 50,000$  psi) and/or ASTM A36 ( $F_y = 36,000$  psi) plate and structural steel shapes. Splice plates, if required, shall be ASTM A588.

### 4.2 Bolts

Field splices shall be fully bolted with ASTM A325 type 3 high strength bolts in accordance with the "Specifications for Structural Joints Using ASTM A325 or A490 Bolts".

### 4.3 Decking

#### 4.3.1 Grate decking

This bridge shall be provided with a steel grate deck.

The grate decking shall utilize bearing bars spaced 1-3/16" on center with welded crossbars at 4" centers. The grating shall be designed to carry the imposed deck loads at the stringer or floor beam spacings used in the bridge as determined by the bridge designer.

Grate decking shall be designed for concentrated loads as specified in Section 3.1.3. Grate decking shall be designed using only the bars engaged by the "tire print area" unless cross bars suitable for transverse load distribution are utilized. Grating shall be galvanized in accordance with ASTM A123 with smooth bearing bars.

## 5.0 WELDING

### 5.1 Welding

Welding and weld procedure qualification tests shall conform to the provisions of ANSI/AWS D1.1 "Structural Welding Code", 1996 Edition. Filler metal shall be in accordance with the applicable AWS Filler Metal Specification (i.e. AWS A 5.28 for the GMAW Process). For exposed, bare, unpainted applications of corrosion resistant steels (i.e. ASTM A588 and A847), the filler metal shall be in accordance with AWS D1.1, Section 3.7.3.

### 5.2 Welders

Welders shall be properly accredited operators, each of whom shall submit certification of satisfactorily passing AWS standard qualification tests for all positions with unlimited thickness of base metal, have a minimum of 6 months experience in welding tubular structures and have demonstrated the ability to make uniform sound welds of the type required.

## 6.0 SUBMITTALS

### 6.1 Submittal Drawings

Schematic drawings and diagrams shall be submitted to the customer for their review after receipt of order. Submittal drawings shall be unique drawings, prepared to illustrate the specific portion of the work to be done. All relative design information such as member sizes, bridge reactions, and general notes shall be clearly specified on the drawings. Drawings shall have cross referenced details and sheet numbers. All drawings shall be signed and sealed by a Professional Engineer who is licensed in accordance with Section 3.0.

### 6.2 Structural Calculations

Structural calculations for the bridge superstructure shall be submitted by the bridge manufacturer and reviewed by the approving engineer. All calculations shall be signed and sealed by a Professional Engineer who is licensed in accordance with Section 3.0. The calculations shall include all design information necessary to determine the structural adequacy of the bridge. The calculations shall include the following:

- \* All AISC allowable stress checks for axial, bending and shear forces in the critical member of each truss member type (i.e. top chord, bottom chord, floor beam, vertical, etc.).
- \* Checks for the critical connection failure modes for each truss member type (i.e. vertical, diagonal, floor beam, etc.). Special attention shall be given to all welded tube on tube connections (see section 3.3.2 for design check

053820

Rev 11/24/99

Page 9 of 14

requirements).

- \* All bolted splice connections.
- \* Main truss deflection checks.
- \* U-Frame stiffness checks (used to determine K factors for out-of-plane buckling of the top chord) for all half through or "pony" truss bridges.
- \* Deck design.

NOTE: The analysis and design of triangulated truss bridges shall account for moments induced in members due to joint fixity where applicable. Moments due to both truss deflection and joint eccentricity must be considered.

6.3 Welder certifications in compliance with AWS standard qualification tests.

6.4 Welding procedures in compliance with Section 5.1.

## 7.0 FABRICATION

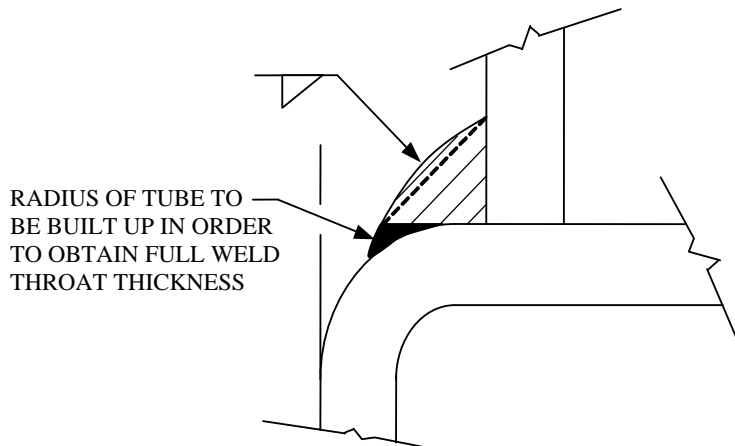
### 7.1 General Requirements

#### 7.1.1 Drain Holes

When the collection of water inside a structural tube is a possibility, either during construction or during service, the tube shall be provided with a drain hole at its lowest point to let water out.

#### 7.1.2 Welds

Special attention shall be given to developing sufficient weld throats on tubular members. Fillet weld details shall be in accordance with AWS D1.1, Section 3.9 (See AWS Figure 3.2). Unless determined otherwise by testing, the loss factor "Z" for heel welds shall be in accordance with AWS Table 2.8. Fillet welds which run onto the radius of a tube shall be built up to obtain the full throat thickness (See Figure 7.1). The maximum root openings of fillet welds shall not exceed 3/16" in conformance with AWS D1.1, Section 5.22. Weld size or effective throat dimensions shall be increased in accordance with this same section when applicable (i.e. fit-up gaps > 1/16").



**FIGURE 7.1  
BUILD UP RADIUS WELD**

The fabricator shall have verified that the throat thickness of partial joint penetration groove welds (primarily matched edge welds or the flare-bevel-groove welds on underhung floor beams) shall be obtainable with their fit-up and weld procedures. Matched edge welds shall be "flushed" out when required to obtain the full throat or branch member wall thickness.

For full penetration butt welds of tubular members, the backing material shall be fabricated prior to installation in the tube so as to be continuous around the full tube perimeter, including corners. Backing may be of four types:

- \* A "box" welded up from four (4) plates.
- \* Two "channel" sections, bent to fit the inside radius of the tube, welded together with full penetration welds.
- \* A smaller tube section which slides inside the spliced tube.
- \* A solid plate cut to fit the inside radius of the tube.

Corners of the "box" backing, made from four plates, shall be welded and ground to match the inside corner radii of the chords. The solid plate option shall require a weep hole either in the chord wall above the "high side" of the plate or in the plate itself. In all types of backing, the minimum fit-up tolerances for backing must be maintained at the corners of the tubes as well as across the "flats".

#### 7.1.3 Sealing and Caulking

To prevent rust runs on painted structures, open ends of all tubes shall be capped and seal welded. Wherever practical, member end connections and steel on steel contact surfaces, such as stringer to floor beam connections, shall be welded all around. Long seams between members or any seam which cannot be practically welded shall be caulked.

#### 7.1.4 Paint Clearance

To provide adequate clearance for initial painting and future recoating, a minimum of a 1-1/2" gap shall be provided between any two opposing painted surfaces. If this gap cannot be maintained, member sizes shall be increased or filler plates added to bring the opposing surfaces in contact for seal welding.

#### 7.2 Quality Certification

Bridge(s) shall be fabricated by a fabricator who is currently certified by the American Institute of Steel Construction to have the personnel, organization, experience, capability, and commitment to produce fabricated structural steel for the category "Simple Steel Bridges" as set forth in the AISC Certification Program. Quality control shall be in accordance with procedures outlined for AISC certification.

### 8.0 FINISHING

#### 8.1 Blast Cleaning

##### 8.1.1 Painted Steel

All exposed surfaces of steel to be painted shall be blast cleaned in accordance with the appropriate section of the Steel Structures Painting Council Surface Preparation Specifications as recommended by the paint manufacturer.

## 8.2 Painting

All exposed steel surfaces shall receive shop applied primer and finish coats. The paint system shall consist of one of the following:

- \* Primer: Carboline 893 Epoxy Primer  
Top Coat: Carbothane 133 HB Polyurethane  
As manufactured by The Carboline Company, 350 Hanley Industrial Court,  
St. Louis, MO 63144-1599 314-644-1000.
- \* Primer: Pitt Guard All Weather DTR Epoxy Primer  
Top Coat: Pitthane Acrylic-Aliphatic Urethane Enamel  
As manufactured by PPG Architectural Finishes, Inc., One PPG Place,  
Pittsburgh, PA 15272 800-441-9695.
- \* Primer: Epoxide 52 Epoxy Primer  
Top Coat: Acrolon 218 HS Acrylic Polyurethane  
As manufactured by Sherwin Williams, PO Box 7570,  
Highlands Ranch, CO 80126-9170 800-336-1110.

Each system shall consist of a minimum of one primer and one top coat applied in accordance with and to the minimum dry film thickness listed in the paint manufacturer's recommendations. The top coat paint color shall be (*specifier to input color choice here*).

NOTE: Unless specified otherwise, connection faying surfaces and the interior surfaces of all structural tubing shall not be coated.

### 8.2.3 Touch-up Paint

A nominal quantity of touch-up paint will be provided to repair marred surfaces. Touch-up painting includes any and all painting required after the structure reaches the site, and is the responsibility of others. This painting shall include, but not be limited to, the following areas:

1. Any areas damaged due to shipping, handling, and erection of the bridge and components.
2. Bolt heads and exposed area of bolts and nuts as applicable.
3. Non-galvanized attachments or anchor bolts if not made of corrosion resistant steel.
4. If applicable, small areas (0" to 2" each side) around bolted field splices, designed as "slip critical", where one or all paint coats may be required to be left off the faying surfaces.

### 8.2.4 Painter Qualifications

All painters shall be certified by the appropriate paint manufacturer for proper handling, mixing, thinning (if required) and application of the paint system in accordance with the manufacturer's instructions. The painters shall also be certified by the Department of Transportation in the state in which the bridge is manufactured.

## 9.0 DELIVERY AND ERECTION

Delivery is made to a location nearest the site which is easily accessible to normal over-the-road tractor/trailer equipment. All trucks delivering bridge materials will need to be unloaded at the time of arrival.

The manufacturer will provide detailed, written instruction in the proper lifting procedures and splicing procedures (if required). The method and sequence of erection shall be the responsibility of Contractor.

The bridge manufacturer shall provide written inspection and maintenance procedures to be followed by the bridge owner.

## **10.0 BEARINGS**

### **10.1 Bearing Devices**

Bridge bearings shall consist of a steel setting or slide plate placed on the abutment or grout pad. The bridge bearing plate which is welded to the bridge structure shall bear on this setting plate. One end of the bridge will be fixed by fully tightening the nuts on the anchor bolts at that end. The opposite end will have finger tight only nuts to allow movement under thermal expansion or contraction.

The bridge bearings shall sit in a recessed pocket on the concrete abutment. Minimum 28-day strength for the abutment concrete shall be 3000 PSI. The bearing seat shall be a minimum of 16" wide. The step height (from bottom of bearing to top-of-deck) shall be determined by the bridge manufacturer.

Bridges in excess of 100 feet in length or bridges with dead load reactions of 15,000 pounds or more (at each bearing location) shall have teflon on teflon or stainless steel on teflon slide bearings placed between the bridge bearing plate and the setting plate. The top slide plate shall be large enough to cover the lower teflon slide surface at both temperature extremes.

## **11.0 FOUNDATIONS**

Unless specified otherwise, the bridge manufacturer shall determine the number, diameter, minimum grade and finish of all anchor bolts. The anchor bolts shall be designed to resist all horizontal and uplift forces to be transferred by the superstructure to the supporting foundations. Engineering design of the bridge supporting foundations (abutment, pier, bracket and/or footings), including design of anchor bolt embedments, shall be the responsibility of the foundation engineer. The contractor shall provide all materials for (including anchor bolts) and construction of the bridge supporting foundations. The contractor shall install the anchor bolts in accordance with the manufacturer's anchor bolt spacing dimensions.

Information as to bridge support reactions and anchor bolt locations will be furnished by the bridge manufacturer after receipt of order and after the bridge design is complete.

## **12.0 PAYMENT**

A partial payment or "deposit" for the prefabricated bridge shall be made upon order and storage as required by the terms of the manufacturer.

## **13.0 WARRANTY**

The bridge manufacturer shall warrant their steel truss structure(s) to be free of design, material and workmanship defects for a period of fifteen years from the date of delivery. This warranty does not include decking, railing attachments, on any other items not part of the steel truss structure.

This warranty shall not cover defects in the bridge caused by abuse, misuse, overloading, accident, improper maintenance, alteration or any other cause not the result of defective materials or workmanship. This warranty shall be void unless owner's records, which will indicate compliance with the minimum guidelines

053820

Rev 11/24/99

Page 13 of 14

specified in the Inspection and Maintenance Procedures, can be supplied.

Repair or replacements shall be the exclusive remedy for defects under this warranty. The bridge manufacturer shall not be liable for any consequential or incidental damages for breach of any express or implied warranty on their structures.

#### 14.0 APPROVAL CHECKLIST

The following checklist will be used in the evaluation of all submittals to assure compliance with the Special Specifications for Prefabricated Bridge. This checklist is considered the minimum acceptable requirements for compliance with these specifications. Any deviations from this checklist shall be considered grounds for rejection of the submittal. Any costs associated with delays caused by the rejection of the submittal, due to non-compliance with this checklist, shall be fully borne by the contractor and bridge supplier.

#### SUBMITTAL DRAWINGS

Data Required to be Shown:

Bridge Elevation  
Bridge Cross Section  
All Member Sizes  
All Vertical Truss Members are Square  
or Rectangular Tubing  
Bridge Reactions  
General Notes Indicating  
AISC Stress Conformance  
Material Specifications to be Followed  
Design Live Load  
Design Vehicle Load (If Applicable)  
Design Wind Load  
Other Specified Design Loads  
Welding Process  
Blast Cleaning  
Paint System to be Used (If Applicable)  
Paint Color Chart (If Applicable)  
Detailed Bolted Splices (If Applicable)  
Bolted Splice Location (If applicable)  
Signature and Seal of Professional Engineer,  
licensed in Accordance with Section 3.0

#### DESIGN CALCULATIONS

Data Required to be Shown:

Data Input for 3-D Analysis of Bridge  
Joint Coordinates & Member Incidences  
Joint and Member Loads  
Member Properties  
Load Combinations  
AISC Member Stress Checks for Each Member Type  
Critical Connection Failure Mode Checks For Each  
Member Type  
Chord Face Plastification Checks  
Punching Shear Checks  
Material Failure Checks (Truss Webs)  
Weld Failure Checks (Effective Length)

Weld Failure Checks (Ultimate)  
Local Buckling of the Main Member Face Checks  
Main Member Yielding Failure Checks  
Main Member Crippling Failure Checks  
Main Member Buckling Failure Checks  
Main Member Shear Failure Checks  
All Bolted Splice Checks (if applicable)  
Main Truss Deflection Checks  
Decking Material Checks  
"U-Frame" Stiffness Checks (if "Pony" Truss)  
Interior and End Portal Design Checks (if "Box" Truss)  
etermination of Top Chord K Factor Based on "U-Frame"  
Stiffness (if "Pony" Truss)  
Consideration of Individual Member Moments Due to  
truss Deflection, Joint Fixity and Joint Eccentricity

#### FABRICATION SUBMITTALS

Data Required to be Shown:

\*\* Written Installation Instructions  
\*\* Written Splicing Instructions  
\*\* Written Maintenance & Inspection Instructions  
\*\* Welder Certifications  
\*\* Welding Procedures  
Material Certifications (if applicable)  
Structural Steel (if applicable)  
Decking (if applicable)  
Structural Bolts (if applicable)  
\*\* Quality Control Section of AISC  
Certification Manual (if applicable)  
\*\* Painter Certifications (if applicable)  
Weld Testing Reports (if applicable)

\*\* NOTE: These items are required to be submitted  
along with Submittal Drawings and Design Calculations.  
Those Fabrication Submittal Items not marked are  
to be submitted prior to shipment of the bridge.

SECTION 055420  
FRAMES, GRATES, RINGS AND COVERS (S-57)

1. DESCRIPTION

This specification shall govern for the furnishing and installation of frames, grates, rings and covers for inlets, manholes and other structures in accordance with those details. Steel shall conform to the requirements of ASTM Designation: A 36.

2. MATERIALS

Welded steel grates and frames shall conform to the member size, dimensions and details shown on the plans and shall be welded into an assemble in accordance with those details. Steel shall conform to the requirements of ASTM Designation: A36.

Castings, whether Carbon-Steel, Gray Cast Iron or Ductile Iron shall conform to the shape and dimensions shown in the plans and shall be clean substantial castings, free from burnt-on sand and shall be reasonable smooth. Runners, risers, fins, and other cast-on pieces shall be removed from the castings and such areas ground smooth. Bearing surfaces between manhole rings and covers or grades and frames shall be cast or machined with such precision that uniform bearing shall be provided throughout the facilitate subsequent identification at installation.

Steel castings shall conform to the requirements of specifications for "Mild to Medium Strength Carbon Steel Castings for General Application", ASTM Designation: A 27. Grade 70-36 shall be furnished unless otherwise specified.

Cast Iron castings shall conform to the requirements of "Gray Iron Castings", ASTM Designation: A 48, Class 30.

Ductile iron castings shall conform to the requirements of "Ductile Iron Castings", ASTM Designation: A 536. Grade 60-40-18 shall be used otherwise specified.

3. CONSTRUCTION METHODS

Frames, grates, rings and covers shall be constructed of the materials as specified and in accordance with the details shown on the plans and shall be placed carefully to the lines or grades indicated on the plans or as directed by the Engineer.

All welding shall conform to the requirements of the applicable section of the latest American Welding Society Specifications. Frames, grates, rings and covers shall be given one coat of a commercial grade red lead and oil paint and two coats of commercial grade aluminum paint. Painting on gray iron castings will not be required, except when used in conjunction with structural steel shapes.

Commercial grade galvanized bolts and nuts shall be used. The zinc coating shall be uniform in thickness, smooth and continuous.

4. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, Frames, grates, rings and covers shall not be measured for payment.



SECTION 055440  
ALUMINUM GRATING (S-110)

1. DESCRIPTION

This specification shall govern all work necessary to provide and install all aluminum grating required for this project.

2. GENERAL REQUIREMENTS

After installation, the grating shall be capable of withstanding a uniformly distributed load of 200 PSF or a concentrated load of 600 pounds with a maximum deflection of  $\frac{1}{8}$  inch. Grating shall meet federal specification RR-G-661-C and standards set by OSHA of 1975.

Prior to installation, the Contractor shall submit four sets of detailed shop drawings for the Engineer's review and approval.

3. MATERIAL

Corrosion Resistance. All materials incorporated into the grating system shall be of an aluminum alloy which is corrosion resistant and recommended for use in an environment to include chlorine treated wastewater.

Walking surface. Walking surface shall have a non-skid surface.

Fasteners, Anchor Bolts and Supports. All fasteners, additional structural supports shall be provided by the manufacturer or in accordance with his recommendations.

4. CONSTRUCTION METHODS

All fabrication shall be done in a workmanlike manner, to provide a structurally sound product. All connections, supports, clips, etc. shall be properly aligned and installed.

5. MEASUREMENT AND PAYMENT

Unless indicated otherwise in Proposal, aluminum grating shall be measured by the square foot of aluminum grating installed. Measurement shall include but not be limited to furnishing and installing all grating, supports, clips and connections.

SECTION 057220  
ALUMINUM HANDRAILS (S-98)

1. SCOPE OF THE WORK: The work includes the furnishings of all labor, materials, equipment and services necessary and reasonable incidental for installing all aluminum handrails including all fittings and attachments required for the completion of the project.
2. MATERIALS: All handrails, posts, fittings, brackets, anchors, etc., required for the installation of all handrails shown on the drawings shall be fabricated of aluminum. The railing system has been designed around ReynoRail II Aluminum Pipe Railing System as supplied by the Architectural and Building Products Division of Reynolds Metals Company. The Connectorial System by Julius Blum and Company, Inc., or any other approved equal will be acceptable.
  - A. Rail, Posts and Formed Elbows: Shall be formed from extruded ReynoRail II 6063 or 6061 aluminum pipe of 1- $\square$  schedule 40 pipe size.
  - B. Other Components: All other aluminum parts shall be fabricated from 6063 or 6061 extruded aluminum. All fittings, except cast bases, shall be a one piece extrusion machined to final shape. Blind rivets and self-tapping screws shall be a furnished by Reynolds Metals Company. No fasteners other than 305 stainless steel shall be used with the ReynoRail II pipe railing system.
3. FINISH: All aluminum railing components shall be clear satin anodized finish on all exposed surfaces. All cast aluminum components shall be 0.4 mil anodized and all extruded components shall be 0.7 mil anodized. All pipe-shaped components shall have a light circumferentially-brushed finish before anodizing. All aluminum pipe and elbows shall be packed and shipped in individual plastic film to protect the anodized finish.
4. INSTALLATION: All handrails shall be installed as recommended by the manufacturer.
5. PROTECTION OF FINISH: The Contractor shall use all precautions necessary to protect the finish from scratches, nicks, gouges, dents, etc., during storage, assembly and installation. Insofar as possible, the plastic film shall be left intact on the pipe until inspection and acceptance by the Owner and/or Engineer.
6. WORKMANSHIP: All pipe cuts shall be square and accurate for minimum joint-gap. Cuts shall be clean and straight, free of "chanafer" from deburring, burrs and nicks. All holes shall be drilled and countersunk the proper size, as required for a tight flush fit of rivets.
7. SHOP DRAWINGS: Complete shop drawings of all handrail installations shall be submitted to the Engineer for approval before any fabrication is commenced. All fittings, connections, splices, anchors, brackets, etc., shall be shown.
8. MEASUREMENT AND PAYMENT: Unless indicated otherwise in the Proposal, Aluminum handrails shall subsidiary and not measured for pay.

SECTION 061810  
SHELTER CONSTRUCTION (S-102)

1. DESCRIPTION

This specification shall govern all work necessary for furnishing and constructing the shelter as required to complete the project.

2. MATERIALS

Reinforced Concrete: All concrete shall be Class A as described in Specification Section 030020. Rebar shall be Grade 40 as described in Specification Section 032020.

Laminated Beam: Laminated beams shall be of a size as indicated on the construction drawings. The beams shall be capable of supporting a 120 lb/linear foot dead load and a 240 lb/linear foot live load when connected as indicated in the construction drawings. Laminating lumber shall be kiln-dried southern pine, stress graded to meet the requirements of Standard Specifications for Structural Glued Laminated Timber AITC 117. The beams shall be manufactured in accordance with The American Institute of Timber construction Standards AITC 100, and Standard Specification of Structural Glue Laminated Timber, AITC 117. Adhesives shall be waterproof conforming to ASTM D2559-70. Quality control shall be provided in accordance with PS-56-73 Voluntary Products Standard for Structural Glued Laminated Timber and The American Institute of Timber Construction Manual, AITC 200. A certificate of conformance to these requirements shall be furnished and the AITC quality marks shall appear on all beams.

Decking: Shall be 2 x 6 or 2 x 8, nominal, single tongue and groove with V joint bottom. Lumber shall be #2 Grade of better kiln dried southern pine.

Facer & Drip Cap: Facer and drip cap shall be 1 inch (nominal) #1 Grade southern pine and shall be treated with PENTA or CCA to a minimum retention of .6 lbs. per cubic foot.

Roof: The roof shall consist of a minimum 235 lb. per square asphalt shingle with a U.L. rating of Class C or better. One layer of 15 lbs. per square felt conforming to ASTM D226 shall be placed under shingles.

Nails, Fasteners and Metal Connectors: All nails, fasteners, metal connectors and flashing shall be galvanized or corrosion resistant.

3. CONSTRUCTION METHODS

General: The Contractor shall provide all temporary bracers, supports, etc., as required during construction. The Contractor shall obtain all the necessary permits and pay all fees required for construction. Contractor shall meet requirements set forth in the southern building code as adopted by the City with amendments, unless indicated otherwise on the drawings.

Wood Treatment: All exposed ends of decking at overhangs, ends of beams, and ends of facers and drip cap shall be treated with a brushed-on PENTA wood preservative after ends are cut.

Reinforced Concrete: Concrete shall be placed in accordance with Section

038000. Concrete columns shall be allowed to cure a minimum of 3 days prior to placement in the foundation; and 7 days prior to connecting the timber beam. Placement of deck and roof shall not begin until the concrete column has cured for a minimum of 14 days. No heavy equipment shall be allowed on the concrete slab.

Laminated Beam: The laminated beams shall be protected by the Contractor. If temporary storage is required, the beams shall be blocked off ground and separated with spacers. Non-marring slings shall be used when handling. The holes for the column connection shall be made with the beam resting in place on top of column with treated wood spacers set.

Decking: Decking shall be placed with all joints at alternate beams as indicated in plans. The deck shall be secured to beam with 16d nails. 2 x 6 decking shall require 2 nails at each beam. 2 x 8 decking shall require 3 nails at beams without joint (or at center) and 2 nails at each end or at the joints.

Roof: Saturated felt shall be applied shingle fashion parallel to and starting from the eave and lapped six inches, fastened only as necessary to hold in place. Asphalt shingles shall be installed in accordance with manufacturer's requirements. Nails shall not extend through the bottom of decking.

Facer and Drip Cap: Facer, drip cap and flashing shall be placed around the structure. Flashing and nails for flashing shall be of like metals. Facer shall be secured to beams with three 8d nails at each beam.

#### 4. CERTIFICATION OF QUALITY

The Contractor shall provide the Engineer with the evidence of tests conducted which verify that the materials meet the requirements set forth under Section 061810.2.

#### 5. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the proposal, Shelter Construction shall be subsidiary and not measured for pay.

SECTION 066000  
FIBERGLASS V-NOTCHED WEIR PLATE (S-111)

1. DESCRIPTION

This specification shall govern all work required to fabricate and install all fiberglass V-notched weir plates required to complete the project.

2. MATERIALS AND FABRICATION

Plate shall be constructed for a 90° V-notched weir unless otherwise indicated on the drawings. Plate shall be of fiberglass reinforced polyester molded to a minimum thickness of 1/2" with matched die method to produce a uniform surface. Plate shall be resin rich, free of voids and unreinforced areas. The plate shall be provided with 2" diameter mounting holes spaced at 9" C-C. See contract drawings for plate dimensions.

Anchor Bolts shall be 1/2" x 4" stainless steel.

Washers shall be 5" in diameter and 1/2" thick fiberglass with a hole for a 1/2" bolt.

3. INSTALLATION

The weir plate shall be secured into position with 1/2" stainless steel anchor bolts and fiberglass washers. Bolts shall be set into concrete on 9" centers as shown in the drawings. The plate shall be fine adjusted for proper elevation and symmetry. The weir plate shall be caulked with non-hardening caulk.

4. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, Fiberglass V-Notched Weir Plates will not be measured and are considered subsidiary to the appropriate bid item.

SECTION 070020  
ASBESTOS REMOVAL (S-1)

SCOPE: This specification shall govern all work required for the removal and disposal of asbestos required to complete the project. See Lab Report in Appendix for asbestos that has been identified.

APPLICABLE DOCUMENTS AND SAFETY COMPLIANCE: The removal and disposal of asbestos shall be done in strict accordance with all Federal, State and Local requirements as applicable during the time of construction. Requirements to be observed include, but are not limited to, the following:

- a. Title 29, code of Federal Regulations, Sections 1910.1001, 1923.58 and 1910.1101 OSHA, U.S. Department of Labor.
- b. Title 40, Code of Federal Regulations, Part 61, Subpart M, National Emissions Standards for Hazardous Air Pollutants, EPA.
- c. Copies of the EPA Guidelines "Guidance for Controlling Asbestos Containing Materials in Buildings", June, 1985, shall be available at all times on the job site.

RESPONSIBILITY FOR DAMAGE CLAIMS:

The Contractor shall provide insurance in accordance with B-6-11 of the General Provisions of these contract documents. Said insurance shall be non-exclusive to asbestos.

QUALIFICATIONS OF CONTRACTOR:

All bidders shall submit a resume. The resume may include as much evidence as deemed necessary to establish qualifications for asbestos related work. The resume shall be submitted with this proposal. Non-submission of resume with proposal shall be considered grounds for rejection of bid.

DEFINITIONS:

Amended Water: Water containing a wetting agent or surfactant.

Asbestos: The term asbestos includes chrysotile, amosite, crocidolite, tremolite, anthophyllite, and actinolite.

Asbestos Control Area: An area where asbestos removal operations are performed which is isolated by physical boundaries to prevent the spread of asbestos dust, fibers or debris.

Asbestos Fibers: This expression refers to asbestos fibers having an aspect ratio of 3:1 and longer than 5 micrometers.

Ceiling Concentration: An exposure of airborne concentrations of asbestos fibers at any time in excess of 10 fibers, longer than 5 micrometers, per cubic centimeter of air.

Competent Person: One who is capable of identifying existing asbestos, tremolite, anthophyllite, of antinolite hazards in the workplace and who has the authority to take prompt corrective measures to eliminate them, as specified in 29 CFR 1926.32(f). The duties of the competent person include at least the following: establishing the negative-pressure enclosure, ensuring its integrity, and controlling entry to and exit from the enclosure; supervising any employee exposure monitoring required by the standard; ensuring that all employees working within such an enclosure wear the appropriate

personal protective equipment, are trained in the use of appropriate methods exposure control, and use the hygiene facilities and decontamination procedures specified in the standard; and ensuring that engineering controls in use are in proper operating condition and are functioning properly.

Area Monitoring: Sampling of asbestos fiber concentrations within the asbestos control area and outside the asbestos control area which is representative of the airborne concentrations of asbestos fibers which may reach the breathing zone.

Friable Asbestos Material: Material that contains more than one percent asbestos by weight and that can be crumbled, pulverized or reduced to powder by hand pressure when dry.

HEPA Filter Equipment: High efficiency particulate absolute filtered vacuuming equipment with a filter system capable of collecting and retaining asbestos fibers. Filters shall be of 99.97 percent efficiency for retaining fibers of 0.3 microns or larger.

Nonfriable Asbestos Material: Material that contains asbestos in which the fibers have been locked in by a bonding agent, coating, binder, or other material so that the asbestos is well bound and will not release fibers in excess of the asbestos control limit during any appropriate use, handling, demolition, storage, transportation, processing or disposal.

Personal Monitoring: Sampling of asbestos fiber concentrations within the breathing zone of an employee.

Time Weighted Average (TWA): Three samples are required to establish the 8-hour time weighted average. The TWA is an 8-hour time weighted average airborne concentration of fibers, longer than 5 micrometers, per cubic centimeter of air.

Asbestos Permissible Exposure Limit: 0.2 fibers (longer than 5 micrometers) per cubic centimeter as an 8-hour time weighted average.

TITLE TO MATERIALS: All materials resulting from demolition work, except as specified otherwise, shall become the property of the Contractor and shall be disposed of as specified herein.

MEDICAL REQUIREMENTS: 29 CFR 1910.1001.

Medical Examinations: Before exposure to airborne asbestos fibers, provide workers with a comprehensive medical examination as required by 29 CFR 1910.1001. This examination is not required if adequate records show the employee has been examined as required by 29 CFR 1910.1001 requirements with in the past year. The same medical examination shall be given on an annual basis to employees engaged in an occupation involving asbestos fibers and within 30 calendar days before of after the termination of employment in such occupation. Specifically identify x-ray films of asbestos workers to the consulting radiologist and mark medical record jackets with the word "ASBESTOS".

Medical Records: Maintain complete and accurate records of employees' medical examinations for a period of 40 years after termination of employment and make records of the required medical examinations available for inspection and copying to: The Assistant Secretary of Labor for Occupational Safety and Health, the Director of The National Institute for Occupational Safety and Health (NIOSH), authorized representatives of them, and an employee's physician upon the request of the employee or former employee.

RESPIRATOR PROGRAM: Establish a respirator program as required by ANSI Z88.2

AND 29 CFR 1910.134.

INDUSTRIAL HYGIENIST: Conduct monitoring and training under the direction of an industrial hygienist certified by the American Board of Industrial Hygiene.

POST BID SUBMITTALS: Prior to issuance of work order, the contractor shall provide the following submittals. These submittals shall be reviewed at the pre-construction conference and shall include the following:

Notification to Public Agencies: The contractor shall send written notice of the proposed asbestos related work to all applicable public agencies with a copy to the Engineer. The notice shall advise said agencies of the date of the pre-construction conference in addition to other relevant information. The pre-construction conference will be scheduled by the Construction Engineer (880-3058) of the City. Agencies to be notified include the following:

Environmental Protection Agency  
1201 Elm Street  
Dallas, TX 75270

Texas Air Pollution Control  
5602 Old Brownsville Road  
Corpus Christi, TX 78415

City-County Health Department  
1702 Horne Road  
Corpus Christi, TX 78416

Building Official  
City of Corpus Christi  
P.O. Box 9277  
Corpus Christi, TX 78469

Permits and Arrangements: The Contractor shall submit proof that all required permits, disposal sites, transport and other necessary arrangements for the hazardous waste have been procured.

Education of Workers: The Contractor shall submit documentation (certificates signed by each employee) indicating that each employee to be associated with the asbestos related work has had current instructions on the hazards of asbestos and that each demonstrated proficiency in all aspects of work procedures and protective measures.

Medical Records: The Contractor shall submit documentation that each employee has had a current physical examination including name, address, and phone number of the physician conducting said examination.

Certification of Equipment: The Contractor shall submit manufacturer's certification that vacuums, ventilation equipment and other equipment required to contain airborne asbestos fibers conform to ANSI Z9.2

Environmental Protection Plan: The Contractor shall submit a detailed plan of work procedures to be used in the removal and demolition of materials containing asbestos. The plan shall be prepared, signed and sealed, including certification number and date, by the certified industrial hygienist or consulting professional engineer. Such a plan shall include location of asbestos control areas, change rooms, layout of change room, inter face of trades, involved in the demolition, sequencing of asbestos related work, disposal plan, type of wetting agent and asbestos sealer to be used, air monitoring and a detailed description of



the method to be employed in order to control pollution and provide a safe work area. This plan shall be reviewed prior the start of any asbestos work.

Testing Laboratory: The Contractor shall submit the name, address and telephone number of the testing laboratory selected for the monitoring, testing, and reporting of airborne concentrations of asbestos fibers along with certification that persons counting the samples have been judged proficient by successful participation within the last year in the National Institute for Occupational Safety and Health (NIOSH) Proficiency Analytical Testing (PAT) Program.

Industrial Hygienist or Consulting Engineer: Submit the name, address and telephone number of the industrial hygienist selected to prepare asbestos plan, direct monitoring and training, and a certification that the Industrial Hygienist is certified by the American Board of Industrial Hygiene, or State Board of Registration for Professional Engineers, including certification number and date.

SUBMITTALS FOR ENVIRONMENTAL MONITORING:

Monitoring Results: Fiber counting shall be completed and results reviewed by the industrial hygienist within 16 hours. The industrial hygienist shall notify the Contractor and the Engineer immediately of any exposures to asbestos fibers in excess of the acceptable limits. Submit monitoring results to the Engineer within three working days, signed by the testing laboratory employee performing air monitoring, and employee that tested, and the certified industrial hygienist.

Monitoring of Nonfriable Materials: A copy of all monitoring reports of nonfriable asbestos, including a description of the work procedure at the time of air monitoring, shall be submitted to the Engineer prior to completion of the project.

Notification: Notify the Engineer three working days prior to the start of asbestos work.

Disposal Manifest: The Contractor shall submit written evidence that the landfill for disposal is approved for asbestos disposal by the ESEPA and state or local regulatory agency(s). Submit detailed delivery tickets, prepared, signed and dated by an agent of the landfill, certifying the amount of asbestos materials delivered to the landfill, within three working days after delivery.

Local Exhaust System: The local exhaust system shall be operated continuously 24 hours a day until the enclosure of the asbestos control area is removed. Pressure differential recording for each work day shall be reviewed by the industrial hygienist and submitted to the Engineer within 24 hours from the end of each work day. The industrial hygienist shall notify the Contractor and the Engineer immediately of any pressure differential which is less than .02 inches of water.

EXECUTION

Equipment: Make available to the Engineer two complete sets of personal protective equipment and instructions for their use as required herein for entry to the asbestos control area at all times for inspection of the asbestos control area.

Competent Person: The Contractor shall have a "Competent Person" on the job site during work.

Protective Clothing: Provide personnel exposed to airborne concentrations of asbestos fibers with fire retardant disposable protective whole body clothing, headcovering, gloves, and foot coverings. Provide disposable plastic or rubber gloves to protect hands. Cloth gloves may be worn inside the plastic or rubber gloves for comfort but shall not be used alone. Make sleeves secure at the wrists and make coverings secure at the ankles by the use of tape.

Caution Signs and Labels: Provide bilingual caution signs at all approaches to asbestos control areas containing concentrations of airborne asbestos fibers. Locate signs at such a distance that personnel may read the sign and take the necessary protective steps required before entering the area. Provide labels and affix to all asbestos materials, scrap, waste, debris and other products contaminated with asbestos.

Tools and Local Exhaust System: Provide a local exhaust system in the asbestos control area. The local exhaust system shall be in accordance with ANSI Z9.2 Equip exhaust with absolute (HEPA) filters. Local exhaust equipment must be sufficient to maintain a minimum pressure differential of minus 0.02 inch of water column relative to adjacent, unsealed areas. Provide continuous 24-hour per day monitoring of the pressure differential with an automatic recording instrument. In no case shall the building ventilation system be used as the local exhaust system for the asbestos control area. Filters on vacuum and exhaust equipment shall conform to ANSI Z9.2.

Work Procedures: Perform asbestos related work in accordance with 29 CFR 1910.1001 and as specified herein. Use wet removal procedures. Personnel shall wear and utilize protective clothing and equipment as specified herein. Eating, smoking and drinking shall not be permitted in the asbestos control area. Personnel of other trades not engaged in the removal and demolition of asbestos shall not be exposed at any time to airborne concentrations of asbestos unless all the personnel protection provisions of this specification are complied with by the trade personnel. Shut down the building, heating, ventilation and air conditioning systems. Disconnect electrical service when wet removal is performed and provide temporary electrical service.

Furnishings: Uncontaminated furnishings shall be removed prior to asbestos removal as applicable.

Asbestos Control Area Requirements: Seal openings in areas where the release of airborne asbestos fibers is expected. Establish an asbestos control area with the use of curtains, portable partitions, or other enclosures in order to prevent the escape of asbestos fibers from the contaminated asbestos control area.

Asbestos Handling Procedures: Sufficiently wet asbestos material with a fine spray of amended water during removal, cutting or other handling so as to reduce the emission of airborne fibers. Remove material and immediately place in plastic disposal bags. Where unusual circumstances prohibit the use of plastic bags, submit an alternate proposal for containment of asbestos fibers to the Engineer for approval. For example, in the case where both piping and insulation are to be removed, the Contractor may elect to wet the insulation and wrap the pipes and insulation in plastic and remove the pipe by sections.

Sealing and Removal of Asbestos-Contaminated Items: Remove contaminated architectural mechanical and electrical appurtenances such as venetian blinds, full-height partitions, carpeting, duct work, pipes and fittings, radiators, light fixtures, conduit, panels, and other contaminated for removal by completely coating the items with an asbestos sealer at the demolition site before removing the items from the asbestos control area. Remaining asbestos residue shall not be of such size so as to allow dislodging by means other than vacuuming. These items need not be vacuumed. The asbestos sealer shall be

tinted a contrasting color. It shall be spray-applied by airless method. Thoroughness of sealing operation shall be visually gauged by the extent of colored coating on exposed surfaces. Sealers shall be equal to the following products:

"Asbestite 2000" manufactured by Arpin Products, Inc., P.O. Box 262, Oak Hurst, NJ 07755, Phone (201)531-0674. (Application rate as recommended by manufacturer.)

"Wedbestos Sealer" distributed by Webco Products, Stinnes Western Chemical, 3270 East Washington Blvd., Los Angeles, CA 90023, Phone (213) 269-0191. (Application rate as recommended by manufacturer.)

"Dust-Set" Manufactured by Mateson Chemical Corporation, 1025 E. Montgomery Avenue, Phila., PA 19125, Phone (215)423-3200. (Application rate as recommended by manufacturer.)

Monitoring: Monitoring of airborne concentrations of asbestos fibers shall be in accordance with 29 CFR 1910.1001 and as specified herein.

Monitoring Prior to Asbestos Work: Provide area monitoring and establish the reference TWA one day prior to the masking and sealing operations for each demolition site.

Monitoring During Asbestos Work: Provide personal and area monitoring and establish the TWA during the first exposure to airborne concentrations of asbestos. Thereafter, provided the same type of work is being performed, provide area monitoring once every four hours during the work shift inside the asbestos control area, outside the entrance to the asbestos control area, and at the exhaust opening of the local exhaust system. If monitoring outside the asbestos control area shows airborne concentrations have reached the specified TWA, stop all work, correct the condition(s) causing the increase, and notify the Engineer immediately.

Site Inspection: While performing asbestos removal work, the Contractor shall be subject to onsite inspection by the Engineer who may be assisted by safety or health personnel. If the work is found to be in violation of this specification, the Engineer will issue a stop work order to be in effect immediately and until the violation is resolved. Standby time required to resolve the violation shall be at the Contractor's expense.

Clean-up and Disposal: Essential parts of asbestos dust control are housekeeping and clean-up procedures. Maintain surfaces of the asbestos control area free of accumulations of asbestos fibers. Give meticulous attention to restricting the spread of dust and debris; keep waste from being distributed over the general area. Do not blow down the space with compressed air. When asbestos removal is complete, all asbestos debris is removed from the worksite, the final clean-up is completed, certify the area as safe before the signs are removed. After final clean-up, remove all filters on the building HVAC system and provide new filters. Dispose of filters as asbestos-contaminated materials. Reestablish HVAC, mechanical, and electrical systems in proper working order. The Engineer will visually inspect the affected surfaces for residual asbestos material and accumulated dust and the Contractor shall re-clean all areas showing dust or residual asbestos materials. If re-cleaning is required, monitor the asbestos airborne concentration after re-cleaning. Notify the Engineer before unrestricted entry is permitted. The City shall have the option to perform monitoring to certify the areas are safe before entry is permitted.

Procedure for Disposal: Collect asbestos waste, scrap, debris, bags,

containers, equipment, and asbestos-contaminated clothing which may produce airborne concentrations of asbestos fibers and place in sealed impermeable bags. Affix a caution label to each bag. Dispose of waste asbestos material at an Environmental Protection Agency (EPA) or state-approved sanitary landfill. For temporary storage, store sealed impermeable bags in asbestos waste drums. Procedure for hauling and disposal shall comply with 40 CFR 61 (Subpart B), state, regional and local standards. Sealed plastic bags may be dumped from drums into the burial site unless the bags have been broken or damaged. Damaged bags shall remain in the drum and the entire contaminated drum shall be buried. Uncontaminated drums may be recycled. Workers unloading the sealed drums shall wear appropriate respirators and personal protective equipment when handling asbestos materials at the disposal site.

#### MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, Asbestos Removal shall not be measured for direct payment and will be subsidiary to the project.

SECTION 070120  
ROUGH AND FINISH CARPENTRY (S-120)

1. GENERAL

Scope: Furnish all labor, equipment, and materials to properly execute all rough and finish carpentry.

Delivery and Storage: Lumber delivered to the site shall be carefully piled off the ground in such a manner as to insure proper drainage, ventilation and protection from the weather.

2. MATERIALS

Grade marking: Each piece of framing and board lumber shall bear the official trademark and grademark of the manufacturer's association or the authorized inspection bureau under rules of which the lumber is manufactured, graded and purchased.

Sizes, patterns and moisture content: Lumber shall be surfaced four sides. Lumber to be incorporated in the structure shall conform to the moisture-content requirement of the latest official grading rules of nationally recognized associations representing the lumber industry. Lumber treated with water-borne preservatives shall be dried to a moisture content not exceeding 19 percent after treatment.

Plywood shall bear the mark of a recognized association of independent inspection agency that maintains continuing control over the quality of the plywood. The mark shall identify the plywood as to species, glue type and grade.

Species and grades of lumber for the various uses shall, at the option of the contractor, be any one of the species listed for the purpose of and of the grade specified for the species used.

Framing, bucks, sleepers, nailing strips and nailers:

Cypress; eastern hemlock; southern pine - No. 2  
Balsam fir; eastern white pine, Norway pine; eastern spruce - No. 1  
Cedar; coast region Douglas fir, inland Douglas fir, white fir, west coast hemlock; western larch; Idaho white pine, lodgepole pine, ponderosa pine - Standard.  
Redwood - sap common.

Nails and Bolts shall be galvanized.

3. EXECUTION

Framing shall be closely fitted, accurately set to required lines and levels and rigidly secured in place.

Nailing strips, unless otherwise shown, shall be continuous, cut with square ends in as long lengths as practicable, and rigidly secured in place.

Interior finish shall be machine sanded at the mill and sand-papered smooth at the building when installed. Interior trim shall be standard stock moldings and members conforming to the following requirements, and of approved design and type. Interior trim shall be run with hollow backs. Joints shall be made in approved manner to conceal shrinkage and shall be tight. Trim shall be secured with

fine finishing nails and with screws and glued as required. Nails shall be set for putty stopping. Wood finish shall be set straight, plumb or level, in perfect alignment, and shall be closely fitted. Moldings shall be mitered at exterior corners and coped at interior angles. Trim shall be drawn tight against finished surfaces.

SECTION 074320  
CEDAR SHINGLE ROOFING (S-4)

**1. DESCRIPTION**

This specification shall govern for all work necessary for furnishing and installing a cedar shingle roof on the project.

**2. MATERIALS**

Cedar shingles shall be Red Tagged Exterior Fire-X, Class B, as manufactured by American Wood Treater, Inc., or approved equal.

**3. CONSTRUCTION METHODS**

A. Roof Pitch and Exposures

On roof slopes of 4" rise in 12" horizontal run (pitch - 1/6) and steeper, the standard exposures shall be:

1. 5.0" for 16-inch shingles
2. 5.5" for 18-inch shingles
3. 7.5" for 24-inch shingles

On roof slopes of less than 4" rise in 12" horizontal run, the standard exposures shall be:

1. 4.0" for 16-inch shingles
2. 4.5" for 18-inch shingles
3. 6.0" for 24-inch shingles

B. Roof Application

Shingles shall be applied in straight, single courses and shall be tripled at all eaves. Butts of first-course shingles shall project 1" beyond the first sheathing board. Spacing between adjacent shingles (joints) shall be one-quarter inch. Joints in any one course shall be separated not less than 1" from joints in adjacent courses, and joints in alternate courses shall not be in direct alignment.

C. Underlayment

Underlayment shall be Type 30-lb. felt. When used with spaced sheathing, the horizontal felt overlap shall extend over a wood lath and the vertical joint must be lapped a minimum of 4 inches to insure proper waterproofing.

D. Valleys, Hips and Ridges

Roof valley flashing shall be No. 18 galvanized sheet gauge metal applied over an underlayment of Type 30-lb. felt. The metal shall extend a minimum of 10 inches from the centerline each way.

Hips and ridges shall be constructed of shingles that are uniform from 3" to 5" in width. Adjacent courses shall have alternate overlap. Shingles shall be placed on an underlayment of Type 30-lb. felt.

E. Nails

Each shingle shall be applied with two (only) hot-dipped zinc or aluminum nails. Each nail shall be placed not more than 3/4" from the side edge of the shingle and not more than 1" above the exposure line. Nails shall be 3d (1 1/4") for 16" and 18" shingles and 4d (1 1/2") for 24" shingles. In all cases, nails shall be long enough to penetrate at least 3/4" or through the sheathing. Drive nails flush, but not so that the head crushes the wood.

**4. WARRANTY**

Upon completion of the project, the Contractor shall supply a 20-year manufacturer's warranty for the cedar shingles. The project will not be accepted and final payment will not be made until the warranty is supplied. If warranty registration with the manufacturer is required, the Contractor shall make said registration on behalf of the City. Any signatures required on the registration shall be done by the Engineer or his authorized representative. The Contractor shall furnish proof, satisfactory to the Engineer, that the warranty is registered with the manufacturer.

**5. MEASUREMENT AND PAYMENT**

The cedar shingle roof shall be measured for payment at the unit specified in the proposal. This unit shall include all underlayment, sheet metal and other incidentals required to provide the complete roofing system in place. Payment at the unit specified shall be full compensation for furnishing all materials, tools, equipment, labor and incidentals necessary to complete the work.



SECTION 075220  
BUILT-UP ASPHALT ROOF SYSTEM (S-108)

1. DESCRIPTION

This specification shall govern all work for furnishing materials and constructing built-up asphalt roof required to complete the project.

2. MATERIALS

Materials: Obtain primary roofing materials from only one manufacturer, to the greatest extent possible. Secondary materials (and materials not available from the primary roofing materials manufacturer) shall be those built-up roofing materials recommended by the manufacturer of the primary materials. Materials shall comply with the following A.S.T.M. standards or shall be of equal or superior quality to the listed product:

Asphalt Primer - ASTM D-41  
Steep Asphalt - Type III or IV - ASTM D-312  
Polyurethane Foam Board Insulation - Johns-Manville - Fesco  
Foam Roof Insulation  
Perlitic Board Roof Insulation - ASTM C209/E84  
Asphalt Saturated Fiberglass Plies - ASTM D-2178 Type IV  
Wood Fiberboard Cant Strip - (cut from 1 1/2" thick wood  
fiberglass roof insulation) - ASTM C-208  
Plastic Cement -  
Inner Ply: Gulf States No. 304 Plastic Cement  
Outer Ply: J. M. Asbestile Flashing Cement  
Fibrated Aluminum Roof Coating - ASTM D-2824-69

3. MATERIAL STORAGE AND HANDLING

During storage and handling, insulation should be protected from the elements. It should be protected from moisture to prevent moisture absorption.

Roll roofing materials should be stacked vertically and protected from the elements. If the base ply is left exposed on the roof overnight, it is recommended that the laps be sealed either with hot asphalt or mastic, and any uncoated base sheet should be glaze coated with hot asphalt to temporarily seal the surface at the end of each day's work.

Care should be exercised in the handling and application of insulation to prevent cracking, breaking off or spalling of the edges.

4. CONSTRUCTION METHODS

- A. Preparation of Deck - Remove existing built-up roof system. Prior to the installation of any roofing materials, the deck surface must be clean, smooth, free from moisture, loose particles, grease, oil and other foreign matter. Solid prime the deck and necessary portions of parapet walls with asphalt primer and allow to dry completely. Contractor shall be held responsible for any damage to the inside of the building.
- B. Insulation - Perlitic tapered board roof insulation shall be applied to provide a slope of a minimum of 1/8 inch per foot of roof toward roof

edge. The contractor shall submit a plan showing the drainage pattern for approval prior to commencing work. The contractor is cautioned that there are a number of low areas on this roof to be corrected. Installation shall be as per manufacturer's recommendations. The foam board shall be laid in a solid mopping of hot asphalt applied at a rate of 25 lb. per square and heated in accordance with Equiviscous Temperature Standards. Equiviscous Temperature Range (E.V.T.) is the temperature range, plus or minus 25°F., at which a viscosity of 125 centistokes is attained. E.V.T. information can be obtained from the manufacturer.

The installation of the roofing system during two or more separate time intervals, or phase application, is not recommended. All plies of a given specification should be applied at one time.

Only install as much insulation as can be completely covered with roof membrane and exposed edges of insulation boards should be protected with water cut offs at the end of each working day. The water cut offs should be removed or cut before starting the next day's work.

When two or more layers of insulation are installed, the joints shall be staggered vertically and offset where possible. The edges of insulation board shall be straight and flush. End joints between adjacent boards should be staggered.

- C. Membrane: A solid mopping of asphalt shall be applied over insulation followed by four plies of asphalt saturated fiberglass meeting ASTM D-2178 Type IV. Each of the four plies of fiberglass shall be applied into a fluid, continuous application of asphalt. The plies should be lapped 27 1/2" leaving an exposure of 8 1/2". The asphalt shall be applied such that in no place will adjacent plies touch each other. All plies shall be broomed or squeegeed into place as they are applied. The asphalt shall be heated in accordance with E.V.T. standards and applied at a rate of 30 lbs. per square. A flood coat of asphalt applied at a rate of 20 lbs. per square shall be placed on the last layer of fiberglass followed by a coat of fibrated aluminum roof coating.

Felts should be laid in a straight line to assure adequate lap.

During the application of roofing materials, moisture should be prevented from becoming entrapped between the felts. If precipitation occurs prior to the completion of roof membrane application, all surfaces should be allowed to dry prior to resuming work.

Care should be taken to ensure a thin, continuous uniform interplay mopping of asphalt is applied within the E.V.T. temperature range to attain maximum adhesion of the plies.

## 5. ACCEPTANCE CRITERIA

All areas which fail drainage specification requirements with respect to slope, materials quality, etc., shall be repaired or replaced at the expense of the contractor. The maximum ponding area acceptable shall be 10 square feet and/or 1/4 inch deep.

## 6. GUARANTEE

The Contractor shall submit two copies of a five-year guarantee for the roofing and associated work, agreeing to repair or replace any work which leaks water, deteriorates excessively, or otherwise fails to perform as required due to failures of materials or workmanship. Guarantee shall be signed by the

Contractor.

At the end of the five-year period (two years from substantial completion), representatives of the Contractor and the City shall inspect the roof for any deficiencies due to wear and tear or faulty construction. All deficiencies shall be Contractor's at no expense to the City.

7. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the proposal, built-up asphalt roof shall not be measured for pay but shall be considered subsidiary to the project.

SECTION 078220  
CONCRETE TILE ROOFING (S-122)

1. PRODUCTS DELIVERY, STORAGE, AND HANDLING

Delivery:

- a. Clearly identify manufacturer, tradename, style and color of palletized material.
- b. Deliver materials in original containers with manufacturer's labels intact and legible.

Storage:

- a. Store cementitious materials in weather-tight spaces; keep free from moisture.
- b. Aggregate - Store in well drained area to minimize change in moisture content; prevent contamination by other materials.
- c. Protection - Cover stored materials with tarpaulin or other suitable covering to prevent soiling or exposure to weather. Fasten coverings to prevent removal by wind.

Handling: Do not stack tiles on roof in quantities exceeding six tiles high on 12 in. (300 mm) centers at every third course on slope.

2. SUBMITTALS

Samples: Submit 2 samples of full size standard tile.

Shop Drawings: Submit shop drawings detailing shop fabricated custom shapes.

3. JOB CONDITIONS

1. Do not set tiles in mortar when the ambient temperature is less than 40° F. (4.4° C) or when such temperature is expected within 24 hours.
2. Do not start setting tiles until other trades have completed work requiring traffic on or across roof surfaces.

4. GUARANTEE

Guarantee materials and workmanship to be free from defects and leaks for a period of 2 years from date of acceptance.

5. CONCRETE ROOFING TILES

1. Monray, Villa Field Type manufactured by Monier Rooftile (trade name).
2. Espana Mission Tile manufactured by Lifetile.
3. Color shall be selected from the manufacturer's standard color samples.
4. Fittings: Furnish all fittings as needed for complete installation in accordance with manufacturer's recommended and approved samples.

6. FELT UNDERLAYMENT

Coal-tar saturated roofing felt, ASTM D227, 30 lbs. x 36 width.

7. FASTENERS

Underlayment - Fasteners shall be specified for built-up roof.

Tile - Fasteners shall be as recommended by the tile manufacturer.

8. ROOF CEMENT AND SEALANT

Roof cement and sealant shall be as recommended by the tile manufacturer.

9. MORTAR

1. ASTM C270 - Type O.

2. Color to be selected to match tile color alkali and sun resistant mineral oxide.

10. METAL TRIM AND FLASHING

Metal trim and flashing to be as recommended by manufacturer.

11. WOOD NAILER STRIPS

Pine or Fir, Grade 2, Wolmanized. (Species)

12. LAYING ROOFING TILES

Layout and install tiles in accordance with manufacturer's specifications using closures trim at ridge, hip and coping manufactured for the purpose.

13. Cleaning

1. Remove any mortar or asphalt splatter from adjacent surfaces.

2. Upon completion of work, remove excess materials and broken tiles from the premises.

SECTION 097020  
EXPOSED AGGREGATE FINISH FOR CONCRETE SIDEWALKS (S-51)

1. DESCRIPTION

This specification shall consist of exposed aggregate finish, also called "Pea Gravel" or "Pebble Concrete," for sidewalks composed of Portland cement concrete, constructed as herein specified, in conformity with plans.

2. MATERIALS

Materials used shall be the same as specified in Section 025612, Concrete Sidewalks and Driveways". Exposed aggregate shall be from 1/2" minimum to 3/4" maximum in size free from flat pieces, cleaned prior to use.

3. CONSTRUCTION METHODS

Wet over which topping is to be poured, pour concrete, screed and darby. Aggregate to be exposed shall be evenly distributed by hand (approximately 4.25 lbs. per sq. ft.) so the entire surface is completely covered with a single layer (special care shall be taken in covering edges uniformly). Work aggregate into concrete with darby and as soon as surface will support the weight of the mechanic on knee-boards, hand float thoroughly so that all aggregate is completely embedded just below the surface with no holes or openings left in the surface, after which an approved retarder may be applied at the Contractor's option. At the proper time, aggregate shall be exposed by spraying the surface with a garden hose equipped with sprinkler attachment and brushing and flushing the water from the surface without overexposing or dislodging the aggregate. Care shall be exercised in moving over surface during spray and brushing to avoid breaking the aggregate bond.

When completed, the Contractor shall cure the slabs with a clear, non-staining curing compound. See Section 038000, "Concrete Structures" Section 14 for curing specifications.

Just prior to completion of the project, the slabs shall be thoroughly cleaned with water and light muratic acid solution, thoroughly rinsed and completely and evenly covered with "Sono Glaze" as manufactured by Sonneborn Building Products, Inc., or an approved equal glaze.

4. MEASUREMENT & PAYMENT

Unless indicated otherwise in the Proposal, Work and accepted material as prescribed for this specification will be measured by the square foot of surface area of completed. The work will be paid for at the unit bid price under the bid item "Exposed Aggregate" or [Curb Ramp], which price shall be full compensation for preparing the subgrade; for furnishing and placing all materials, including all reinforcing steel, and expansion joint materials; and all manipulation, labor, tools, equipment, and incidentals necessary to complete the work.

SECTION 099020  
PAINTING (S-56)

1. DESCRIPTION

This specification shall govern for all work necessary to provide all painting required to complete the project.

2. INTENT

All ferrous metal or unfinished material furnished on this project shall be furnished with a protective coating, but stainless steel, aluminum, bronze, copper, lead, and galvanized surfaces are not to be painted. Any factory painted item that is damaged or shows any sign of corrosion prior to the date of substantial completion shall be repainted by the Contractor. Concrete or concrete block is to be painted only when shown on the drawings to be painted.

COLORS

All colors shall be selected by the Engineer and/or Owner. The Contractor shall prepare samples of colors for approval by the Engineer and/or Owner.

SAMPLES

The Contractor shall submit for approval samples of paint materials proposed for use, in three displays of each kind of color of paint to be applied. The Contractor shall make panels used for displays, representative of respective types of surfaces to which several kinds and colors are to be applied in actual work. The Contractor shall not order paint materials until color selections have been made and samples approved.

3. PREPARATION OF SURFACES

3.1 General: All surfaces shall be clean when paint is applied.

3.2 Concrete and Masonry: The Contractor shall clean all concrete surfaces with mechanical abrasion (brushing) and water blast. The last step in the cleaning of surfaces other than sanitary sewer wet wells shall be to wash the surface to be painted with a 20% solution of muriatic acid and then rinse with potable water. In cleaning sanitary wet wells, all corroded concrete shall be removed as indicated above and the surface shall be washed with a solution of potable water and sodium hydroxide and then rinsed with potable water. The surface shall be thoroughly dry when paint is applied.

3.3 Metal:

- a. General: All metal surface to be painted shall be cleaned by sandblasting, except items that are shop coated. Cleaning shall be to "Near White Metal" SP-10 or NACE #2, or "Commercial Grade" SSPC-6 or NACE #3. One of these two methods will be specified where blast cleaning is required. NOTE: All submerged surfaces will require a "Near White Metal" (SP-10 or NACE #2 blast), without exception.
- b. "Near White Metal": Sandblast cleaning SP-10 or NACE #2. Definition and procedure as follows: "Near White Metal" is a method of preparing the metal surfaces for the application of

protective coatings by removing mill scale, rust, oil paint, and any foreign matter by propelling sand through a nozzle with compressed air. This is defined as a surface, gray white in appearance, being almost a completely uniform metallic color, with very light shadows allowed over less than 10% of the surface area.

Procedure:

- (1) Before blasting, grind smooth any rough welds and sharp edges.
- (2) Remove heavy deposits of oil and grease by detergent cleaning using one pound Sodium Meta Silicate per five gallons of water.
- (3) The sand used shall be 16-35 mesh, or 20-60 (unless otherwise specified) sharp angular grained silica sand that is fresh water washed, dried, properly graded and delivered to the job site in moisture proof bags (bulk sand of equal quality and size is acceptable). Sand shall not be re-used.
- (4) Compressed air shall be delivered at a minimum nozzle pressure of 90 p.s.i. not to exceed 110 p.s.i. This shall be free of detrimental amounts of condensed water and oil.
- (5) All blast products shall be swept or blown from the surface before priming commences.
- (6) Blast cleaning will not be conducted on surfaces that may become wet after blasting and before priming is complete, or when surfaces are less than 5° above dew point, or when relative humidity is above 85%.
- (7) The blasted surface shall be primed within 8 hours.

c. "Commercial" Blast Cleaning (SP-6 of NACE #3) Definition and Procedure: Commercial blast cleaning is a method of preparing metal surfaces for painting by removing mill scale, rust, rust scale, paint or foreign matter by the use of abrasive propelled through nozzles or by centrifugal wheels. Heavy deposits of grease or oils shall be removed by No. 1 "Solvent Cleaning" prior to blasting. "Commercial" blast cleaning entails the removal of practically all rust, mill scale and other detrimental matter from the surface. The surface will not necessarily be uniform in color, nor will all surfaces uniformly clean since the original condition of the surface will affect the final result. (If surface, prior to cleaning, is in such bad condition that the cleaning, when done according to this specification, results in a surface unsatisfactory to the Owner or suitable for very severe service, the No. 10 Blast Cleaning to "Near White Metal" shall be specified.) Less than 30% light shadow shall be visible.

Procedure:

- (1) Remove heavy deposits of grease or oil by detergent cleaning.
- (2) The sand shall be 20-40 mesh, unless otherwise specified, fresh water washed, dried, properly graded and delivered to the job site in vapor proof bags, or bulk. Sand shall not be re-used.
- (3) Compressed air shall be delivered at a minimum nozzle pressure of 90° p.s.i., not to exceed 100 p.s.i. This shall be free of condensed water and oil (use moisture traps).
- (4) Blow or sweep off the excess blast products from the surface.
- (5) Prime the blasted surface within 8 hours.
- (6) Blasting shall not be conducted when relative humidity is in



excess of 85% or surfaces are less than 5° above the dew point, unless approved by the Engineer.

- d. Removal of Oil and Grease: Remove oil and grease with approved solvents such as Naptha, or by steam combined with approved detergent. USE OF GASOLINE OR KEROSENE NOT PERMITTED.
- e. Scraping, Grinding and Chipping: Scrapers or other suitable grinding and chipping tools may be used for removal of existing paint coating prior to repainting, or for cleaning before application of secondary coats only when approved by the Engineer.
- f. Sandblasting: Clean such surfaces by "Near White" or "Commercial" sandblasting and leave clean, dry, and ready to receive prime coat. River sand must be graded and washed to insure removal of clayey material. Remove all dust and sand from surfaces before painting. Take care to remove all sand and grit around and between joints of connecting members. Schedule operations to avoid settling of dust or grit on freshly painted surfaces and adequately protect machinery or other equipment in vicinity of sandblasting work.

- 4. STORING AND MIXING OF PAINT: The Contractor shall use one convenient location for storing and mixing of paint materials, and keep an approved type fire extinguisher available in this area. The Contractor shall protect areas where paint is stored or painting is done and he shall remove all oily rags and waste from building at close of each day.

5. WEATHER AND SITE CONDITIONS:

5.1 Temperature: Painting shall not be accomplished when either the surface or ambient temperatures are less than 50° or when temperature drop of 20°F, or below 50° Fahrenheit, is forecast.

**NOTE:** Material shall be stored in area where the extreme cold or heat will not greatly affect viscosity. Coatings apply much better when product temperature is held within 60° - 90° F range (77° F is optimum).

5.2 Humidity: Painting shall not be accomplished during misty or rainy weather, or on surfaces that have any frost or moisture. Painting shall not be permitted at temperatures less than 5°F above the dew point.

5.3 Wind and Dust: Painting shall not be accomplished in dusty rooms or on the exterior during excessive wind. The Engineer shall be the sole judge as to what constitutes excessive wind.

6. APPLICATION PROCEDURES:

6.1 General: Paint shall be applied by skilled workmen. Paint may be applied with brush or spray equipment. Paint shall be applied in even and thorough coats, without runs, sags or other blemishes. Contractor shall properly sand paint surfaces between coats of enamel, paint or shellac when applied to any surface other than masonry. Apply paints in accordance with manufacturer's recommendations. Do not apply finish field painting to machinery,

equipment, or piping until operational testing has been completed.

6.2 Driving Time: Allow thorough drying time of each coat before succeeding coat is applied, except when manufacturer recommends otherwise, or as specified herein.

6.3 Coverage: Shall be as recommended by manufacturer.

6.4 Delivery of Paint: Contractor shall deliver paint to the site in original, unbroken, sealed containers, with manufacturer's label attached.

6.5 Thinners and Solvents: Contractor shall use only those thinners and solvents specified in paint formulas of paint being used and mix in proportions as recommended by paint manufacturer.

6.6 Brush Application: Contractor shall apply paint in uniform thickness consistent with specified coverage and with sufficient cross brushing to insure filling of surface irregularities. He shall exercise particular care in painting around rivet heads, bolt heads and nuts, in corners, restricted spaces, and on irregular concrete surfaces.

6.7 Spray Application: Contractor shall apply paint with adjustable air gun equipped with suitable water trap to remove moisture from compressed air, and with paint pot having hand or air driven agitator. Application of paint by suitable airless spray equipment is acceptable. Paint shall be applied with the width of spray not less than 6 inches nor more than 18 inches, and with suitable pressure for particular type of paint being used. Contractor shall make frequent checks to insure correct spreading rate and coating, and apply without sags, runs or "orange peel" effect. Correct all such imperfection. The Contractor shall take special care to cover edges, corners, and rivet head without bridging over of paint film.

6.8 Application of Protective Coating: When applying coats designed to prevent corrosion due to liquids and gases, the coating must be complete and absolutely free of the slightest pinhole, air pocket or other defect which would allow the entrance of either liquid or gas.

6.9 Painting Shop Coated Metal Surfaces:

- a. Prior to Installation: After delivery to site of work, and prior to installation, keep all shop coated metal work clean and free from corrosion. When directed, clean and re-touch damaged areas with additional primer.
- b. After Installation: After erection or installation of shop coated metal work, clean, and re-touch all rust spots, all places where paint has been rubbed or scraped off, and all field rivet boat head nuts. After previously applied paint has hardened, and when surfaces to receive succeeding coats of paint have been perfectly cleaned and dried, apply paint as set out elsewhere in these specifications. Allow interval of not less than 48 hours, or as recommended by manufacturer, between coats, and if surface is to be submerged in water, allow 5 days or more for hardening of final coat before placing in water.

- c. Machinery and Electrical Equipment: After installation of machinery and electrical equipment, check base coats carefully and retouch all damaged surfaces. Do not paint nameplates, serial number bases, chrome or bronze trim, or any rotating parts. Clean off any excess paint that impairs convenient removal of covers or gauges, instrumentation or other equipment fitted with doors or covers.
- d. Bolted and Imbedded Surfaces: All surfaces to be blotted together, to concrete or to be imbedded in concrete or grouted, to have prime and complete finish coats applied and dried before erecting in place.

6.10 CLEANING: Upon completion of painting operations, the Contractor shall clean off all paint spots, oil, and stain from all surfaces and leave entire project in perfect condition as far as painting work is concerned. Remove from premises all containers and debris resulting from painting operations.

7. PAINTING EQUIPMENT, MACHINERY AND METAL WORK

7.1 INTERIOR METAL DOORS, FRAMES, AND WINDOWS, AND OTHER MISCELLANEOUS ARCHITECTURAL METAL WORK:

Prime Coat: (Surface Prep - SP-6, or PT-4 "Hot Phosphate Treat")

- a. 1 coat - Briners #4805 Versatile Red Primer - Minimum 2.5 D.M.T.\*, or
- b. 1 coat - Koppers 654 Epoxy Primer - Minimum 2.5 D.M.T., or
- c. 1 coat - Pittsburgh Aquapon Red Inhibitive Primer #97-48/98 - Minimum 2.5 D.M.T., or
- d. an approved equal.

\*Dry Mils Thick

Intermediate Coat

- a. 1 coat - Briners #4800 Series Polyamide-Epoxy (Versatile) - Minimum 2 D.M.T., or
- b. 1 coat - Koppers Glamorglaze 200 Epoxy - Minimum 2 D.M.T., or
- c. 1 coat - Pittsburgh Aquapon Polyamide-Epoxy Finish- Minimum 2 D.M.T., or
- d. an approved equal.

Top Coat:

- a. 1 coat - Briners #4800 Series Polyamide-Epoxy (Versatile) - Minimum 2 D.M.T., or
- b. 1 coat - Koppers Glamorglaze 200 Epoxy - Minimum 2 D.M.T., or
- c. 1 coat - Pittsburgh Aquapon Polyamide Epoxy Finish - Minimum 2 D.M.T., or
- d. an approved equal.

7.2 EXTERIOR METAL DOORS, FRAMES, AND WINDOWS, AND OTHER MISCELLANEOUS ARCHITECTURAL METAL WORK:

Prime Coat: (Surface Prep-SP-6)

- a. 1 coat - Briners #4805 Versatile Red Primer - Minimum 2.5 D.M.T., or
- b. 1 coat - Koppers 654 Epoxy Primer - Minimum 2.5 D.M.T., or
- c. 1 coat - Pittsburgh Aquapon Red Inhibitive Primer #97-48/98- - Minimum 2.5 D.M.T., or
- d. an approved equal.

Intermediate Coat:

- a. 1 coat - Briners #4817 Versatile Tan Primer - Minimum 2.5 D.M.T., or
- b. 1 coat - Koppers Glamorglaze 200 Epoxy - Minimum 2.5 D.M.T. or
- c. 1 coat - Pittsburgh Aquapon Polyamide Epoxy Finish - Minimum 2.5 D.M.T., or
- d. an approved equal.

Top Coat:

- a. 1 coat - Briners ACRA-CLAD (Acrylic Urethane) - Minimum 2.5 D.M.T., or
- b. 1 coat - Koppers Polyurethane - Minimum 2.5 D.M.T., or
- c. 1 coat - Pittsburgh Pitthane (Polyurethane) - Minimum 2.5 D.M.T. or
- d. an approved equal.

- 7.3 INTERIOR-STRUCTURAL STEEL, HANDRAILS, WALKWAYS, AND OTHER MISCELLANEOUS METAL WORK: (Sandblast "Near-White Metal", SP-10 or NACE #2)

Prime Coat:

- a. 1 coat - Briners #4805 Versatile Red Primer - Minimum 3 D.M.T., or
- b. 1 coat - Koppers #654 Epoxy Primer - Minimum 2.5 D.M.T., or
- c. 1 coat - Pittsburgh Aquapon Red Primer #97-48/49 - Minimum 2.5 D.M.T., or
- d. an approved equal.

Intermediate Coat:

- a. 1 coat - Briners #4817 Versatile Tan Primer - Minimum 3. D.M.T., or
- b. 1 coat - Koppers 200 H.B. Epoxy - Minimum 3 D.M.T., or
- c. 1 coat - Pittsburgh Light Gray Aquapon #97-3/98, Minimum 3 D.M.T., or
- d. an approved equal.

Top Coat:

- a. 1 coat - Briners #4800 Series Versatile Polyamide Epoxy Finish - Minimum 2.5 D.M.T., or
- b. 1 coat - Koppers Glamorglaze 200 Epoxy - Minimum 3 D.M.T. or
- c. 1 coat - Pittsburgh Aquapon Polyamide Epoxy Finish #97-51/51 - Minimum 3 D.M.T., or
- d. an approved equal.

7.4 EXTERIOR-STRUCTURAL STEEL, HANDRAILS, WALKWAYS, AND OTHER MISCELLANEOUS METAL WORK: (Sandblast "Near White Metal", SP-10 or NACE #2)

Prime Coat:

- a. 1 coat - Briners #4805 Versatile Red Primer - Minimum 3 D.M.T., or
- b. 1 coat - Koppers #654 Epoxy Primer - 2.5 D.M.T., or
- c. 1 coat - Pittsburgh Aquapon Red Inhibitive Primer #97-48/98 - Minimum 2.5 D.M.T., or
- d. an approved equal.

Intermediate Coat:

- a. 1 coat - Briners #4817 Versatile Tan Primer - Minimum 3 D.M.T., or
- b. 1 coat - Koppers 200 H.B. Epoxy - Minimum 3 D.M.T., or
- c. 1 coat - Pittsburgh Light Gray Aquapon #97-3/98 - Minimum 3 D.M.T., or
- d. an approved equal.

Top Coat:

- a. 1 coat - Briners ACRA-CLAD (Acrylic Urethane) - Minimum 2.5 D.M.T., or
- b. 1 coat - Koppers Polyurethane - Minimum 2.5 D.M.T., or
- c. 1 coat - Pittsburgh Pitthane (Polyurethane) - Minimum 2.5 D.M.T., or
- d. an approved equal.

7.5 STRUCTURAL STEEL AND OTHER MISCELLANEOUS METAL SUBMERGED IN WASTEWATER: (Sandblast "Near White Metal", SP-10 NACE #2)

Prime Coat:

- a. 1 coat - Briners U#4817 Versatile Tan Primer - Minimum 2.5 D.M.T., or
- b. 1 coat - Koppers 654 Epoxy, Minimum 2.5 D.M.T., or
- c. 1 coat - Pittsburgh Aquapon Green Inhibitive Primer - #97-49/98 - Minimum 2.5 D.M.T., or
- d. an approved equal.

Intermediate Coat: (Shall be applied in not less than four (4) hours and not more than fifteen (15) hours after applying the previous coat.)

- a. 1 coat - Briners #791 Coal Tar Epoxy - Minimum 8 D.M.T., or
- b. 1 coat - Koppers Bitumastic 300-M Coal Tar Epoxy - Minimum 8 D.M.T., or
- c. 1 coat - Pittsburgh Coal Tar Epoxy - Coal Cat #97-640/641 Epoxy-Minimum 8 D.M.T., or
- d. an approved equal.

Top Coat: (Shall be applied in not less than four (4) hours and not more than fifteen (15) hours after applying the previous coat.)

- a. 1 coat - Briners #791 Coal Tar Epoxy - Minimum 8 D.M.T., or
- b. 1 coat - Koppers 300-M Coal Tar Epoxy - Minimum 8 D.M.T., or
- c. 1 coat - Pittsburgh Coal Tar Epoxy - Coal Cat #97-640/641

- d. Epoxy-Minimum 8 D.M.T., or  
an approved equal.

7.6 STRUCTURAL STEEL AND OTHER MISCELLANEOUS METAL SUBMERGED IN POTABLE WATER: (Sandblast "Near White Metal", SP-1 or NACE #2)

Prime Coat:

- a. 1 coat - Briners #796 Non-Toxic Primer, 2 - 2.5 D.M.T., or  
b. 1 coat - Koppers #294 Epoxy Primer - Minimum 3 D.M.T., or  
c. Pittsburgh (No system available), or  
d. 1 coat - Tnemec 20-1255 "Beige" Pota-Pox Primer - Minimum 3 D.M.T., or  
e. an approved equal.

Intermediate Coat: (Shall be applied in not less than four (4) hours and not more than fifteen (15) hours after applying the previous coat.)

- a. 1 coat - Briners #797 Super Versatile Non-Toxic White - Minimum 5 D.M.T., or  
b. 1 coat - Koppers 200 H.B. Epoxy - Minimum 6 D.M.T., or  
c. Pittsburgh (No system available), or  
d. 1 coat - Tnemec 20-2000 "White" Pota-Pox - Minimum 4 D.M.T., or  
e. an approved equal.

Top Coat: (Shall be applied in not less than (4) hours and not more than fifteen (15) hours after applying the previous coat.)

- a. 1 coat - Briners #797 Super Versatile Non-Toxic White - Minimum 5 D.M.T., or  
b. 1 coat - Koppers 200 H.B. Epoxy - Minimum 6 D.M.T., or  
c. Pittsburgh (No system available), or  
d. 1 coat - Tnemec 20-2000 "White" Pota-Pox - Minimum 4 D.M.T., or  
e. an approved equal.

7.7 INTERIOR - SHOP PAINTED PUMPS, MACHINERY AND MOTORS:

Prime Coat:

- a. 1 coat - Briners #2810 Durapon Red Primer - Minimum 2 D.M.T., or  
b. 1 coat - Koppers 621 Rust Inhibitive Primer - Minimum 2 D.M.T., or  
c. 1 coat - Pittsburgh Multi-Prime #97-684 Minimum 2 D.M.T., or  
d. 1 coat - Tnemec Series 37K-77 Chem-Prime-Minimum 2 D.M.T., or  
e. an approved equal.

Intermediate Coat:

- a. 1 coat - Briners #2800 Series Durapon Enamel Epoxy - Minimum 2 D.M.T., or  
b. 1 coat - Koppers Ponkote 300 Enamel - Minimum 2 D.M.T., or  
c. 1 coat - Pittsburgh Aquapon Polyamide Epoxy finish - Minimum 2 D.M.T., or  
d. 1 coat - Tnemec Series 2H Hi-Build Tnemec-Glass - Minimum 2

- D.M.T., or
- e. an approved equal.

Top Coat:

- a. 1 coat - Briners #2800 Series Durapon Enamel Epoxy - Minimum 2 D.M.T., or
- b. 1 coat - Koppers Ponkote 300 Enamel - Minimum 2 D.M.T., or
- c. 1 coat - Pittsburgh Aquapon Polyamide Epoxy Finish - Minimum 2 D.M.T., or
- d. 1 coat - Tnemec Series 2H Hi-Build Tnemec-Glass - Minimum 2 D.M.T., or
- e. an approved equal.

7.8 EXTERIOR - SHOP PAINTED PUMPS, MACHINERY, AND MOTORS:

Prime Coat:

- a. 1 coat - Briners #4805 Versatile Red Prime - 2.5 - 3 D.M.T., or
- b. 1 coat - Koppers 654 Epoxy Primer 2.5 - 3 D.M.T., or
- c. 1 coat - Pittsburgh Aquapon Red Inhibitive Primer #97-48/98 2.5 - 3 D.M.T., or
- d. an approved equal.

Intermediate Coat:

- a. 1 coat - Briners #4817 Versatile Tan Primer - Minimum 3 D.M.T., or
- b. 1 coat - Koppers Glamorglaze 200 Epoxy - Minimum 3 D.M.T., or
- c. 1 coat - Pittsburgh Polyamide Epoxy Gray High Solids #97-151/159 - Minimum 5 D.M.T., or
- d. an approved equal.

Top Coat:

- a. 1 coat - Briners ACRA-CLAD (Acrylic Urethane) - Minimum 2.5 D.M.T., or
- b. 1 coat - Koppers Polyurethane - Minimum 2.5 D.M.T., or
- c. 1 coat - Pittsburgh Pitthane (Polyurethane) - Minimum 2.5 D.M.T., or
- d. an approved equal.

7.9 ELECTRICAL CONTROL EQUIPMENT:

Prime Coat:

- a. 1 coat - Briners #2810 Durapon Red Primer - Minimum 2.5 D.M.T., or
- b. 1 coat - Koppers 621 Rust-Inhibitive Primer - Minimum 2.5 D.M.T., or
- c. 1 coat - Pittsburgh Aquapon Red Inhibitive Primer #97-48/98 - Minimum 2.5 D.M.T., or
- d. 1 coat - Tnemec Series 37-77 Chem-Prime - Minimum 2 D.M.T., or
- e. an approved equal.

Intermediate Coat:

- a. 1 coat - Briners #2816 Durapon Intermediate Primer (Epoxy) - Minimum 2 D.M.T., or
- b. 1 coat - Koppers 300 Enamel - Minimum 2 D.M.T., or
- c. 1 coat - Pittsburgh Aquapon Polyamide Epoxy Finish - Minimum 2 D.M.T., or
- d. an approved equal.

Top coat:

- a. 1 coat - Briners #2800 Series Durapon Enamel Epoxy - Minimum 2 D.M.T., or
- b. 1 coat - Koppers 300 Enamel - Minimum 2 D.M.T., or
- c. 1 coat - Pittsburgh Aquapon Polyamide Epoxy Finish - Minimum 2 D.M.T., or
- d. 1 coat - Tnemec Series 2H High-Build - Minimum 2 D.M.T., or
- e. an approved equal.

8. PAINTING EXPOSED AND SUBMERGED METAL PIPING

8.1 EXPOSED VALVES, FITTINGS, AND PIPES: (Sandblast "Commercial Grade" SP-6 or NACE #3)

Prime Coat:

- a. 1 coat - Briners #4805 Versatuke Red Primer - Minimum 3 D.M.T., or
- b. 1 coat - Koppers 654 Primer - Minimum 2.5 D.M.T., or
- c. 1 coat - Pittsburgh Aquapon Red Inhibitive Primer #97-48/98 - Minimum 2.5 D.M.T., or
- d. an approved equal.

Intermediate Coat:

- a. 1 coat - Briners #4817 Versatile Tan Primer - Minimum 3 D.M.T., or
- b. 1 coat - Koppers H.B. Epoxy - Minimum 6 D.M.T., or
- c. 1 coat - Pittsburgh Polyamide Epoxy Gray High Solids #97/151/159 - Minimum 5 D.M.T., or
- d. an approved equal.

Top Coat:

- a. 1 coat - Briners ACRA-CLAD (Acrylic Urethane) - Minimum 2.5 D.M.T., or
- b. 1 coat - Koppers Polyurethane - Minimum 2.5 D.M.T., or
- c. 1 coat - Pittsburgh Pitthane (Polyurethane) - Minimum 2.5 D.M.T., or
- d. an approved equal.

Color Coding: Piping shall be color coded as shown on the drawings. When coding is not shown on the drawings, the following shall apply:

Sludge Line	Brown
Gas Line	Red
Potable Water Line	Blue
Non-Potable	White-stenciled "Unsafe Water"
Chlorine Line	Yellow
Sewage Line	Gray





Top Coat: (Should be applied within 48 hours of Intermediate (Coat))

- a. 1 coat - Briners #797 Super Versatile Non-Toxic White - Minimum 4 D.M.T., or
- b. 1 coat - Koppers 200 HP Epoxy - Minimum 6 D.M.T., or
- c. Pittsburgh (No system available), or
- d. 1 coat - Tnemec 20-2000 "White" Pota-Pox - Minimum 4 D.M.T., or
- e. an approved equal.

## 9. PAINTING CONCRETE AND MASONRY

### 9.1 INTERIOR OF CONCRETE WASTEWATER WET WELLS:

Prime Coat: (Applied at the rate recommended by manufacturer)

- a. 1 coat - Briners #791 Coal Tar Epoxy - Minimum 8 D.M.T., or
- b. 1 coat - Koppers Bitumastic 300-M - Minimum 8 D.M.T., or
- c. 1 coat - Pittsburgh Coal Tar Epoxy - Coal Cat #97-640/641 Epoxy - Minimum 8 D.M.T., or
- d. Tnemec - No Prime Coat Required, or
- e. an approved equal.

Top Coat: (Shall be applied in not less than four (4) hours and not more than fifteen (15) hours after applying the previous coat).

- a. 1 coat - Briners #791 Coal Tar Epoxy - Minimum 10 D.M.T., or
- b. 1 coat - Koppers Bitumastic 300-M - Minimum 10 D.M.T., or
- c. 1 coat - Pittsburgh Coal Tar Epoxy - Coal Cat #97-640/641 Epoxy - Minimum 10 D.M.T., or
- d. 1 coat Tnemec 46H413 Hi-Build Tnemec-Tar - Minimum 18 D.M.T., or
- e. an approved equal.

The interior epoxy coating of concrete wastewater wet wells must be absolutely free of the slightest pinhole, air pocket, and other imperfections which allow entry of corrosive gasses. The Contractor shall provide all equipment, labor, and materials for testing and repair of pinholes and imperfections. Holiday detection shall be done with a D.E. Stearns Model 14/20 holiday detector.

### 9.2 INTERIOR - CONCRETE AND CONCRETE BLOCK:

Prime Coat: (Applied as necessary to fill surface to the satisfaction of the Engineer)

- a. 1 coat - Briners #4849 Block Sealer, or
- b. 1 coat - Koppers Block Sealer, or
- c. 1 coat - Pittsburgh Polyamide Epoxy Filler #97-685/686, or
- d. 1 coat - Tnemec 54-562 Modified Epoxy Masonry Filler, or
- e. an approved equal.

Intermediate Coat:

- a. 1 coat - Briners #4800 Series Versatile Polyamide Epoxy - Minimum 2 D.M.T., or
- b. 1 coat - Koppers Glamorglaze 200 Epoxy - Minimum 2 D.M.T., or
- c. 1 coat - Pittsburgh Pitt-Glaze Hi Solids Epoxy - Minimum 2 D.M.T., or
- d. 1 coat - Tnemec Series 66 Hi-Build Epoxoline - Minimum 2

- e. D.M.T., or  
an approved equal.

Top Coat:

- a. 1 coat - Briners #4800 Series Versatile Polyamide Epoxy - Minimum 2 D.M.T., or
- b. 1 coat - Koppers Glamorglaze 200 Epoxy - Minimum 2 D.M.T., or
- c. 1 coat - Pittsburgh Pitt-Glaze Hi Solids Epoxy - Minimum 2 D.M.T., or
- d. 1 coat - Tnemec Series 66 Hi-Build Epoxoline - Minimum 2 D.M.T., or
- e. an approved equal.

9.3 EXTERIOR - CONCRETE AND CONCRETE BLOCK:

Prime Coat: (Applied as necessary to fill surface to the satisfaction of the Engineer.)

- a. 1 coat - Briners #4849 Block Sealer, or
- b. 1 coat - Koppers Block Sealer, or
- c. 1 coat - Pittsburgh Polyamide Epoxy Block Filler #97-685/686, or
- d. 1 coat - Tnemec Series 54-562 Modified Epoxy Masonry Filler, or
- e. an approved equal.

Intermediate Coat:

- a. 1 coat - Briners #4800 Series Versatile Polyamide Epoxy - Minimum 2 D.M.T., or
- b. 1 coat - Koppers Glamorglaze 200 Epoxy - Minimum 2 D.M.T., or
- c. 1 coat - Pittsburgh Aquapon Polyamide Epoxy Finish - Minimum 2 D.M.T., or
- d. 1 coat - Tnemec Series 66 Hi-Build Epoxoline - Minimum 2 D.M.T., or
- e. an approved equal.

Top Coat:

- a. 1 coat - Briners #4800 Series Versatile Polyamide Epoxy - Minimum 3 D.M.T., or
- b. 1 coat - Kopper Glamorglaze 200 Epoxy - Minimum 3 D.M.T., or
- c. 1 coat - Pittsburgh Aquapon Polyamide Epoxy Finish - Minimum 3 D.M.T., or
- d. 1 coat - Tnemec Series 66 Hi-Build Epoxoline - Minimum 2 D.M.T., or
- e. an approved equal.

10. PAINT WOOD SURFACES

10.1 INTERIOR WOODWORK:

Prime Coat:

- a. 1 coat - Briners #1600 Enamel Undercoater - Minimum 2 D.M.T., or
- b. 1 coat - Koppers 625 Undercoater - Minimum 2 D.M.T., or
- c. 1 coat - Pittsburgh Enamel Undercoat 6-6 - Minimum 2 D.M.T., or

- d. 1 coat - Tnemec Series 36-603 Undercoater - Minimum 2 D.M.T.,  
or
- e. an approved equal.

Intermediate Coat:

- a. 1 coat - Briners Duranemal - Minimum 2 D.M.T., or
- b. 1 coat - Koppers Ponkote 300 Enamel - Minimum 2 D.M.T., or
- c. 1 coat - Pittsburgh Speedhide 6-252 Series Enamel - Minimum 2  
D.M.T., or
- d. 1 coat - Tnemec Series 2H Hi-Build - Minimum 2 D.M.T., or
- e. an approved equal.

Top Coat

- a. 1 coat - Briners Duranemal - Minimum 2 D.M.T., or
- b. 1 coat - Koppers Ponkote 300 Enamel - Minimum 2 D.M.T., or
- c. 1 coat - Pittsburgh Speedhigh 6-252 Series Enamel - Minimum 2  
D.M.T., or
- d. 2 coats - Tnemec Series 2 H Hi-Build - Minimum 2 D.M.T., or
- e. an approved equal.

10.2 EXTERIOR WOODWORK:

Prime Coat:

- a. 1 coat - Briners Exterior Wood Primer - Minimum 2 D.M.T., or
- b. 1 coat Koppers 625 Undercoater - Minimum 2 D.M.T., or
- c. 1 coat - Pittsburgh Speedhide 6-809 Exterior Wood Primer  
(Mildew Resistant) - Minimum 2 D.M.T., or
- d. 1 coat - Tnemec Series 36-603 Undercoater - Minimum 2 D.M.T.,  
or
- e. an approved equal.

Intermediate Coat:

- a. 1 coat - Briners Acraflex - Minimum 2 D.M.T., or
- b. 1 coat - Koppers Rustarmor - Minimum 2 D.M.T., or
- c. 1 coat - Pittsburgh Speedhide 6-800 Series or Speedhike 1-900  
Series (Mildew Resistant) - Minimum 2 D.M.T., or
- d. 1 coat - Tnemec Series 23 Enduratone - Minimum 2 D.M.T., or
- e. an approved equal.

Top Coat

- a. 1 coat - Briners Acraflex - Minimum 2 D.M.T., or
- b. 1 coat - Koppers Rustarmor - Minimum 2 D.M.t., or
- c. 1 coat - Pittsburgh Speedhike 6-800 Series or Speedhike N-900  
Series (Mildew Resistant) - Minimum 2 D.M.T., or
- d. 2 coats - Tnemec Series 23 Enduratone - Minimum 2 D.M.T., or
- e. an approved equal.

11. PAINTING GYPSUM BOARD

11.1 GENERAL INTERIOR - GYPSUM BOARD

Prime Coat:

- a. 1 coat - Briners #3400 Acra-Kote - Minimum 2 D.M.T., or
- b. 1 coat - Koppers 600 Acrylic Emulsion - Minimum 2 D.M.T., or

- c. 1 coat - Pittsburgh Speedhike 6-2 Latex Sealer - Minimum 2 D.M.T., or
- d. 1 coat - Tnemec 51-792 PVA Sealer - Minimum 2 D.M.T., or
- e. an approved equal.

Top Coat:

- a. 1 coat - Briners #3400 Acra-Kote - Minimum 2 D.M.T., or
- b. 1 coat - Koppers 600 Acrylic Emulsion - Minimum 2 D.M.T., or
- c. 1 coat - Pittsburgh Speedhike 6-2 Latex Sealer - Minimum 2 D.M.T., or
- d. 1 coat - Tnemec Series 6 Tnemec Cryl - Minimum 2 D.M.T., or
- e. an approved equal.

11.2 WASHROOM, SHOWER ROOM, LOCKER ROOM INTERIOR GYPSUM BOARD:

Prime Coat:

- a. 1 coat - Briners #4800 Series Versatile Polyamide Epoxy - Minimum 2 D.M.T., or
- b. 1 coat - Koppers Glamorglaze Wallboard Primer - Minimum 2 D.M.T., or
- c. 1 coat - Pittsburgh Multiprime 97-684 - Minimum 2 D.M.T., or
- d. 1 coat - Tnemec Series 51-792 PVA Sealer - Minimum 21 D.M.T., or
- e. an approved equal.

Intermediate Coat:

- a. 1 coat - Briners #4800 Series Versatile Polyamide Epoxy - Minimum 2 D.M.T., or
- b. 1 coat - Koppers Glamorglaze 200 Epoxy - Minimum 2 D.M.T., or
- c. 1 coat - Pittsburgh Aquapon #97-3/98 - Minimum 2 D.M.T., or
- d. 1 coat - Tnemec Series 66 Hi-Build - Minimum 2 D.M.T., or
- e. an approved equal.

Top Coat:

- a. 1 coat - Briners #4800 Series Versatile Polyamide Epoxy - Minimum 2 D.M.T., or
- b. 1 coat - Koppers Glamorglaze 200 Epoxy - Minimum 2 D.M.T., or
- c. 1 coat - Pittsburgh Aquapon 97-51/51 - Minimum 2 D.M.T., or
- d. 1 coat - Tnemec Series 66 Hi-Build - Minimum 2 D.M.T., or
- e. an approved equal.

12. RESPONSIBILITY FOR PAINT SYSTEMS

12.1 The intent of this specification is to provide the Contractor with several manufacturers' paint systems on which to base his bid. The Contractor is responsible for verifying with the paint manufacturer before he purchases any material, that the paint system is suitable for use on this project and that application rates, etc., are in compliance with the manufacturer's recommendations.

13. Measurement and Payment

Painting shall not be measured for pay and shall be subsidiary to other work.

SECTION 113100  
FIBERGLASS REINFORCED PLASTIC WETWELL (S-64)

1. DESCRIPTION

This specification shall govern all work necessary for the furnishing of all plant, labor, equipment, supplies, and materials and for performing all operations required to complete the wetwell. The Fiberglass Reinforced Plastic wetwell shall be a one-piece unit of one class, fabricated in a composite laminate to conform to the requirements as set forth in this specification.

2. GENERAL

- A. Dimensions: The wetwell shall be a ribbed, circular cylinder of minimum internal diameter as shown in the plans.
- (1) Wall component elements: isophthalic polyester resin, fiberglass chopped strand & continuous reinforcements.
- (2) Rib component elements: isophthalic polyester resin, Fiberglass chopped strand and woven roving reinforcements.
- B. Class: The wetwell shall be manufactured in one class of load rating. This class shall be H-20 wheel load (16,000 pounds dynamic wheel load).
- C. Governing Standards: Plastic laminate must meet the conditions of ASTM C582, and the chemical resistance test ASTM C581. Previous tests are acceptable provided laminates are representative.

3. MATERIALS:

- A. Resin: Unsaturated isophthalic polyester resins shall be used and they must meet the requirements listed below.

<u>Property</u>	<u>Test Method</u>	<u>Requirements</u>
1. Acid Number	ASTM D 465-59	Maximum = 15
2. Hydroxyl Number		Maximum = 30
3. Solids Content	ASTM D1259-61	Maximum = 50%

The following requirements are determined when testing the resin without any reinforcing material included.

<u>Property</u>	<u>Test Method</u>	<u>Requirements</u>
4. Flexural Strength	ASTM D 790-70	Min. 10,000 psi
5. Flexural E-modulus	ASTM D 790-70	Min. 400,000 psi
6. Elongation at rupture	ASTM D 790-70	Min. 2%
7. Heat distortion temp.	ASTM D 648-61	Min. 167°F
8. Weight change after 28 days storing in distilled water	ASTM D 570-63	Max. 150 mg/sample
9. Surface hardness (Barcol)	ASTM D2583-67	Minimum 80% of resin's normal

- B. Reinforcement: Reinforcement shall be fiberglass mat, continuous roving, chopped roving and/or roving fabric. The fiberglass shall be type "E" and a finish compatible with the resin used.

The interior surface shall be reinforced layer 0.25 mm to 0.50 mm (10 to 20 mils). Reinforcement materials shall be:

1. Chemically resistant
2. Organic Surfacing veil
3. Asbestos

and they must have a coupling agent which will provide a suitable bond between the reinforcement and the resin.

- C. Fillers: Fillers, when used, must not degrade the resin chemical resistant properties as defined in Section 3.A of this specification.
- D. Additives: Additives, such as thixotropic agents, catalyst and promoters may be added as required by the specific manufacturing processes used to meet this standard.
- E. Laminate: (Cured composite including glass fiber reinforcement.) Cured laminate must meet the following conditions:

<u>Property</u>	<u>Test Method</u>	<u>Requirements</u>
1. Glass Content (9% by weight)	ASTM D2584-68	20 + 70 %
2. Compressive Strength	D 695-69	Min. 12,000 psi
3. Flexural Strength	D 790-70	Min. 12,000 psi
4. Flexural E-modulus	ASTM D790-70	Min. 700,000 psi
5. Surface Hardness	ASTM D2583-67	Min. 90% of resin's normal

#### 4. REQUIREMENTS

- A. Manufacturer Submitted: The manufacturer shall file with the Engineer the following prior to approval for installation.
1. Detailed design calculation for all structural components of the wetwell.
  2. Detailed prototype test procedures and test results to include:
    - a. Static Load test for H-20 (16,000 pounds dynamic wheel load incorporating 1.5 impact factor, 1.33 factor of safety with a long term strength retention of 80%.
    - b. Deflection test.
    - c. Stiffness test.
    - d. Soundness test.
    - e. Barcol Harness Cure test.
    - f. Thickness test.
    - g. Chemical Resistance test.



3. Detailed quality control to demonstrate conformance to design values and likeness to prototype wetwell features.
- B. Rejection of Wetwells: Wetwells are subject to rejection on account of any of the following visual defects.
1. Fuzz: Glass fibers loosely adhering to manhole which are not wet out with resin.
  2. Protruding Fibers: Glass fibers sticking out from pipe surface that are not wet out with resin.
  3. Resin Runs: Runs of resin and sand on surface of manhole.
  4. Dry Areas: Areas in laminate with glass not wet out with resin.
  5. Delamination: Separation in the laminate.
  6. Blisters: Light (straw) colored areas resulting from too hot a cure.
  7. Craze: Crack usually star shaped; caused by sharp impact.
  8. Surface Pits or Voids: Small air pockets on the surface or directly), beneath the surface mat.
  9. Wrinkles: Smooth irregularities on the surface.
  10. Torn Edges, End Delaminations and End Gouges: Tears and rips in the edge of cuts.
  11. Ground Areas: Areas around lap-up which have been abraded and not covered by lay-up.
  12. Hand Layup Ragged Edges: Areas at the edge of hand layup that are not rolled down properly and rough.

#### 5. CONSTRUCTION METHODS

- A. General: The wetwell installation should follow the manufacturer's recommended installation procedures.
- B. Excavation: The Contractor shall do all necessary excavation for the wetwell. Such excavations shall be of sufficient size as to permit the proper installation of the base. All such excavating shall conform to the size and dimensions as shown on the drawings, plus a minimum of three (3) feet to permit working room. Care shall be taken to insure that the excavation is not carried to a greater depth than required. If it becomes necessary to shore the walls of the excavated area, such shoring shall be of two (2) inch material. Shoring shall be braced in such a manner as to insure support of the walls and also permit the installation of the wetwell itself without necessitating the removal of any shoring until such time as the entire manhole is completed. No shoring shall be left or backfilled around, unless authorized by the Engineer. Shoring shall remain in place for at least 24 hours after the masonry or concrete work has been completed.
- C. Backfilling: The backfilling around the outside of wetwell shall commence as soon as practical but not until approval is given by the Engineer. All forms, sheeting, shoring, bracing etc., shall be removed as backfilling is accomplished. Such backfill shall be placed in layers of not more than 6 inches and mechanically tamped to a minimum 95% standard proctor density.

#### 6. MEASUREMENT AND PAYMENT

Work provided for by this item shall be measured by each individual structure built, and paid for at the unit price bid per each, of the size, type specified, complete in place, and meeting the approval of the Engineer. "Complete in

place" shall mean all labor, materials, equipment necessary to furnish and install the wetwell.

SECTION 113120  
WET WELL VENTILATION SYSTEM (S-113)

1. Description

This specification shall govern all materials and work necessary for wet well ventilation system required to complete the project.

2. Materials

1. Duct: PVC Pipe ASTM D3034, DR 35 or 41, solvent joint
2. Fasteners: 316 Stainless steel
3. Exhaust Fan: 550 CFM at .25 inches of water

The exhaust fan shall be sidewall mounting, centrifugal belt driven type. The fan shall be designed for use in a corrosive environment of hydrogen sulfide and be constructed of fiberglass, stainless steel and other such materials required for the application. The fan wheel and inlet cone shall be of the centrifugal blower type. The fan wheel shall be of non-overloading, backward inclined type, statically and dynamically balanced. Blades, fin, inlet cones and back plates shall be securely fastened together for rigid assembly. Fan wheels and shaft seals shall be rated non-sparking in accordance with standards of the Air Movement and Control Association.

Motors and drives shall be isolated from the exhaust airstream. Electric motors, wiring, controls, and monitors shall meet NEC requirements for Class 1, Division 1, Group D hazardous areas. Motors shall be of heavy duty type with permanently lubricated, sealed ball bearings. Air for cooling the motor shall be taken into the motor compartment by means of an air tube from a location free of discharge contaminants. The entire drive assembly and wheel, as a unit, shall be removable thru the support structure without dismantling the fan housing. The wheel shaft shall be mounted in heavy duty, permanently lubricated, sealed ball bearing pillow blocks. Drives shall be sized for 165% of driven horsepower. Pulleys shall be keyed securely to the fan and motor shafts. Motor pulleys shall be of the adjustable type to allow for final balancing.

3. Submittals:

The contractor shall submit 5 sets of detailed drawings and specifications and parts lists for the engineer's review and approval.

4. Measurement and Payment:

Unless specifically included in the proposal, work and materials for the ventilation system shall not be measured for pay but shall be subsidiary to other pay items.

SECTION 113130  
CHLORINATION SYSTEM (S-19)

1. DESCRIPTION

This specification shall govern all work required to furnish and install the chlorination system as required to complete the project.

2. GENERAL

This specification describes an "Advance gas feeder manufactured by Capital Controls Company of Colmar, Pennsylvania. The gas feeder shall be the Model 203 ADVANCE Gas Feeder and shall be of the vacuum operated, solution feed type.

The gas feeder shall have a maximum capacity of 500 pounds per day of chlorine gas feed and shall be equipped with two remote mounted gas flowmeters of 300 pounds of gas feed per day. The gas feeders shall mount directly on the gas manifold valve by means of a positive yoke type, gasket connection and shall be provided with a gas valve direction indicator.

3. DESIGN

The gas feeder design shall provide for conveying the gas under vacuum from the vacuum regulator to the ejector-check valve assembly to insure complete system safety. The gas feeder design shall permit the entire system to be vacuum checked in the field without using special tools or manometers. The gas feeder shall be constructed of materials specially selected for wet or dry gas services. All springs used in the gas feeder shall be of a tantalum alloy for chlorine. The rate valve and seat shall be constructed of fine silver. A double thickness diaphragm shall be provided for vacuum regulation.

The rate of gas feed shall be set manually and shall remain constant until manually changed. A differential pressure regulator shall not be required for gas flow control.

The gas feeder shall be convertible to automatic control by insertion of a motorized control valve in the vacuum line to receive a signal from appropriate control equipment.

4. COMPONENTS

Feeder

The gas feeder shall be comprised of the following: vacuum regulator or indicating meter, panel mounted dual gas flow meters with two manual rate valve, pressure relief valve, two ejector-diffuser assemblies, gas supply indicator, (manifold).

Vacuum regulator

The vacuum regulator shall mount directly on the gas valve by means of a positive yoke type, gasket connection. Vacuum shall be controlled by a spring opposed diaphragm regulator which shall close tight upon loss of vacuum. The regulator shall be equipped with a gravity actuated, loss of gas indicator, and gas flowmeter.

Gas Flowmeters and Rate Valves

The gas flowmeters with solid silver rate valves and solid silver seats for chlorine shall be mounted on a chemical resistant panel for wall mounting. The gas flowmeter(s) shall indicate the flow of gas to a minimum of 1/20 maximum feed.

#### Relief Valve

Pressure will be prevented from building up in the system by means of a spring loaded, diaphragm actuated pressure relief valve located at the vacuum regulator. The gas shall vent at the vacuum regulator.

#### Ejector-Diffusers

Two ejector-diffuser assemblies shall receive all gas and ejector water and discharge the resulting solution to the points of application. The ejector shall be equipped with a check valve which will prevent water from backing up into the vacuum regulators. A loss of water supply shall automatically shut-off the gas flow. Ejector shall have 1" inlet and outlet.

#### Supply Indicator

The gas feeder shall be equipped with a gravity actuated device, directly connected to the main control diaphragm, to indicate when gas supply is exhausted.

#### Valve Direction Indicator

A gas valve direction indicator shall be provided with each gas feeder.

#### Manifold (For Eight Cylinders)

The manifold shall be (horizontally) oriented and constructed of 3/4" schedule 80 Grade A, types, seamless carbon steel pipe per ASTM A-106 and forged steel 3000 lb. CWP fitting per ASTM A-105, and shall include a drip leg with heater, header valve for mounting the gas feeder, and flexible connectors for connection to eight gas cylinders.

#### Electrical

Power supply to the drip leg heater shall be (120 VAC, 60 Hz) single phase.

Electrical conduit and wire shall extend from the proposed chlorine building to the power source in the adjacent sludge pump building. Wire shall be size 12 TWR minimum.

#### Portable Building

A 6' x 6' x 7' portable chlorine building with cabinet shall be furnished and installed at location indicated in plan.

#### Mask

A chlorine gas mask shall be furnished.

#### Chlorine cylinders

Eight 100 lb. cylinders of chlorine shall be furnished by the City and installed by the Contractor.

#### Miscellaneous components

Gate valves, gages, Y-type strainers and connections shall be corrosion resistant and designed for exterior use. PVC pipe shall be schedule 80 unless indicated otherwise in drawings.

### 5. OPERATION MANUAL

The chlorinator supplier or manufacturer shall provide five copies of an operation manual to the City. Each manual shall include but not be limited to the following items.

- a. Schematic diagram of entire chlorinator system.
- b. Parts and assemble diagram with parts numbers for ordering.
- c. Operations and maintenance procedures and schedule.

6. WARRANTY

The City shall be supplied with a written one year warranty against defective chlorination equipment from the manufacturer and supplier.

7. MEASUREMENT AND PAYMENT

Measurement of the chlorination system shall be made as a lump sum. Measurement shall include but not be limited to, all chlorination equipment, filter water supply lines, diffuser lines, fitting, chlorine building, mask, four chlorine cylinders, mounting brackets, valves, gages, and strainers.

Payment shall be made at the unit price bid and shall fully compensate the contractor for all equipment, labor, materials and other incidental required for furnishing and installing the chlorination system.

SECTION 132010  
Ground Storage Tank for Water  
(Bolted Steel)

1. DESCRIPTION

This specification shall govern all work necessary for furnishing and installing the factory-coated (galvanized) bolted steel tank for water storage required to complete the project.

2. GENERAL

The project shall consist of furnishing and erecting a 750,000-gallon potable water storage tank on concrete foundation. The tank shall have a nominal diameter of 73 feet with a 24' height. The tank shall have a minimum of 1:12 outward draining coned roof and a steel bottom. The tank shall be complete with all pipe connections, access openings, nozzles, taps, drains, ladders, vent. The Contractor to provide designs for tank and concrete foundation. All foundation design work shall performed by a registered professional engineer, licensed to practice in the state of Texas. The tank design shall be accompanied by a certification attested by the manufacturers design engineer that the design meets all TNRCC, AWWA, and NSF requirements.

3. MATERIALS

The tank shall meet all requirements of AWWA D103-97, NSF 61, and Title 30 Texas Administrative Code, Chapter 290.43. All metal components, hardware and accessories shall be galvanized. Zinc metal suitable for immersion in drinking water shall be applied to the parts after fabrication in accordance with the recommended practices of the American Hot Dip Galvanizers Association in compliance with ASTM 123 and ASTM 153.

4. DESIGN DATA

The following information shall be used as a basis for design and erection of the tank and appurtenances.

TANK CAPACITY - 750,000 gallons  
DIAMETER - about 73 feet  
HEIGHT - about 24 feet  
OVERFLOW HEIGHT - 23' 6" or match existing overflow height  
SEISMIC ZONE - 0  
CONTENTS - potable water  
WIND LOAD - 125 mph  
OVERFLOW - 7,000 gpm  
DRAWDOWN - 10,000 gpm for vent

5. ACCESSORIES

Shell manway shall be near bottom of shell ring, and be shown in the shop drawings submitted by the Contractor.

Provide inlet connection, outlet connection and overflow and drain outlet and show in submittal drawings.

Provide a 1-inch NPT tank connection for sampling and show in submittal drawings.

Overflow pipe shall be internal and external with internal weir with a minimum capacity of 7,000 gpm and shown on drawings.

Ladder shall be galvanized steel and be provided with a backguard safety cage and a lockable anti-climb assembly.

Steel handrail (top catwalk) shall be provided between exterior ladder and manways thru the roof, and between ladder and the screened vent. The handrail shall enclose a 100 square foot landing area at the manway. The handrail shall be capable of supporting 100 lb/ft lateral loading.

A 24" pressure-vacuum screened vent shall be provided on the roof. The vent shall have openings that facilitate removal of screen. The screen shall be 316 stainless steel with a minimum size of 24" x 24" x .018 wire mesh insect screen.

A separate pressure-vacuum relief valve/mechanism shall be provided which will operate in the event screens become clogged over with foreign material, and designed for 10,000 gpm draw-down.

The tank roof shall have two curbed; upward opening 30" square-opening lockable hatch located near the ladder and over the overflow weir. The curb shall extend 4" above the tank and have a 2" overlap with cover and gasket.

A pressure gage shall be mounted on the tank shell about 3" from the bottom. The gage shall be calibrated in feet of water and have a full-scale reading between 25 and 30 feet.

Gaskets and sealant shall meet AWWA, FDA, NSF61, AND EPA standards for potable water. Bolted connections shall incorporate a prefabricated gasket. Neoprene backed washers or approved equal shall be at all bolts/nuts in contact with the stored water.

## 6. SUBMITALS

Shop drawings (6 sets) shall be submitted for review and approval of the City of Corpus Christi prior to fabrication. The shop drawings shall be submitted on 24" x 36" drawings and include sufficient data to show that the tank and accessories conform to the requirements of the specifications. A professional engineer licensed in the state of Texas shall prepare and design the foundation, and associated appurtenances. The shop drawings shall include all erection drawings, accessories and foundation.

Submit mill test on steel plate and structural members demonstrating that the physical and chemical requirements of the specifications have been met.

## 7. CONSTRUCTION

Erection of the tank shall done in accordance with the manufacturer's recommendation. Particular care shall be exercised in handling and



bolting the tank plates, supports, and members to avoid abrasion or scratching the coating. Prior to placing water in the tank, a coating inspection of the entire tank will be performed. Touch-up coating in accordance with the manufacturer's recommendations shall be done where needed. The tank manufacturer's rep shall certify in writing to the City that the tank installation meets all manufacturers' requirements for installation.

#### 8. CLEANING, DISINFECTION, INSPECTION & TESTING

Piping shall be pressure tested per 026202 the standard specs and disinfected per 026402 of the standard prior to testing tank.

The City shall provide water for initial test.

Cleaning and disinfection of interior surfaces shall be performed by the Contractor in accordance with AWWA C652. Disinfection shall be done with sodium hypochlorite (15% available chlorine) by Chlorination Method 3. After removal of all foreign material, all interior surfaces shall be thoroughly cleaned using a high-pressure water jet. All water dirt and foreign material accumulated in the cleaning operation shall be discharged from the tank. Approximately 1 foot (30,000 gallons) of potable water shall be added to the cleaned tank after which sodium hypochlorite shall be added to the water in the tank such that a chlorine concentration in water would be 50 mg/l when the tank is filled to 5% of the total storage volume (37,500 gallons). Approximately 13 gallons of sodium hypochlorite solution (15% available chlorine) shall be added to the 30,000 gallons of water in the tank. Add an additional 7,500 gallons of water in the tank to achieve 5% of the volume of the tank or a depth of 1.2 feet. This solution shall held in the tank for not less than 6 hours. The tank shall then be filled to the overflow level by adding potable water to the concentrated solution. The tank shall be held full for not less than 24 hours. The water shall then be tested for coliform organisms by the Water Department.

If no leaks are observed at the end of the 24 hour holding period and satisfactory bacteriological testing and aesthetic quality water quality are achieved, the water in the tank may be incorporated into the distribution system, provided that the free chlorine residual is between 2 and 4 mg/l.

The City shall provide water for initial test. If the water is contaminated such that it can not be reincorporated into the distribution system, the Contractor shall be responsible for properly disposing of it and pay for the additional water.

#### 9. MEASUREMENT & PAYMENT

Unless indicated otherwise in the proposal, Factory-Coated (Galvanized) Bolted Steel Tanks for water shall be measured as individual units. Payment shall include furnishing, erecting, testing, disinfecting, the completed tank, complete with foundation, piping and valving, and site preparation and shall compensate for all materials, labor, equipment, and incidentals required to complete the work.

SECTION 150620  
PLUMBING (S-90)

1. DESCRIPTION

This specification shall govern all work necessary for the installation of plumbing required to complete the project.

2. MATERIALS

Pipe shall be hot-dipped galvanized steel water pipe schedule 40.

Fittings shall be threaded type using galvanized malleable iron fittings. All joints shall be coated with an appropriate epoxy and up to 3 inches of the adjoining pipe, after installation.

Pipe Supports shall rigidly support pipe to concrete bulkhead. Clamps shall be galvanized steel with an epoxy coating applied both before and after installation. Perforated strap hangers will not be permitted.

Water Faucet shall be 3/4" hose connection, rough brass, T-handle and of good quality.

3. PERMITS AND BUILDING CODES

The Contractor shall be responsible for obtaining plumbing permit and work shall comply with applicable requirements of the City.

4. CONSTRUCTION METHODS

(1) Handling Materials

The Contractor shall be responsible for the safe storage of all materials furnished to or by him and accepted by him until it has been incorporated into the completed project. The interior of all pipes shall be kept free from dirt and foreign matter. All materials found during the progress of work to have defects will be rejected, and the Contractor shall remove such defective material from the site.

(2) Sterilization

Fittings: Valves and fittings shall be kept clean. Where soil or other substances come in contact with the water surface of the fittings, the interior shall be washed and sterilized with 2% solution of calcium hypochlorite.

Pipe: As each joint of pipe is placed the contractor, unless specified otherwise by the Engineer, shall throw powdered calcium hypochlorite (70%) through the length of the joint. (One pound for each 1680 gallons of water to give 50 mg./1.) After the line is assembled, it shall be slowly filled with water and allowed to stand for 48 hours. After sterilization is completed, lines shall be flushed. The Engineer will take a sample test 2 hours after refilling. If the sample does not pass State Health Department purification standards, the procedure shall be repeated. The entire procedure shall be coordinated with and under the supervision of the Water Division Superintendent/Engineer. During the sterilization, process valves shall be operated only under the supervision of the Water Division Superintendent/Engineer. There shall be a fee of \$100 paid by the Contractor to the City for each retest that is required.

(3) Hydrostatic Testing Water System

See Section 026202 Hydrostatic Testing of Pressure System.

5. MEASUREMENT

Unless specified otherwise in the special provisions, measurement shall be made as follows:

Pipe will be measured by the linear foot along the centerline for each size of pipe installed. Measurement shall be up to but not include the fittings.

Fittings will be measured as individual units for each type and size installed.

6. PAYMENT

Payment shall include but not limited to all materials, labor, equipment, support clamps, testing, sterilization, and all other incidentals necessary to complete the job.

SECTION 151010  
GATE VALVES (S-103)

1. DESCRIPTION

This specification shall govern all work required to furnish gate valves required to complete the project.

2. GENERAL

All valves comply with AWWA C-500 or C-905. Valves shall be designed for a minimum 150 psi working pressure service with gate open. Valves shall have an unobstructed waterway of a diameter of not less than the full nominal diameter of the valve. Valves shall be of vertical mount, conventually packed stem, non-rising stem with spur gear and grease case, iron body, bronze mounted, double disk, parallel seat or resilient type gate valves furnished with 125 lb. flanged ends, valve position indicator, and clockwise close. Prior to shipping, the contractor shall submit five sets of detailed drawings and specifications and maintenance instructions for the Engineer's review and approval.

3. PAINTING

Valves shall be painted in accordance with Section 099020.

4. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, Gate Valves shall not be measured and are considered subsidiary to the appropriate bid item.

SECTION 151020  
CHECK VALVES (LEVER & WEIGHT OPERATION) (S-104)

1. DESCRIPTION

This specification shall govern all work necessary to furnish the check valves required to complete the project.

2. GENERAL

The check valves shall be in accordance with AWWA C508 and prevent the return of fluid through the valve upon pump shut-off. It shall be Muller Type A-2600-6-01 or approved equal. It shall have a heavy cast, iron body with bronze clapper disc seated by a bronze clapper arm against a bronze seat ring. The clapper shall be secured to a stainless steel shaft which turns in bronze bushings. The valve shall have 125 lb. flanged ends. The valve shall be of lever and weight operation. Prior to shipping, the contractor shall submit five sets of detailed drawings, specifications, installation instructions and maintenance instructions for the Engineer's review and approval.

3. FIELD SERVICE

The manufacturer's field representative shall check the installation, adjust valves and be on-hand for initial start-up of the system.

4. PAINTING

See Section 099020.

5. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, check valves shall not be measured and will be considered subsidiary to the appropriate bid item.

SECTION 151030  
ECCENTRIC PLUG VALVES & ELECTRIC MOTOR ACTUATORS (S-105)

1. DESCRIPTION

This specification shall govern all work required for furnishing eccentric plug valves & electric actuators required to complete the job.

2. MATERIALS

Plug valves shall be of the tight closing resilient faced, non-lubricated variety and shall be of eccentric design such that the plug rises off the seat contact area during shaft rotation while opening and closing valve. In the closed position the plug shall press firmly into the seat for a dead-tight shutoff. Valves shall be drip-tight rated at pressures up to 175 p.s.i. through 12" and 150 p.s.i. for larger. The valve closing member should rotate approximately 90 degrees from open to closed position.

Valve body - cast iron ASTM A 126, Class B  
End style - flanged  
Seat - 304 stainless steel or nickel  
Bearings - stainless steel  
Plug - cast iron  
Resilient facing - Buna N or Fluorinated Hydrocarbon  
Packing - Buna Vee  
Actuator - electric motor

Electric motor modulating valve actuator shall comply with AWWA C540 and the following:

Rotation - 90 degree reversible  
Torque rating - for 125 p.s.i. differential  
Cycle time - less than 100 seconds  
Duty - 15 minutes continuous  
Manual operation - integral with declutching device  
Hand switch - integral 5 position to permit local operation  
Mechanical stops - internal to prevent over travel  
Gearing - for 30 to 60 second opening/closing  
Auxiliary limit switches - 4 SPDT: 2 full open, 2 full closed  
Heater - 8 watt minimum  
Control wiring - 120 VAC, 1 phase, 60 Hz  
Equipment actuator with zero and span adjustments  
Provide actuator with a field set choice of valve position on loss of signal  
Submersible design required

Electrical Characteristics:

Power: 120 VAC. 1 phase, 60 Hz  
Rating: NEMA 4

Local Control:

Push button station equipped with:  
Remote/local switch  
Position indication lights  
Reversible, intermittent contact  
Close - stop - open switch  
Contact closure for remote/local indication where indicated in schedule  
Enclosure - NEMA 4  
Mounting - at inflow and outflow valves adjacent to tank

Manual Operation:

Type: Handwheel, lever, or (operating nut required below ground unless specified otherwise).

General:

Comply with AWWA C504  
Maximum torque at 80 lb. input  
Worm gear for handwheel operation  
Totally enclosed worm gear

3. SUBMITTALS

The Contractor shall submit 5 sets of detailed drawings and specifications and maintenance instruction for the Engineer's review and approval, prior to construction.

4. SUPPORT FROM MANUFACTURER

Field Service: The equipment manufacturer shall furnish the services of a qualified factory field service engineer at the site to inspect the installation and instruct the City's Wastewater personnel of the operation and maintenance of the unit.

O&M Manual: The manufacturer shall furnish the Engineer with 4 sets of complete operation and maintenance manuals (including wiring diagrams).

5. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the proposal, plug valves shall not be measured for pay but shall be subsidiary to other work.

SECTION 151040  
SURGE RELIEF VALVES (S-106)

1. DESCRIPTION

This specification shall govern all work necessary for providing surge relief valves required to complete the project.

2. MATERIALS

Valves shall be full metal body, mechanical pinch type with flange joint ends on both the body and flexible sleeve. Port areas shall be 100% of the full pipe area at the valves' ends. The valve area shall be 100% of the full pipe area through the entire length of the valve.

Integral flanges shall be drilled and tapped to ANSI B16.1 Class 125 standard.

The pinch valve shall be one piece construction with integral flanges drilled to be retained by the flange bolts. The pinch tube shall be reinforced with nylon. The pinch tube shall be connected to the pinch bar by rubber tabs embedded in the tube reinforcing ply. All internal valve metal parts are to be isolated from the wastewater by the flexible elastomer pinch tube.

The steel mechanism shall be double-acting, closing the pinch tube, sleeve, from both the bottom and the top. The mechanism shall be supported in the valve body. The pinch mechanism shall be adjustable on line. The mechanism shall be connected to the cylinder actuator by a stainless steel stem.

A cylinder housing shall fully enclose the spring. The cylinder assembly shall be mounted on the valve body by means of an open yoke. The spring shall be externally adjustable for set pressure.

The yoke shall be used to limit swishes, stem position indicator, and accessories.

The valve shall normally be closed. The valve will be factory set at and easily adjusted in the field. Valve shall meet the following:

Valve Size: 2"  
Factory set cracking pressure: 40 PSI

3. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, Surge relief valves shall not be measured for pay, but shall be considered subsidiary to other work.



SECTION 151050  
SHEAR GATE (S-107)

1. DESCRIPTION

This specification shall govern all work required to furnish shear gates required to complete the project.

2. GENERAL

Shear gates shall be full opening, circular port, iron body, with a bronze seat (both body ring and gate ring) and furnished with a spigot end unless indicated otherwise on the plans. The body, gate and wedges shall be cast iron conforming to ASTM A-126 Class B. The valve shall be furnished with 2 wedges bolted to the body which may be replaced due to wear. The gate shall pivot on a bronze hinge pin. The bronze gate seat ring shall be machined to a smooth finish. The body seat ring shall be bronze, threaded and screwed into place and be machined to a smooth finish. The shear gate shall be furnished with an adjustable stop on wedge to prevent jamming gate to seat. Shear gates shall be furnished and installed with lifting handles as indicated on the plans.

3. PAINTING

Valves and lifting handles shall be painted in accordance with Section 099020.

4. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the proposal, Shear Gates shall not be measured and are considered subsidiary to the appropriate bid item.

SECTION 151060  
FLAP GATE (DRAINAGE) (S-76A)

1. Description

This specification shall govern all materials and work required for furnishing and installing flap gates required to complete project.

2. Materials

Frame Ring and Slide Cover

The frame ring and slide cover shall be cast iron with machined seating faces. A cast iron flap (cover) shall be domed construction and have machined seating faces, or have a resilient rubber seal permanently bonded in a groove and be flush with the surrounding cast iron seat face. The flap cover shall be attached to the slide cover in such a manner as to allow full opening of the cover and prevent jamming of the cover in the open waterway. Flap seat shall be inclined from the vertical a minimum of 2 °. Flap cover hinge linkage shall be galvanized steel structural. Pivot points in flap cover shall be bronze bushed. Hinge bolts shall be stainless steel. Assembly hardware and structural steel shall be galvanized. Flap gates shall be Waterman Drainage, Model FC-10 or approved equal.

Frame Ring, Flap Cover

Cast Iron - ASTM A-126, Class B

Structural Steel - ASTM A-36 - Galvanized per ASTM A-123

Assembly Hardware and Fasteners

Steel - ASTM A-307 - Galvanized per ASTM A-153 & ASTM A-123

Paint

Manufacturer's Standard

3. Construction

The frame shall be secured to the concrete with four (4) 3/4" x 6" Type 304 stainless steel bolts and nuts.

A 3" Schedule 40 Galvanized Steel Pipe & Assembly shall be provided and installed for each gate as required to secure the gate in a normally open position. The 3" pipe shall be grouted into the 4" sleeve with a lean sand cement grout. The galvanized steel hooking device shall be secured to the gate. The assembly shall be adjusted as necessary.

4. Measurement & Payment

Unless indicated otherwise in the Proposal, Flap Gates shall not be measured for pay, but shall be considered subsidiary to other work.

SECTION 151502  
ULTRASONIC DOPPLER FLOWMETER AND RECORDER (S-118)

1. DESCRIPTION

This specification shall govern all work necessary for furnishing and installing ultrasonic doppler flowmeters and recorders required to complete the project.

2. GENERAL

The flowmeter shall be ultrasonic of the doppler type for measuring flow rate in full pipes, and shall display instantaneous flow rate and shall have a totalizer and shall be capable of transmitting a signal to a Z-fold chart recorder. Flowmeter shall be POLYSONICS Model UFM84 with options specified below, or approved equal.

3. QUALIFICATIONS

The manufacturer shall have instruments of the Doppler type and configuration measuring flow in domestic wastewater for a minimum of eight years. The Contractor shall submit a suitability certification signed by both the manufacturer and the Contractor stating that the manufacturer has reviewed the plans and specifications and the equipment to be supplied will comply with the specifications and will function properly after installed.

4. EQUIPMENT

**TRANSDUCERS:** The electronic flow sensing device shall be mounted to the outside of the carrier pipe and be capable of removal without interruption of flow. Electrodes in contact with the liquid are not acceptable. The transducers shall be of the crystal type--one to transmit, the other to receive. The transducers shall be designed to operate in temperatures up to 320° F. The dual-head transducers shall be self-aligning with mount strap to be provided by the manufacturer.

**CALIBRATION:** The flowmeter calibration shall be capable of being changed to different flow ranges on 1" through 72" pipe without replacement of any components or flow sensing assembly.

**ARMORED ASSEMBLY:** The sensing element shall be supplied as a armored assembly with a jacketed flexible cable of sufficient length and shall be interchangeable between without recalibration of metering system.

**SOLID-STATE:** The sensing element shall be solid-state and the transformer isolated and designed to meet special requirements. The receiver circuit shall be double high-Q staged. The transmit circuit shall be cable length adjustable to permit transmit power to flow sensor cables up to 100 feet long.

**RESPONSE:** The flowmeter shall respond to flow rates as low as .2 feet per second when flow stream is nearly clean or contains particles and/or bubbles.

**ENCLOSURE:** The transmitter-indicator shall be housed in a NEMA 4X enclosure with gasketed shatterproof windows for meter viewing. The housing shall be front hinged for easy access for controls and be suitable for wall mounting.

**FLOWMETER ELECTRONICS:** The flowmeter electronics shall be designed to operate at temperatures between -10° and 140° F. All electronic

circuits shall be interchangeable with other flowmeters of the same model number. All electronic circuits shall be coated with an anti-fungus compound. The transmitter circuit and calibration frequency standard shall be crystal controlled. The transmitter shall be powered by 120 VAC at 50/60 Hz requiring less than 10 watts. Circuitry shall have automatic bleeds for lightning protection.

**FILTER:** An AC power line noise filter and voltage surge protector shall be provided.

**SIGNAL LOSS PROTECTION:** A signal strength meter and/or loss of signal indicator shall be provided. Output shall be driven to zero upon loss of signal.

**DAMPING:** The transmitter circuitry shall employ dual stage damping to detect flow variations and automatically change time constants to track the actual flow change for steady chart readings and smooth flow control.

**ADJUSTMENTS:** The transmitter shall include adjustments for range calibration, mA span, mA zero, output signal damping and AGC sensitivity.

**CALIBRATION PANEL:** The transmitter shall contain a calibration panel with switch and vernier dial directly calibrated in velocity units over a range of 0-1 Ft/Sec through 0-40 Ft/Sec. Dial resolution shall be in increments of .01 Ft/Sec.

**CALIBRATION CHECKING DEVICE:** A built-in calibration checking device shall be provided. This internal frequency standard shall consist of an on-board frequency device and separate reference frequencies. The manufacturer shall supply a multi-point flow calibration curve.

**CURRENT OUTPUT:** The 4-20 mA output shall be proportional to flow and isolated. The maximum resistive load shall be 600 ohms. Output current limiting circuitry shall be provided.

**DIGITAL DISPLAY OF FLOWMETER:** The transmitter shall contain a digital display of flow rate. The digital display shall be calibrated in gallons per minute.

**CROSSTALK:** The transmitter shall contain electronic means to allow crosstalk from other in-service sonic flowmeters of the same manufacturer.

**RECORDER-TOTALIZER:** The recorder shall be Z-fold 4" chart recorder with 3 continuous writing pins. The recorder-totalizer shall be a digital type to receive the 4-20 ma signal from two independent transponder assemblies. The signal from the two sources shall be integrated to display the total flow from the lift station by the third pen. The digital display will only display the instantaneous flows.

5. OPERATING CONDITIONS

**GENERAL REQUIREMENT:** The job will require that flow be measured at two locations by two separate transponder assemblies. The instantaneous flow at each location shall be independently displayed. The recorder-totalizer shall display the combined flow from the two locations.

10" PIPE CONNECTION AT LAGUNA SHORES:

Liquid to be measured: domestic sewage  
Flow range: 0-1,200 GPM  
Pipe: 10" ductile iron class 50 with  
40 mil polyethylene lining  
Diameter: OD=11.10".44" ID=10.44"  
Transducer cable length: 55 feet

16" PIPE CONNECTION AT LAGUNA SHORES:

Liquid to be measured: domestic sewage  
Flow range: 0-3,800 GPM  
Pipe: 16" ductile iron class 50 with  
40 mil polyethylene lining  
Diameter: OD=17.40" ID=16.64"  
Transducer cable length: 65 feet

6. INSTALLATION

STORAGE OF MATERIALS: The Contractor shall be responsible for the proper storage of equipment and materials.

PLACEMENT: The transducers shall be mounted to the pipes in the fiberglass manholes. The flowmeter and recorder-totalizer units shall be mounted on the wall of the control room of the lift station. Cables shall be installed in 1" PVC conduit along side the pipe for underground installation and in 1" aluminum conduit mounted to the exterior wall of the valve vault and interior wall of the existing structure for above-ground installation.

CALIBRATION AND INITIAL OPERATION: The equipment supplier shall provide the services of a qualified field representative to calibrate and set up equipment as required for proper operation. After the system is functioning properly, the equipment supplier shall prepare a final report to be submitted by the contractor to the engineer. The final report shall address any revisions or modifications which are not consistent with the original submittals for the equipment. Four copies of the report shall be submitted as part of the O&M Manual.

7. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the proposal as bid item, providing and installing of ultrasonic doppler flowmeter and recorder shall not be measured for pay but shall be considered subsidiary to other work.

SECTION 151620  
SUBMERSIBLE PUMPS FOR WASTEWATER (S-114)

1. DESCRIPTION

This specification shall govern all work necessary for furnishing, installing, and placing into operation the submersible pumps with accessories required to complete the project.

2. GENERAL

Pumps shall be designed and constructed to pump raw unscreened sanitary sewage and capable of passing 3" diameter spheres. Design of mounting system shall facilitate removal and inspection of pumps. There shall be no need for personnel to enter wet well for inspection and maintenance of pumps. Lifting chain, guide rails and mounting system shall be provided and installed for each pump. Pumps shall be designed, built and installed in accordance with best available technology and practice, and shall operate satisfactorily when installed.

3. WARRANTY

The pump manufacturer shall furnish the City with a written guarantee to warrant pumps and components against failure due to defective materials and workmanship for a period of 5 years after full operation and acceptance by the City. The warranty shall include 100% coverage of manufacturer's shop labor and parts for the first year, then 50% coverage through the 5th year. Pumps repaired under warranty shall be returned to the City's Wastewater Department with freight prepaid.

4. QUALIFICATIONS OF BIDDER

4.1 Manufacturer & Supplier: The submersible pumps and accessories, with the possible exception of the discharge connection assembly which shall be Flygt or compatible, for each lift station shall be furnished by a single manufacturer/supplier who is fully experienced, reputable and qualified in the manufacturer of the pumps to be furnished.

4.2 Prebid Submittals: General The Contractor shall obtain tentative approval of the submersible pumps prior to bidding the project. Tentative approval does not relieve the Contractor of the responsibility of providing and installing pumps that will comply with all sections of these specifications and that will function properly. To obtain tentative approval for bidding, the Contractor shall submit the following pre-bid submittals at least 3 weeks prior to the bid opening. Failure to obtain tentative approval shall be considered grounds for rejection of bid.

Suitability Certification

The Contractor shall submit a certification stating that the manufacturer's authorized representative for the pumps has studied the Contract Documents (plans and specs), evaluated conditions affecting these pumps, and certifies that they should be suitable for the application and should require no more than normal maintenance if not damaged or abused. The certification shall state that the proposed pumps are suitable for the application and will function as intended and will comply with all requirements of this specification, with the exception of those listed in the certification. The certification shall be

signed by the Contractor and the Manufacturer's authorized representative. If the equipment is approved for use on the project and is found at any time to have unlisted exceptions, the Engineer shall have the right to reject the equipment or require the Contractor to bring the equipment into compliance at no cost to the City.

#### Pump Data

The Contractor shall furnish certified pump curves showing the results of test pumping units of identical design, size, and horsepower as those to be furnished. Catalog curves are not acceptable. Graphs shall include:

1. Pump Curve - Q in GPM, H in FEET
2. Power Input Curve - KILOWATT
3. Efficiency Curve (including motor) wire to water
4. N.P.S.H. Curve
5. Model, Impeller size, serial number
6. Motor rated HP, Voltage
7. Date and place of test
8. Customer for whom test was conducted
9. Data in English units (gallons, feet, etc.)

#### 5. MATERIALS

##### 5.1 Pump Construction:

#### General

Major parts, including lifting cover, stator casting, volute, and impeller, shall be ASTM 48, Class 30 gray cast iron. All nuts, bolts, washers, and fastenings shall be of 316 stainless steel. Ferrous metal surfaces coming into contact with wastewater shall be protected with a coating of rubber-asphalt paint.

#### Power Cable

The motor power cable shall consist of well insulated cable with a double jacketed system, Hypolon outside, synthetic rubber inside, exceeding industry standards for oil, gas, and sewage resistance and shall be permanently marked with the indicated code. Sizing shall conform to NEC specifications for pump motors and shall be of adequate size to allow motor voltage conversion without replacing the cable. Each pump shall be installed with a sufficiently long power cable to suit the installation as shown on the drawings without splicing.

#### Power Cable Entry

The cable entry seal shall insure a watertight and submersible seal. The cable entry shall be comprised of a single cylindrical elastomer grommet flanked by a stainless steel washer, all having close tolerance fit against the cable and compressed by the entire body containing a strain relief function, separate from the function of sealing. A separate junction chamber shall provide for connection of the cable to the stator power leads. The junction chamber shall be separated from the motor stator housing by a terminal board which is bolted to a machined surface using an o-ring seal. Stator leads shall also be sealed to prevent moisture from entering the motor interior.

#### Impeller

The impeller shall be of non-clog design, capable of handling solids fibrous

material, sludge, etc. with long thoroughfare having no acute angles and shall be dynamically balanced. The impeller shall be class 30 gray cast iron, coated with a ceramic coating to provide wear resistance to particle erosion caused by sands and silts typically found in sewage. The coating shall have a minimum thickness of .05". The fit between the shaft and impeller shall be a sliding fit with one key. Fastening of the impeller to the shaft shall be by a locking assembly which is sealed from the liquid by a protective rubber cap and a bolt threaded to the shaft end.

#### Volute

The volute shall be single piece gray cast iron and shall have a replaceable wear ring.

#### Wear Rings

Stainless steel wear rings shall be fitted to the volute and the impeller.

#### Discharge Connection

Each pump shall be supplied with a coupling, ANSI 125 cast iron, which bolts to the discharge flange, if other than Flygt. The floor mounted discharge elbow shall be compatible with the Flygt model specified as follows:

At Laguna Shores	CP 3201
At Riviera	N/A use existing

No part of the pump shall bear directly of the sump floor and no rotating motion of the pump shall be required for sealing. Sealing at the discharge shall be effected by metal to metal contact of the pump discharge flange and the mating discharge connection either with or without a replaceable rubber seal form fitted to the machine discharge coupling to insure a positive leak proof system and for ease of removal of the pump.

#### Bearings

Pumps shall be equipped with three lubricated bearings, one upper and two lower. The upper shall restrain radial thrust and be of the single row roller type. The two lower shall consist of one roller for radial thrust and one angular contact for axial thrust. Bearings shall have a minimum design life of 40,000 hours.

#### Lower Bearing Temperature Sensor

Pumps with motors larger than 60 HP shall have a lower bearing temperature sensor to monitor the lower bearing temperature, unless the bearings are lubricated with circulating force fed oil.

#### Shaft

The shaft shall be of large one piece design and extend through the pump and motor. The shaft shall be constructed of stainless steel, unless the entire shaft is not exposed to the pumped liquid, in which case the shaft may be C1034 carbon steel.

#### Shaft Seals

Shaft seals shall have lapped tungsten carbide faces. The seal system shall



allow continuous pump operations with the exterior completely dry. The seal assemblies shall not require adjustments, shall be easily inspected, shall be easily replaceable and shall not require operating pressure differential for sealing.

#### Guide Brackets

A guide bracket shall be Flygt compatible and shall allow raising and lowering of the pump in the wet well without binding with the guide rails. No special adjustment shall be necessary to assure proper alignment. Guide brackets shall be cast iron or stainless steel.

#### Motor

The pump motor shall be integral to the pump for submersible or dry well operation. The motor shall be squirrel cage induction type with class F insulation, NEMA B design, class H slot liners with a service factor of 1.15 or above. The dual voltage copper wound stator, which will allow field changeability of voltage, shall be triple dipped in epoxy enamel or varnish to withstand a heat rise of 155° C as defined in NEMA Standard MG-1. The NEMA starting code shall be F or less. The motor shall be statically and dynamically balanced. The motor shall be designed for continuous operation at 400° C ambient air and be capable of up to 10 starts per hour.

#### Stator Temperature Sensor

Stator temperature sensors switch shall be embedded in the stator windings and shall be used to stop the motor when the stator temperature exceeds 155° C. The motor shall resume operation when the stator cools to 150° C.

#### Cooling System

Motors shall have a forced convection type of cooling system.

#### 5.2 Accessories:

##### General

Pump, accessories, controls, rails, hardware, etc. shall be furnished by the pump manufacturer. The pump manufacturer shall be responsible for the coordination and compatibility of accessories. The accessories shall be warranted against defects and corrosion by the manufacturer for five years after final acceptance of the project.

##### Lifting Chain

A lifting chain assembly shall be provided and installed for each pump. The chain and shackle shall be of 316 stainless steel and have a minimum working load of two times the pump weight. The chain shall be secured to the pump with the shackle and to the access cover with a hook. A five foot length of excess chain shall be suspended at the hook to facilitate the lifting of the pump.

##### Access Covers

Access covers and frames shall be of aluminum. The door panels shall be 1/4" thick diamond plate designed to withstand a live load of 150 lbs, per square foot. The door shall be provided with stainless steel hinges with tamper-proof fasteners. All hardware shall be stainless steel. The door shall open to 90°

and automatically lock in that position with a stainless steel positive locking arm and release handle. The door shall close flush with the top of the frame.

#### Guide Rails

Guide rails shall be schedule 40 type 316 stainless steel pipe of suitable diameter. The rail shall be held in position with upper, intermediate (if bar exceeds 20' in length) and lower guide bar brackets. The upper guide bracket shall be stainless steel and designed to allow simple removal and replacement of guide bar without entering the wet well. The intermediate bracket shall be of stainless steel and be installed about midway between the upper and lower bracket.

#### Float Cable Rack (not applicable for doppler controls)

A stainless steel cable rack shall be provided and attached to the upper frame. The rack shall support the level control float cable.

#### Power Cable Supports

Stainless steel power cable supports, Kellum type, shall be used for power cables to all motors. The supports shall be attached to eyebolts bolted into the concrete on the side of the access opening.

#### Hardware

All nuts, bolts, fasteners, fabricated metal, etc. shall be Type 316 stainless steel.

### 5.3 Electrical Controls:

The pump supplier and the Contractor shall provide for proper control operation and protection. The electrical control panels for the pumps shall be supplied to the Contractor by the pump supplier to assure component compatibility. See drawings for electrical equipment to be supplied.

### 5.4 Preconstruction Submittals

#### Pump Data (same as prebid submittal)

The Contractor shall furnish certified pump curves showing the results of test pumping units of identical design, size, horsepower as those to be furnished. Catalog curves are not acceptable. Graphs shall include:

1. Pump Curve - Q in GPM, H in Feet
2. Power Input Curve - KILOWATT
3. Efficiency Curve (including motor) wire to water
4. N.P.S.H. Curve
5. Model, Impeller size, serial number
6. Motor rated HP, Voltage
7. Date and place of test
8. Customer for whom test was conducted
9. Data in English units (gallons, feet, etc.)

#### Parts List and Specifications

A comprehensive list of all station accessories and pump components, listing

material type shall be submitted for the Engineer's review and approval.

Shop Drawings

Shop drawings of station accessories and pump components and connections shall be submitted for the Engineer's review and approval.

Supplemental Construction Details

The construction drawings depict the approximate locations of pumps and access covers. Supplemental drawings depicting the precise locations of anchor bolts, pump mounting system, access covers, guide rails, etc. will be required for the type of pump to be used. These supplemental drawings shall be prepared by the pump supplier and submitted by the Contractor to the Engineer for documentation of the project. The supplier shall be responsible for completeness and accuracy of shop drawings and any applicable revisions, as required to successfully complete the construction.

Wiring Diagrams

See construction Drawings for wiring diagrams.

6. OPERATING CONDITIONS

Pump Sequences

0 & 1 pump alternating:

#1 0 #2 0 #3 0 #4 0 #1 0 #2 0  
----one----cycle----

1 & 2 pumps alternating:

#2 #3 #4 #1 #2  
#1 #2 #2 #3 #3 #4 #4 #1 #1 #2  
----one----cycle----

2 & 3 pumps alternating:

#3 #4 #1 #2 #3  
#2 #3 #3 #4 #4 #1 #1 #2 #2 #3  
#1 #2 #3 #3 #3 #4 #4 #1 #1 #2  
----one----cycle----

Control Settings

Elev.	Rising	Descending
-5.80	Alarm On	
-6.05	P <sub>1</sub> + P <sub>2</sub> + P <sub>3</sub> on	

-6.15 P<sub>1</sub> + P<sub>2</sub> on P off  
 -6.40 P<sub>1</sub> + on P off  
 -6.75 Min. W.S. P off  
 -8.25 Bottom of Sump

Pump Operating Conditions

Pump Discharge Size: 8"  
 Max. Head Condition:  
     1220 GPM @ 105' TDH, Minimum Total Efficiency 57%  
 \*    1185 GPM @ 105' TDH, Minimum Total Efficiency 57%  
     1173 GPM @ 105' TDH, Minimum Total Efficiency 57%  
 Mid. Head Condition  
     1824 GPM @ 85' TDH, Minimum Total Efficiency 60%  
 \*    1771 GPM @ 85' TDH, Minimum Total Efficiency 60%  
     1753 GPM @ 85' TDH, Minimum Total Efficiency 60%  
 Min. Head Condition  
     2226 GPM @ 69' TDH, Minimum Total Efficiency 57%  
     2162 GPM @ 69' TDH, Minimum Total Efficiency 57%  
     2140 GPM @ 69' TDH, Minimum Total Efficiency 57%  
     Total Efficiency = combined pump and motor  
 Max. RPM: 1750

6.2 Riviera Lift Station: (three pumps required)

Pump Sequences

0 & 1 pump alternating:

#1      0      #2      0      #3      0      #1      0      #2      0  
 ----one----cycle----

#2                    #3                    #1                    #1  
 #1            #2            #2            #3            #3            #1            #1            #2  
 ----one----cycle----

Control Settings

Elev.	Rising	Descending
-5.80	P <sub>1</sub> + P <sub>2</sub> + P <sub>3</sub> on + Alarm	
-6.00	P <sub>1</sub> + P <sub>2</sub> + on	P <sub>3</sub> off
-8.25	P <sub>1</sub> on	P <sub>2</sub> off
-10.00	Min. W.S.            P <sub>2</sub> off	
-12.25	Bottom of Sump	P <sub>1</sub> off

Pump Operating Conditions

Pump discharge Size: 6"  
Max. Head Condition: 613 GPM @ 67' TDH, Tot. Eff. 45%  
Mid. Head Condition: 989 GPM @ 51' TDH, Tot. Eff. 54%  
Min. Head Condition: 1100 GPM @ 46' TDH, Tot. Eff. 53%  
Total Efficiency = Wire to Water Efficiency  
MAX. RPM: 1750

### Discharge Connection

The three discharge connections that are currently in place are designed to accept Flygt Model CP3152 Pump Impeller 432 with 8" discharge.

## 7. CONSTRUCTION METHODS

### 7.1 Delivery and Storage of Materials:

Parts and equipment shall be properly protected so that no damage or deterioration will occur during transport and during storage. Factory assembled components shall not be dismantled, unless done so under the supervision of the authorized pump manufacturer.

### 7.2 Installation:

#### General

Installation of the pumps shall be in strict accordance with the manufacturer's instructions and recommendations.

#### Placement of Pumps and Accessories

The location of the discharge piping is shown on the construction drawings. The location of the pumps, access covers, and discharge connection are approximate.

The precise placement and alignment of anchor bolts, discharge assembly guide rails, access cover and associated connections shall be in accordance with supplemental construction details provided by the pump manufacturer. The manufacturer shall check alignment during start up field testing. Improper alignment shall be corrected prior to continuation of testing.

### 7.3 Start-up Inspection

#### Installation Inspection

After the pumps have been completely installed and wired, the Contractor shall remove the pumps to the deck of the wet well and the pump manufacturer shall:

- a. Megger stator and power cables
- b. Check seal lubrication
- c. Verify proper rotation
- c. Check power supply voltage
- e. Measure motor no load current

#### Operating Check

After initial inspection, the Contractor shall lower pumps into pumping position and confirm proper alignment and connection. The service representative shall then perform an initial operation check of each pump including:

- a. Motor current with discharge valve closed
- b. Motor current with discharge valve open
- c. Power supply voltage with 1, 2, 3, ... pumps running
- d. Vibration
- c. Check level control and sequence

8. FINAL SUBMITTALS

8.1 Inspection Report: (four copies required)

The results of the Installation Inspection and Operating Check shall be submitted as a written report of findings and data determined with regard to the pumps, motors, level control, sequence, accessories, electrical, etc. The report shall be prepared and signed by a Registered Professional Engineer employed or retained by the pump manufacturer.

8.2 Manual: (included with Inspection Report)

The Operation and Maintenance Manual shall be included with the Inspection Report with one manual for each of the four copies of the report. The O&M Manual shall include a minimum of the following:

- 1. Service Location & phone
- 2. Fact Sheet (pump data)
  - Serial No.
  - Pump Curve
- 3. Maintenance instructions & schedule
- 4. A shop service manual
- 5. An assembly manual showing all parts by their catalog number for ordering

8.3 Spare Parts:

Unless it can be demonstrated that local parts and service have been available through the same financially sound firm on a continuing basis for at least 10 years, the spare parts listed below must be furnished with the pumps at no additional costs to the City.

Spare Parts: (For each type of pump)

Impeller	Service Tools
Upper mechanical seal	Wear ring
Lower mechanical seal	Cable entry assembly
Complete set of o-rings and gaskets	Power Cable
	Set of bearings

9. MAINTENANCE TRAINING WORKSHOP

The equipment manufacturer shall conduct an 8 hour training workshop under the direction of a qualified factory field service representative. The workshop shall be conducted both at the job site and at a training room provided by the Wastewater Department.

10. MEASUREMENT AND PAYMENT

Pumps and accessories shall not be measured for pay but shall be subsidiary to the appropriated bid item.

SECTION 151630  
PROPELLER PUMPS (S-38)

1. DESCRIPTION

This specification shall govern all work required for furnishing, installing and placing into operation the propeller pumps required to complete the project.

2. GENERAL

Pumps shall be designed for handling pre-treated domestic wastewater and suitable for high volume and low head operation. Pumps shall be single stage, 12", vertical, water lubricated, propeller type. Each pump shall include a bowl assembly, column, open line shaft, and above ground discharge head. Pumps shall be Fairbanks Morse 12" Model 8211, 1770 RPM, with B-1369.5 vane or approved equal. Three pumps shall be required.

3. PUMP CONSTRUCTION

Bowl Assembly

Pumps bowls shall be flanged, and free from sand and blow holes. The suction bell shall have a flared inlet with a grease packed lower bearing. It shall be fitted with guide vanes to minimize entrance losses. A sand cap shall be provided to prevent entrance of sand into the suction bell bearing. Suction bowls shall be provided without a strainer.

The discharge bowl shall be provided with a bearing immediately above the propeller and a connector bearing above the diffuser vanes. A discharge bowl bearing by-pass shall be provided in the bearing cavity for drainage and pressure relief.

Propellers shall be statically and dynamically balanced.

Pump shaft shall be 1.44" diameter. Propeller shall be attached to the pump shaft by longitudinal key ways and annular keyways fitted with snap rings to prevent axial movement.

Column and Bearing Retainer

Column shall be threaded, size 12" diameter, with butt joint connections weighing 43.77 lbs./ft. A 6 1/8" long sleeve type column coupling, with an O.D. of 13 7/8" shall be used to connect the column pieces. Non-revolvable lineshaft bearings pressed into stationary bearing retainers and clamped between column butt joint connections shall be provided.

Line Shaft (Open)

Line shaft shall be a minimum diameter of 1" size per ANSI - B 58.1 and shall provide satisfactory operation without excessive vibration or distortion and furnished in sections of uniform length not exceeding 10 feet. Bearings shall be lubricated with pump fluid. The lineshaft shall be coupled with threaded steel shaft couplings machined from solid bar stock. A replaceable lineshaft sleeve having a maximum diameter of 1 1/8" shall be provided at each lineshaft bearing journal.

Discharge and Packing Box

The discharge elbow shall be of the above ground configuration and shall

terminate in a 125 lb. ANSI cast iron flange with tapped holes. The pump mounting plate shall be 33 3/4" x 33 3/4" to cover an opening which will permit the withdrawal of the complete pump unit. Thickness shall be 1" and designed to adequately support the entire pump and assembly during operation. The discharge assembly shall have a 16" BD and be designed to provide a mounting surface for the electric motor as provided in "Electrical Equipment" of the standard specification. The assembly shall have adequate space for the maintenance of the shaft sealing arrangement. An open lineshaft packing box rated for a minimum working pressure of 175 PSI shall be provided. A packing box bushing, arranged for grease lubrication of the packing shall be provided. A packing gland shall be provided to compress packing. A shaft slinger shall be provided to prevent pumped fluid from traveling up the shaft into the driver.

#### 4. PUMP MATERIALS

All materials designated are ASTM unless otherwise noted and are for description of chemistry.

##### Bowl Assembly

<u>DESCRIPTION</u>	<u>MATERIAL</u>	<u>SPECIFICATION</u>
Snap Ring	Stainless Steel	A564-(632)
Column Pipe	Steel	A120
Shaft Coupling	Steel	AISI-C1215
Pump Shaft	416 Stainless Steel	A582-416
Discharge Bowl	Cast Iron	A48-CLASS 30
Discharge Bowl Bearing	Bronze	B505-(932)
Intermediate Bowl Bearing	Bronze	B505-(932)
Intermediate Bowl	Cast Iron	A48-CLASS 30
Cap Screw	Steel	SAE Bolt Steel
Nut	Steel	SAE Bolt Steel
Propeller	Bronze	B145-(836)
Suction Bell	Cast Iron	A48-CLASS 30
Suction Bell Bearing	Bronze	B505-(932)
Companion Flange	Cast Iron	A48-CLASS 30
Capscrew	Steel	SAE Bolt Steel
Nut	Steel	SAE Bolt Steel
Connector Bearing	Bronze	B505-(932)

##### Column and Lineshaft

<u>DESCRIPTION</u>	<u>MATERIAL</u>	<u>SPECIFICATION</u>
--------------------	-----------------	----------------------



Lineshaft	Steel	AISI-1045
Column	Steel	A120
Bearing Retainer	Bearing	B145-(836)
Lineshaft Bearing	Rubber	Neoprene
Snap Ring	Cadmium Plated Steel	SAE 1060-1090
Column Pipe	Steel	A 120
Lineshaft Sleeve	Stainless Steel	AISI-304
Tapered Bottom Column Pipe	Steel	A283-Grade D
Shaft Coupling	Steel	AISI-C1215
Pump Shaft	Stainless Steel	A582-416
Connector Bearing	Bronze	B505-(932)

Discharge and Packing Box

<u>DESCRIPTION</u>	<u>MATERIAL</u>	<u>SPECIFICATION</u>
Adjusting Nut	Steel	A108-12L14
Water Slinger	Rubber	Neoprene
Above Ground Discharge Head	Cast Iron	A48-CLASS 30
Pipe Plug	Cast Iron	A48-CLASS 30
Gland Stud	Brass	Common Bolt Brass
Gland Nut	Brass	Common Bolt Brass
Packing Box Gland	Bronze	B145-(836)
Packing Box Gasket	Tag Board	D1170-G3111
Top Shaft Sleeve	Stainless Steel	AISI-304
Packing	Graphite Filled Asbestos	
Column Flange Gasket	Tag Board	D1170-G3111
Packing Box	Cast Iron	A48-CLASS 30
Packing Box Bushing	Bronze	B505-(932)
Top Column Flange	Cast Iron	A48-CLASS 30
Top Shaft	Steel	AISI-1045
Top Column	Steel	A120
Top Enclosing Tube Bearing	Bronze	B145-(836)
Top Enclosing Tube	Steel	A120

Underground Elbow	Steel	A283-Grade D, A120
Enclosing Tube Adapter	Cast Iron	A48-CLASS 30
Pedestral	Steel	A283-Grade D, A120
Enclosing Tube Tension Nut	Bronze	B145-(836)
Base Plate	Steel	A283-Grade D
Motor Adapter Plate	Steel	A283-Grade D

5. OPERATING CONDITIONS

At Wet Well Water Surface Elevation of 14.0

4100 GPM @ 11.0' TDH\* with 65% efficiency

At wet well water surface elevation 8.0  
3750 GPM @ 16.0' TDH\* with 74% efficiency

\*TDH does not include losses for

- (1) 10 feet of column pipe
- (2) Discharge elbow
- (3) Mechanical friction of 10' of lineshaft

6. OPERATION OF PUMPS

General

Control panel and liquid level sensors shall be in accordance with "Electrical Materials" in the standard specification.

Pump Sequence

<u>Water Surface Elevation</u>	<u>Pumping Status</u>
7.0	All Pumps off
9.0	Submersible on
12.0	Submersible off and lead on
14.0	Lag on and alarm on

7. - WARRANTY

The pump manufacturer shall provide the City with a written one year warranty against defective pump and assembly.

8. - MANUAL

The pump supplier or manufacturer shall provide five copies of an operations manual for the pumps. Each manual shall include but not be limited to the following items:

- a. Certified pump curve for each pump
- b. Parts and assembly diagram with part numbers for ordering
- c. Maintenance schedule and procedures
- d. General operations

9. - MEASUREMENT AND PAYMENT

Measurement for propeller pumps shall be made as a lump sum and shall include but not be limited to all three propeller pumps and assembly complete in place.

Payment shall be made at the unit price bid and shall fully compensate the Contractor for all equipment, labor, materials, and incidentals required for furnishing and installing pumps and assembly.

**SECTION 151640  
SUBMERSIBLE GRINDER PUMPS FOR WASTEWATER  
(LESS THAN 10 HORSEPOWER)**

1. DESCRIPTION

This specification shall govern all work necessary for furnishing, installing, and placing into operation, heavy duty submersible grinder pumps capable of grinding sewage into a finely ground slurry for ease in pumping.

2. GENERAL

Pumps shall be designed and constructed to grind and pump raw unscreened sanitary sewage without clogging. Design of wetwell systems shall facilitate removal and inspection of pumps. Lifting cables shall be provided and installed for each pump. Pumps shall be designed, built and installed in accordance with best available technology and practice, and shall operate satisfactorily when installed. Each pump unit, with its appurtenances, shall be capable of continuous duty underwater without loss of watertight integrity to a depth of 65 feet.

3. WARRANTY

The pump manufacturer shall furnish the City with a written guarantee to warrant pumps and components against failure due to defective materials and workmanship for a period of 5 years after full operation and acceptance by the City. The warranty shall include 100% coverage of manufacturers shop labor and parts for the first year then 50% coverage through the 5th year. Pumps repaired under warranty shall be returned to the City's Wastewater Department with freight prepaid.

4. QUALIFICATIONS OF BIDDERS

The submersible pumps and accessories, shall be furnished by a single manufacturer/supplier who is fully experienced, reputable and qualified in the manufacture of the pumps to be furnished. The manufacturer/supplier shall also maintain provisions for providing parts and/or service within 48 hours of notification by the owner.

5. MATERIALS

A. General:

Major parts including lifting cover, stator casting, volute, and impeller shall be ASTM 48, Class 30 gray cast iron. All nuts, bolts, washers, and fastenings shall be of 316 stainless steel. All metal surfaces other than stainless steel or brass coming into contact with wastewater shall be protected with a coating of rubber-asphalt paint, or other water proof coating approved by the Engineer.

B. Power Cable:

The motor power cable shall consist of well insulated cable with a double jacketed system, Hypolon outside, synthetic rubber inside, exceeding industry standards for oil, gas, and sewage resistance, and shall be permanently marked with the indicated code. Sizing shall conform to NEC and ICEA specifications for pump motors. Each pump shall be installed with a sufficiently long power cable to suit the installation as shown on the drawings without splicing.

C. Power Cable Entry:

The cable entry seal shall insure a watertight and submersible seal. The cable entry shall be comprised of a single cylindrical elastomer grommet flanked by a stainless steel washer, all having close tolerance fit against the cable and compressed by the entire body, containing a strain relief function, separate from the function of sealing. A separate junction chamber shall provide for connection of the cable to the stator power leads. The junction chamber shall be separated from the motor stator housing by a terminal board which is bolted to a machined surface using an O-ring seal. Stator leads shall also be sealed to prevent moisture from entering the motor interior. Epoxies, silicones, or other secondary sealing systems shall not be considered acceptable.

D. Impeller and Grinding System:

The grinding system shall consist of a rotating cutter of chrome alloyed cast iron and a stationary cutter of 316 "L" hardened stainless steel. Cutting systems with plastic components or coatings shall be unacceptable.

The impeller shall be of the multi-vane, semi-open type of cast iron ASTM A 48-76 Class 30B, and shall be fastened to the pump-motor shaft by a tapered collet and locking screw. All mating surfaces of the pump and motor housings shall be machined and fitted with nitrile o-rings where watertight sealing is required. Machining and fitting shall be such that sealing is accomplished by controlled compression of the o-rings without the requirement of specific torque limits to achieve compression. Rectangular cross sectioned gaskets requiring specific torque limits to achieve compression shall not be considered adequate nor equal.

E. Bearings:

Pumps shall be equipped with two permanently lubricated bearings, one upper and one lower. The upper shall restrain radial thrust and be of the single row ball type. The lower shall consist of a two row angular contact ball bearing. Bearings shall have a minimum design life of 40,000 hours.

F. Shaft:

The shaft shall be of one piece design and extend through the pump and motor. The shaft shall be constructed of stainless steel.

G. Shaft Seals:

Each pump shall be provided with a tandem mechanical shaft seal system. The upper of the tandem set of seals shall operate in an oil chamber. The upper seal shall contain one stationary carbon ring and one positively rotating ceramic ring. The lower of the tandem set of seals shall consist of a stationary ring and a positively driven rotating ring. Both rings shall be constructed of ceramic on pumps smaller than 3.0 horsepower. On pumps of 3.0 horsepower and larger, the stationary ring shall be constructed of ceramic and the rotating ring constructed of tungsten carbide.

H. Motor:

The pump motor shall be integral to the pump for submersible or dry well operation. The motor shall be a squirrel cage induction type with class F insulation, NEMA B design, with Class H slot liners and a service factor of 1.15 or above. The stator shall be triple dipped in epoxy enamel or varnish to withstand a heat rise of 155° C as defined in NEMA standard MG-1. The NEMA starting code shall be F or less. The motor shall be statically and dynamically balanced. The motor shall be designed for continuous operation at 40° C ambient air temperature and be capable of up to 10 starts per hour. The pump motor(s) shall be furnished for operation with 230 volts, 1 phase, 60 hertz power supply.

- I. Motor Overload Protection:  
Motors shall have a forced convection type of cooling system. In addition, thermal radiators (cooling fins), integral to the stator housing, shall be adequate to provide the cooling required by the motor at the maximum rated power of this unit. A minimum of two thermal sensors shall be imbedded in the stator winding and coils. The thermal sensors shall be wired to the control panel and wired in series so that the opening of either sensor will cause the motor to shut down. Thermal sensors and controls which average the temperature across the phases of the winding and coils will not be acceptable. Stator temperature sensor switches shall stop the motor when the stator temperature exceeds 155° C. The motor shall resume operation when the stator cools down to 150° C.
- J. General Accessories:  
Pump accessories, controls, hardware, etc. shall be furnished by the pump manufacturer. The pump manufacturer shall be responsible for the coordination and compatibility of all accessories. The accessories shall be warranted against defects and corrosion by the manufacturer for five years after final acceptance of the project.
- K. Lifting Cable:  
A lifting cable assembly shall be provided and installed for each pump. The cable and shackle shall be of 304 stainless steel and have a minimum working load of twice the pump weight. The cable shall be secured to the pump with the shackle and to the access cover with a hook. A four foot length of excess cable shall be suspended at the hook to facilitate the lifting of the pump.
- L. Access Covers:  
Access covers and frames shall be of aluminum. The door panels shall be diamond plate finish and designed to withstand a live load of 300 lbs per square foot. The door shall be provided with stainless steel hinges with tamperproof fasteners. All hardware shall be stainless steel. The door shall close flush with the top of the frame and shall have lockable hardware installed.
- M. Float Cable Rack:  
A cable rack fabricated of type 304 stainless steel shall be provided and attached to the access cover frame. The rack shall have provisions for holding in place and supporting the level control float cables.
- N. Power Cable Supports:  
Stainless steel power cable supports (Kellums Grip) shall be used for all power cables. The supports shall be attached to eye bolts bolted into the side of the access opening, or other support approved by the Engineer. Supporting the power cables on the cable rack will not be acceptable.
- O. Hardware:  
All nuts, bolts, anchor bolts, wedge anchors, and other hardware (including nuts and bolts for pipe fittings) shall be minimum grade type 304 stainless steel.
- P. Electrical Pump Controls:  
The electrical control panels for the pump(s) shall be supplied to the Contractor by the pump supplier to assure component compatibility. The pump supplier and Contractor shall provide for proper control operation and protection. The control panel shall be factory wired and tested prior to shipment. The control panel shall include but is not limited to the following:

1. Incoming power, neutral, and ground lug connections
2. Thermal magnetic circuit breakers for motor and control circuits
3. Magnetic starters with overload protection for each motor phase with manual reset
4. Magnetic starter shall meet NEMA requirements and shall be sized as required for the motor horsepower
5. 115 volt control power
6. Hand-off-automatic (HOA) selector switches with red running lights
7. High level alarm light, weatherproof, vaportight, with red globe, 100 watt
8. Run time meter for each pump
9. Space heater with thermostat and on/off switch
10. Terminal blocks as required for connection of pump and level sensor cables

Q. Enclosure:

All components shall be housed in a NEMA 3R fiberglass enclosure. The enclosure shall have a minimum of two stainless steel latches. A stainless steel piano hinge shall extend the full length of one side of the enclosure door. The enclosure shall be provided with pad-locking capability. Enclosures shall be mounted as shown in the plans or as called for elsewhere in the specifications.

R. Float Switches:

Float switches installed for the grinder pump systems shall consist of epoxy encapsulated, single pole, heavy duty, mercury tilt switches housed in a non-corrosive PVC float body. The float switches shall be internally weighted and wired directly into the pump control panel. They shall also be UL listed and CSA certified.

6. PRECONSTRUCTION SUBMITTALS

A. Pump Data:

The Contractor shall furnish certified pump curves showing the results of test pumping units of identical design, size, and horsepower as those to be furnished. Catalog curves are not acceptable. Graphs shall include:

1. Pump Curve with Q in GPM and H in feet
2. Power input curve in kilowatts
3. Efficiency curve (including motor), wire to water
4. N.P.S.H. curve
5. Pump model, impeller/grinder model, serial numbers
6. Motor rated horsepower and voltage

7. Date and location of test
  8. Customer for whom test was performed
  9. Data in English units
  10. NEC Code letter
- B. Parts List and Specifications:  
A comprehensive list of all station accessories and pump components, listing material type shall be submitted for the Engineer's review and approval.
- C. Shop Drawings:  
Shop drawings of station accessories and pump components and connections shall be submitted for the Engineer's review and approval.
- D. Supplemental Construction Details:  
The construction drawings depict the approximate locations of pumps and access covers. Supplemental drawings depicting the precise locations of anchor bolts, pump mounting systems, access covers, etc. will be required for the type of pump to be used. These supplemental drawings shall be prepared by the pump supplier and submitted by the Contractor to the Engineer for documentation of the project. The supplier shall be responsible for completeness and accuracy of shop drawings and any applicable revisions, as required to successfully complete the construction.
- E. Wiring Diagrams:  
Wiring diagrams shall also be prepared and submitted by the Contractor/Supplier to the Engineer for review and project documentation.

#### 7. PUMP OPERATING CONDITIONS

The proposed pump installation shall be designed to operate at approximately 40 GPM and 73 feet of head, and approximate the characteristics of the Flygt model M-3085 pump with 23 horsepower motor in 1 phase, 230 volt operation, and No. 257 (high head) impeller.

#### 8. CONSTRUCTION METHODS

- A. Delivery and Storage of Materials:  
Parts and equipment shall be properly protected so that no damage or deterioration will occur during transport or storage. Factory assembled components shall not be dismantled, unless done so under the supervision of an authorized pump manufacturer representative.
- B. Installation:  
Installation of the pumps shall be in strict accordance with the manufacturer's instructions and recommendations. The location of the discharge piping is shown on the construction drawings. The location of the pumps, access covers, and discharge connection are approximate. The precise placement and alignment of anchor bolts, discharge assemblies, access covers, etc., shall be in accordance with supplemental construction details provided by the pump manufacturer.
- C. Installation Inspection:  
Prior to completing installation (but after wiring of the pump(s)), the Contractor shall:
1. Megger pump motor stator and power cables



2. Check seal lubrication
  3. Verify proper pump rotation
  4. Check power supply voltage
  5. Measure pump motor no load current
- D. Operating Check:  
After initial inspection the Contractor shall lower the pump(s) into pumping position and confirm proper alignment and connection. The Contractor shall then perform an initial operation check of each pump including:
1. Motor current with discharge valve closed
  2. Motor current with discharge valve open
  3. Power supply voltage with pump(s) running
  4. Vibration
  5. Check level control and sequence

#### 9. FINAL SUBMITTALS

- A. Inspection Report:  
The results of the Installation Inspection and Operating Check shall be submitted as a written report of findings and data determined with regard to the pumps, motors, level controls, sequences, accessories, electrical, etc. The report shall be prepared by the Contractor/Supplier and three copies submitted to the Engineer for review and approval.
- B. Operation and Maintenance Manual:  
The Operation and Maintenance Manual shall be included with the Inspection Report with one manual for each of the three copies of the report. The O & M manual shall include a minimum of the following:
1. Service location & phone number
  2. Fact sheet with pump data such as serial number and pump curves
  3. Maintenance instructions and schedule
  4. Shop service manual
  5. Assembly manual showing all parts by catalog number

#### 10. MEASUREMENT AND PAYMENT

Submersible Grinder Pumps and accessories shall not be measured and paid for directly, but shall be considered subsidiary to the various other bid items unless indicated otherwise in the Contract Documents or Plan Details.

SECTION 161001  
ELECTRICAL MATERIALS (S-18)

1. DESCRIPTION

This specification shall govern all work required for furnishing and installing electrical equipment required to complete the project.

2. GENERAL

The contractor shall install electrical equipment in accordance with the National Electric Code Requirements.

The contractor may incorporate existing electrical control panel, conduit and other electrical materials into the project provided that it is in compliance with the drawings and approved by the Engineer.

The contractor may substitute materials of equal or superior quality provided that they are approved by the Engineer.

Motors

Each of the three pumps shall be driven by a vertical hollow shaft 25 HP, 1800 RPM Motor of squirrel cage, induction, normal starting torque, low starting current type of NEMA Design B. Each shall be of the weatherproof type with Class A-1 insulation and provided with non-reverse ratchets. Each motor shall be provided with strip heaters suitable for 120 volt single phase current. All name plates shall be of stainless steel. The motor shall be designed for operation on three phase, sixty hertz, 480 volt power. Motor shall be totally enclosed, fan cooled.

3. MEASUREMENT AND PAYMENT

Measurement shall be made as a lump sum for all electrical equipment furnished and installed by the contractor.

Payment shall fully compensate the contractor for all materials supplied and incidental storage and handling.

AUTHORIZATION FOR INSPECTION

\_\_\_\_\_ Subdivision  
Street Address \_\_\_\_\_ Lot \_\_\_\_\_ Block \_\_\_\_\_  
Do you own this property: Yes \_\_\_\_\_ No \_\_\_\_\_  
\_\_\_\_\_ Last Name \_\_\_\_\_ First \_\_\_\_\_ Initial \_\_\_\_\_

\_\_\_\_\_ Mailing Address (If different from above)

\_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

\_\_\_\_\_ Business Phone \_\_\_\_\_ Home Phone \_\_\_\_\_

I hereby authorize the City and its representatives to enter upon my property for the purpose of investigating private water and sewer service.

\_\_\_\_\_ Owner's Signature \_\_\_\_\_ Date \_\_\_\_\_

or

\_\_\_\_\_ Authorized Agent's Signature \_\_\_\_\_ Date \_\_\_\_\_

Tenants Name (Print) and Phone Number (If Applicable)

PRIVATE WATER SERVICE  
INSPECTION REPORT & ROUTING RECOMMENDATION

Address of structure:

Subd.: \_\_\_\_\_ Lot: \_\_\_\_\_ Blk:

Owner's Name: \_\_\_\_\_ Mail Add.:

Home Phone: \_\_\_\_\_ Office Phone:

Building Permit Number:

Site investigated by: \_\_\_\_\_ (For Contractor)  
on \_\_\_\_\_ (date).

THE CONTRACTOR SHALL PROVIDE A SITE PLAN FOR EACH PRIVATE WATER SERVICE AND THE SITE PLAN SHALL BE AN ATTACHMENT OF THIS EXHIBIT AND SHOW THE FOLLOWING INFORMATION:

1. Each Building on lot(s)
2. Purpose of building (residence, garage, storage, ...)
3. Type of structure: (wood frame, masonry, steel, ...)
4. Type of veneer or siding: (brick, metal, asbestos, ...)
5. Type of foundation: (slab on grade with beams, piers, ...)
6. Route of existing service line (from structure to main)
7. Location of existing meter.
8. Type, size and condition of existing pipe at proposed point of connection.
9. Route of proposed private service.
10. Proposed fittings (bends, meter, ...)
11. Other obstacles along proposed route: (driveway, trees,)
12. Scale & North arrow.

CONTRACTOR S AND PLUMBER'S COMMENTS:

THE PROPOSED ROUTE OF THE PRIVATE WATER PER PLUMBER.

Recommended by: \_\_\_\_\_ Date: \_\_\_\_\_  
(Plumber / Lisc. Number)

CITY'S COMMENTS:

Reviewed and Authorized for Construction By:

City Plumbing Inspector: \_\_\_\_\_ Date:

City Eng. Inspector: \_\_\_\_\_ Date:

Owner's Signature: \_\_\_\_\_ Date:

Copy: Owner, City Engineering Dept., Water Dept.

PRIVATE SANITARY SEWER SERVICE  
INSPECTION REPORT & ROUTING RECOMMENDATION

Address of structure:

Subd.: \_\_\_\_\_ Lot: \_\_\_\_\_ Blk:

Owner's Name: \_\_\_\_\_ Mail Add.:

Home Phone: \_\_\_\_\_ Office Phone:

Building Permit Number:

Site investigated by: \_\_\_\_\_ (For Contractor)

on \_\_\_\_\_ (date).

THE CONTRACTOR SHALL PROVIDE A SITE PLAN FOR EACH PRIVATE SANITARY SERVICE AND THE SITE PLAN SHALL BE AN ATTACHMENT OF THIS EXHIBIT AND SHOW THE FOLLOWING INFORMATION:

1. Each Building on lot(s)
2. Purpose of building (residence, garage, storage, ...)
3. Type of structure: (wood frame, masonry, steel, ...)
4. Type of veneer or siding: (brick, metal, asbestos, ...)
5. Type of foundation: (slab on grade with beams, piers, ...)
6. Route of existing service line (from structure to main)
7. Location of existing clean-outs.
8. Flowline, type, size and condition of existing pipe at proposed point of connection.
9. Route of proposed private service.
10. Proposed fittings (bends, clean-outs, ...)
11. Other obstacles along proposed route: (driveway, trees,)
12. Scale & North arrow.

CONTRACTOR'S AND PLUMBER'S COMMENTS:

THE PROPOSED ROUTE OF THE PRIVATE SEWER PER PLUMBER.

Recommended by: \_\_\_\_\_ Date:  
(Plumber / Lisc. Number)

CITY'S COMMENTS:

Reviewed and Authorized for Construction By:

City Plumbing Inspector: \_\_\_\_\_ Date:

City Eng. Inspector: \_\_\_\_\_ Date:

Owner's Signature: \_\_\_\_\_ Date:

Copy: Owner, City Engineering Dept., Wastewater Dept.