

APPENDIX 2
STANDARD
DRAWING SHEETS

CALL BEFORE YOU DIG!



PARTICIPANTS REQUEST
48 HOURS NOTICE BEFORE YOU DIG,
DRILL, OR BLAST - STOP AND CALL
811

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

SHEET INDEX	
SHEET NO.	DESCRIPTION
1.	TITLE SHEET

CONSULTANT'S SHEET
PROJECT NO.

DESCRIPTION

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

DESCRIPTION

BY

DATE

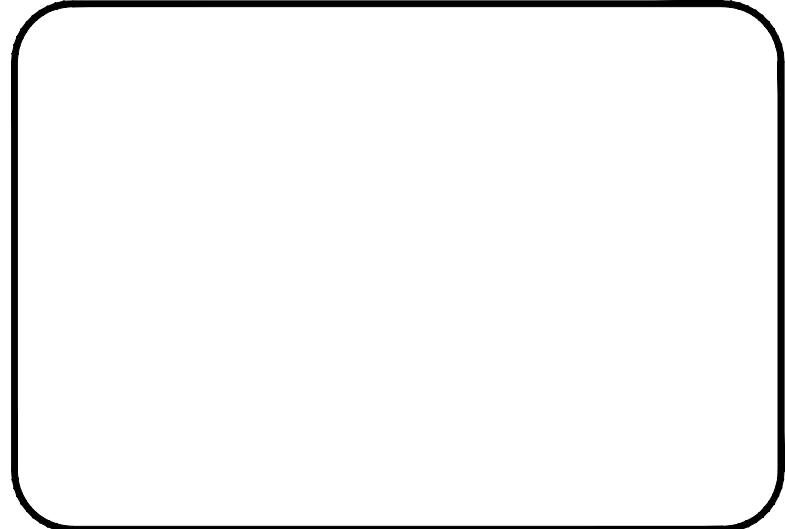
REVISION NO.

CITY PROJECT #

SHEET . of .
RECORD DRAWING NO.

TITLE SHEET

PROJECT LOCATION
PHYSICAL ADDRESS
CORPUS CHRISTI, TEXAS _____



VICINITY MAP

San Patricio County

Nueces County

CORPUS CHRISTI BAY

MADRE

LAGUNA

GULF OF MEXICO

PLANS FOR
PROJECT NAME

PROJECT # _____

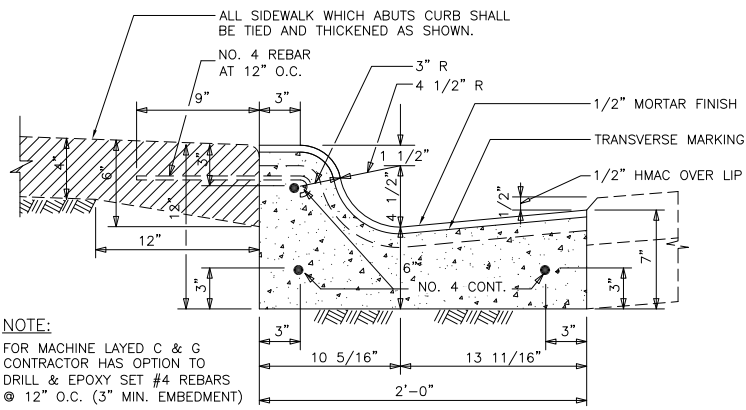
PREPARED BY _____

[CONSULTANT'S NAME, ADDRESS, AND PHONE]

RELEASED FOR
CONSTRUCTION:

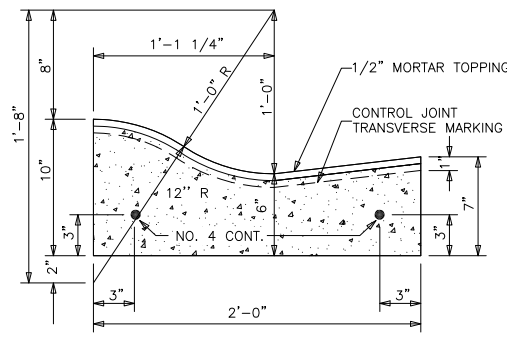
Director of Engineering Services

Date



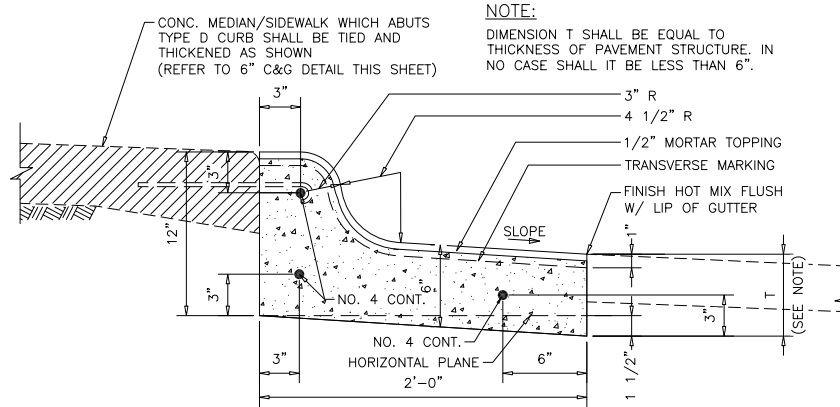
TYPICAL 6" CURB & GUTTER DETAIL

NOT TO SCALE



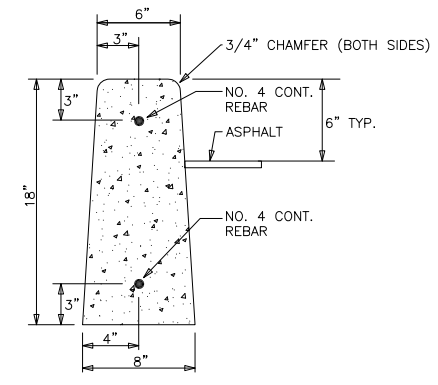
4" CURB & GUTTER DETAIL

NOT TO SCALE



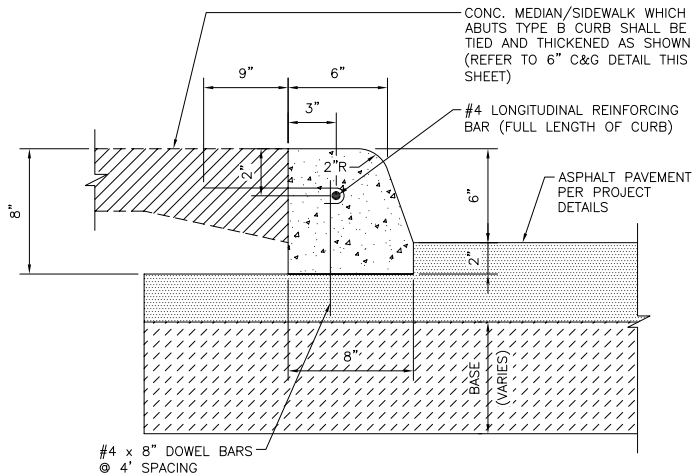
6" REVERSE CURB & GUTTER DETAIL

NOT TO SCALE



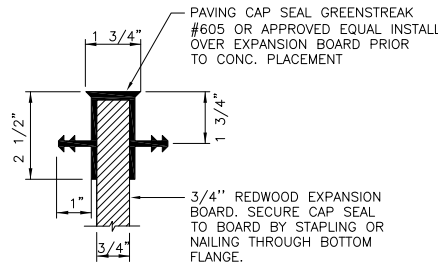
TYPE 'A' HEADER CURB DETAIL

NOT TO SCALE



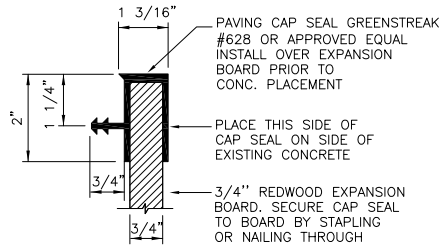
TYPE 'B' HEADER CURB DETAIL

NOT TO SCALE



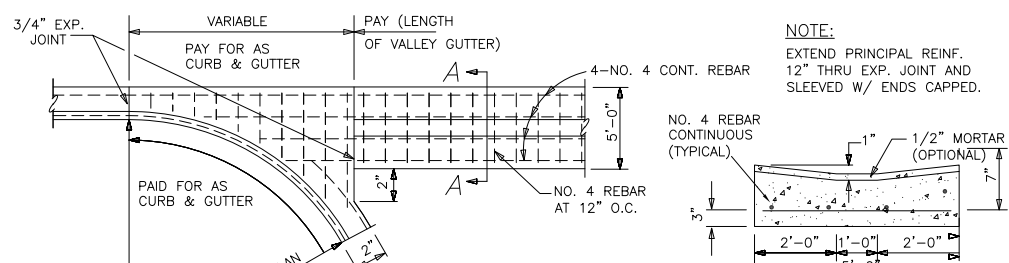
CAP SEAL DETAIL NEW CONC. TO NEW CONC.

NOT TO SCALE



CAP SEAL DETAIL NEW CONC. TO EXIST. CONC.

NOT TO SCALE



5" VALLEY GUTTER DETAIL

NOT TO SCALE

NOTE: EXTEND PRINCIPAL REINF. 12" THRU EXP. JOINT AND SLEEVED W/ ENDS CAPPED.

VALLEY GUTTER NOTE:

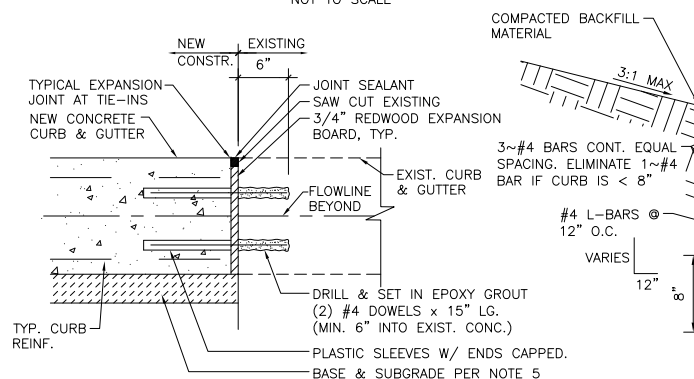
- USE OF VALLEY GUTTERS ON CITY STREETS ARE NOT ALLOWED PER CITY STANDARDS. THIS DETAIL IS INCLUDED ONLY FOR ISOLATED OR TEMPORARY USE IN LOCATIONS WHERE NO OTHER DRAINAGE OPTIONS EXIST, AND SHALL ONLY BE USED WITH PRIOR APPROVAL FROM THE CITY.

CURB & GUTTER AND HEADER CURB NOTES:

- ALL CONCRETE CLASS "A" 3,000 P.S.I. ALL STEEL GRADE 60 fy = 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 NO. 4 DOWELS X 15" LONG SPACED AS INDICATED. THE NO. 4 DOWEL SHALL BE EXTENDED ACROSS THE JOINT 9 INCHES AND THIS END SHALL BE SLEEVED WITH ENDS CAPPED.
- WHERE NEW CURB & GUTTER OR HEADER CURB JOINS EXISTING CURB & GUTTER, TRANSITION THE LAST 10' OF THE NEW TO MATCH THE OLD IN SHAPE.
- BASE, SUB-BASE, AND SUBGRADE THICKNESS UNDER CONCRETE CURB AND GUTTER TO BE AS SPECIFIED IN THE PROJECT SPECIFICATIONS AND PROJECT DETAILS, PER LOADING DESIGN CONDITIONS. REFER TO THE PROJECT SPECIFIC STREET SECTION(S) AND RELATED PROJECT DETAILS SHOWN ON THE DRAWINGS. BOTH THE TREATED SUBGRADE (8" MINIMUM) AND THE FLEXIBLE BASE (4" MINIMUM) OR EQUIVALENT SHALL EXTEND A MINIMUM OF 1' BEYOND THE BACK OF CURB.
- TYPICAL 6" CURB & GUTTER DETAIL IS CITY STANDARD AND SHALL BE USED IN MOST CASES. DETAILS FOR 4" CURB & GUTTER, 6" REVERSE CURB & GUTTER, AND HEADER CURBS ARE SPECIALTY ITEMS AND ARE PROVIDED FOR USE AS NEEDED TO ADDRESS PROJECT SPECIFIC CONDITIONS. USE IS SUBJECT TO CITY APPROVAL.
- 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.
- AT LEAST 1' OF THE AREA BEHIND THE CURB SHALL BE BACKFILLED AND COMPACTED (MINIMUM 95% STANDARD PROCTOR DENSITY) IN ACCORDANCE WITH THE SPECIFICATIONS AS SOON AS POSSIBLE AND NO LATER THAN 48 HOURS OF REMOVAL OF FORMS (OR SOONER IN THE EVENT OF INCLEMENT WEATHER) IN ORDER TO PROTECT THE MOISTURE OF THE PAVEMENT STRUCTURE.

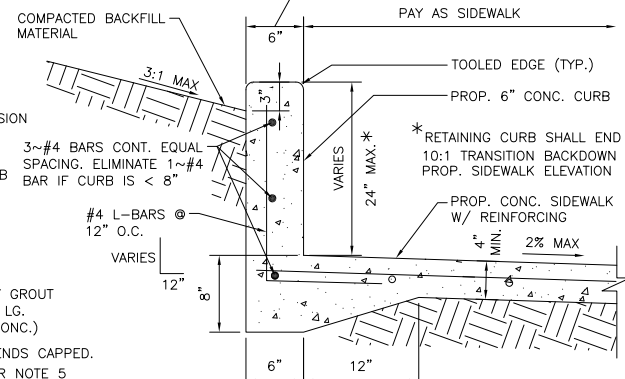
SIDEWALK NOTES:

- ALL EXPANSION JOINTS TO BE 3/4" REDWOOD EXPANSION BOARD, UNLESS OTHERWISE NOTED.
- ALL CONCRETE CLASS "A", 3,000 psi. ALL STEEL, GRADE 60, fy = 60,000 psi.
- CONCRETE TO RECEIVE BROOM FINISH.
- TRANSVERSE CONTRACTION JOINTS 1/8" WIDE BY 1/2" DEEP SHALL BE CUT IN ALL SIDEWALKS AT 5'-0" INTERVALS (TYPICAL) OR THE INTERVALS SHALL BE SPACED TO MATCH THE WIDTH OF THE SIDEWALK.



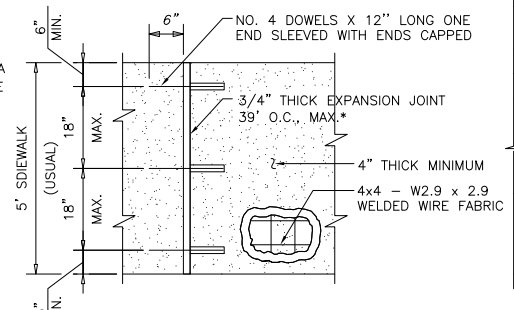
CURB AND GUTTER TIE-IN DETAIL

NOT TO SCALE



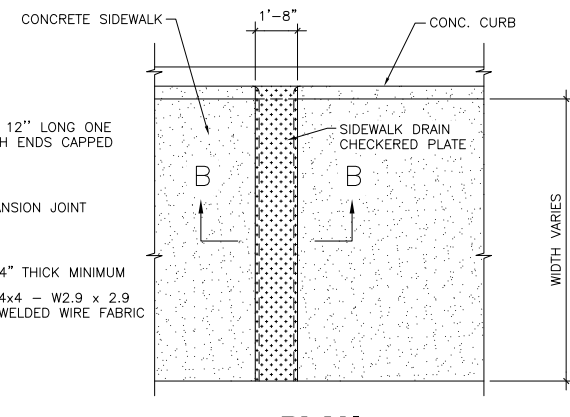
SIDEWALK RETAINING CURB DETAIL

NOT TO SCALE



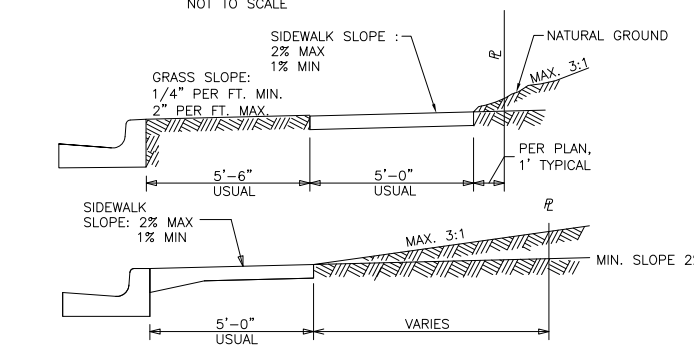
PLAN FOR SIDEWALK

NOT TO SCALE



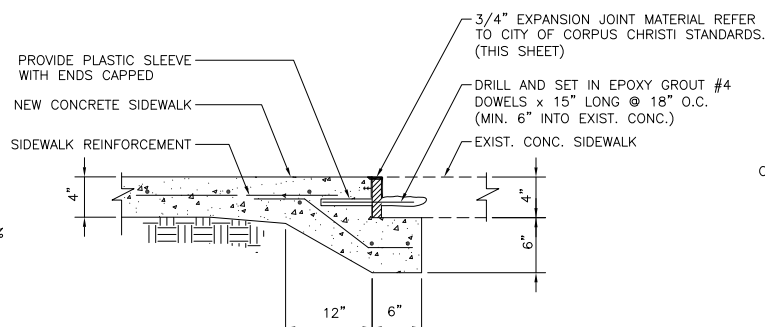
PLAN SIDEWALK DRAIN

NOT TO SCALE



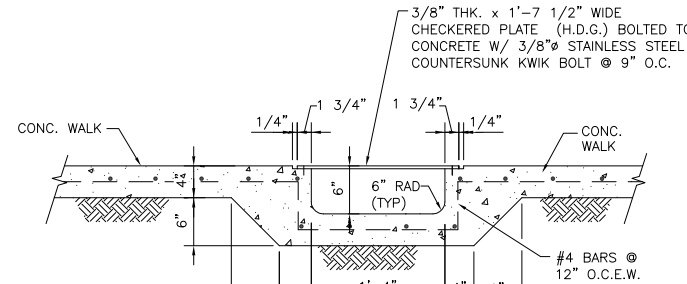
SURFACE & SIDEWALK SLOPE BEHIND CURB

NOT TO SCALE



NEW TO EXISTING SIDEWALK TIE-IN DETAIL

NOT TO SCALE



SECTION B-B

NOT TO SCALE

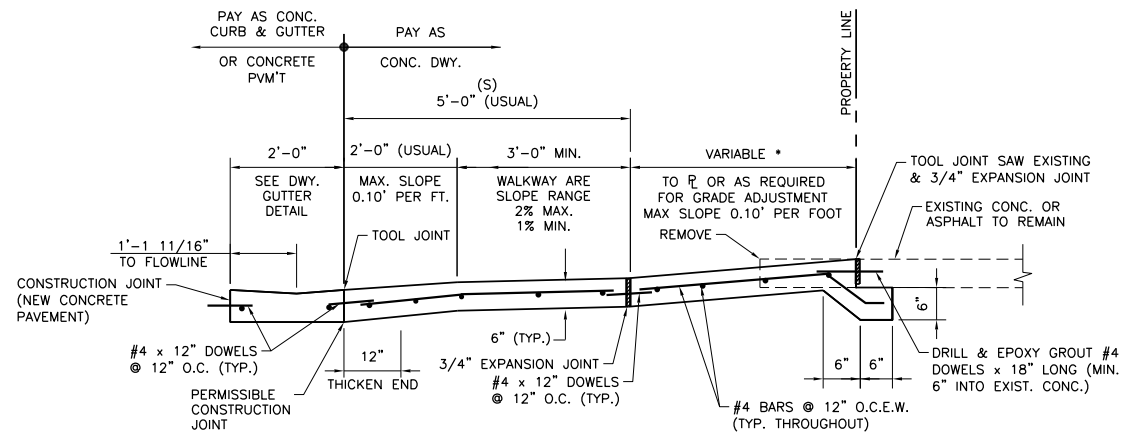
DESCRIPTION	BY	DATE	REVISION NO.
CITY OF CORPUS CHRISTI CURB, GUTTER AND SIDEWALK STANDARD DETAILS			

CITY OF CORPUS CHRISTI
TEXAS
Department of Engineering Services

CITY OF CORPUS CHRISTI
CURB, GUTTER AND SIDEWALK
STANDARD DETAILS

SHEET _____ of _____
RECORD DRAWING NO.
CITY PROJECT # _____

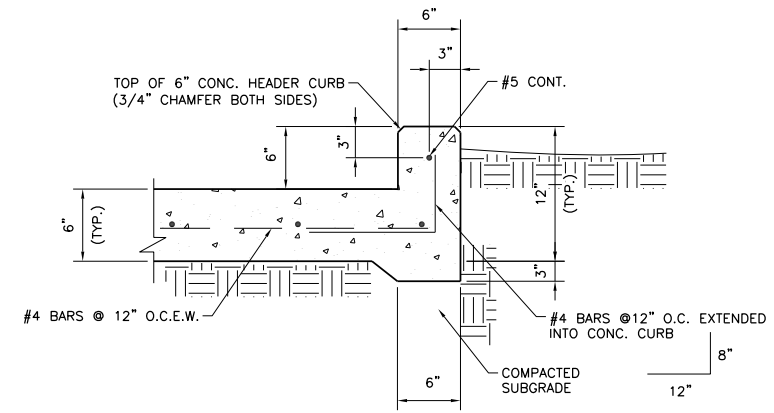
(2015 05 01)



**SECTION
DRIVEWAY WITH TIED SIDEWALK**

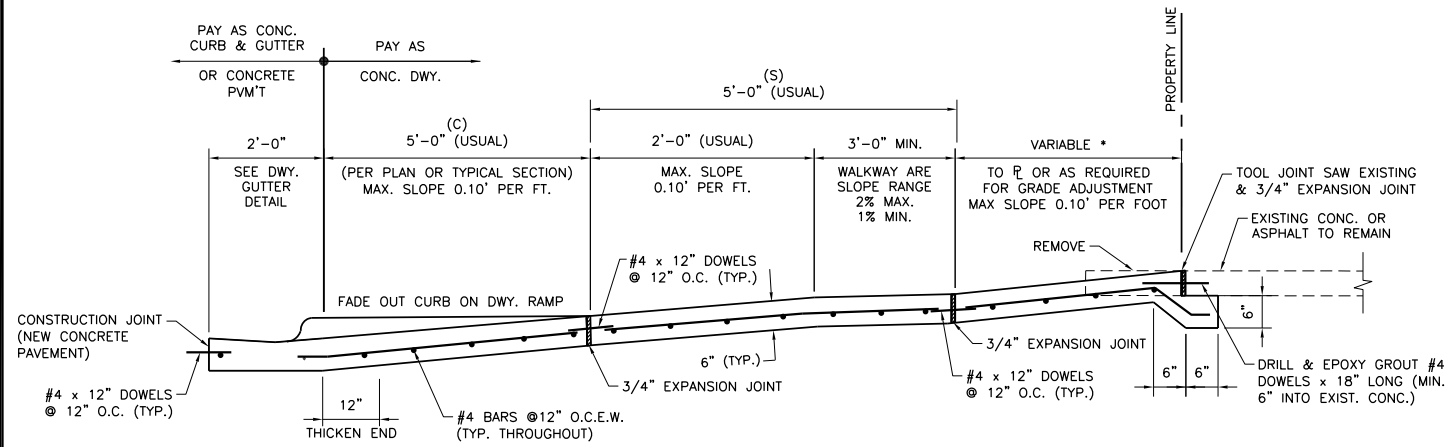
NOT TO SCALE

* DRIVEWAY IMPROVEMENTS MAY NEED TO EXTEND INTO PRIVATE PROPERTY TO ACHIEVE 10% MAXIMUM SLOPE.



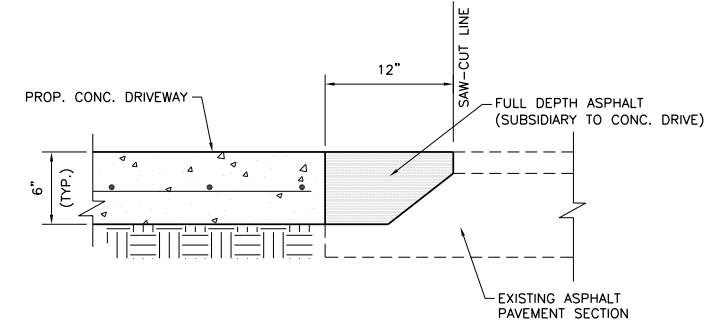
TYP. DRIVEWAY HEADER CURB DETAIL

NOT TO SCALE



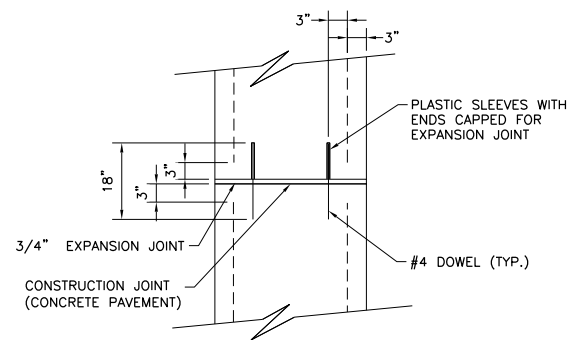
**SECTION
DRIVEWAY WITH DETACHED SIDEWALK**

NOT TO SCALE



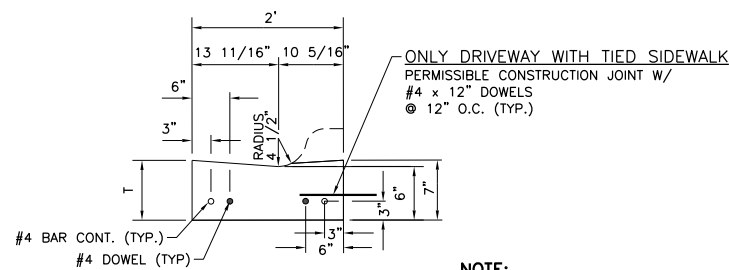
**CONC. DRIVEWAY TO
ASPHALT PAVEMENT TIE-IN DETAIL**

NOT TO SCALE



**PLAN
DRIVEWAY GUTTER**

NOT TO SCALE



**SECTION
DRIVEWAY GUTTER**

NOT TO SCALE

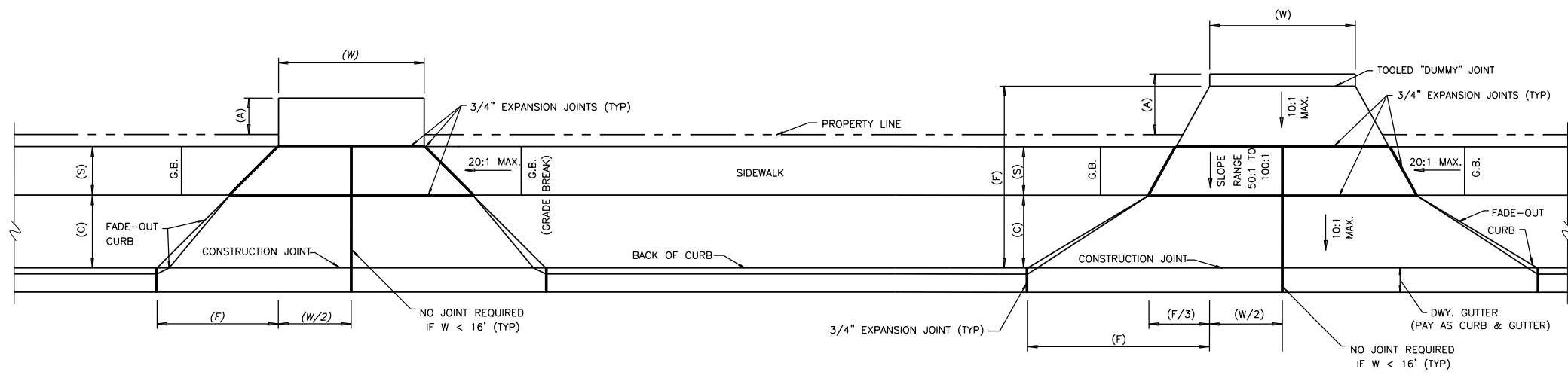
NOTE:
T = THICKNESS OF CONCRETE PAVEMENT OR CONCRETE CURB & GUTTER

REVISION NO.	DATE	BY	DESCRIPTION

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

**CITY OF CORPUS CHRISTI
DRIVEWAY STANDARD DETAILS**

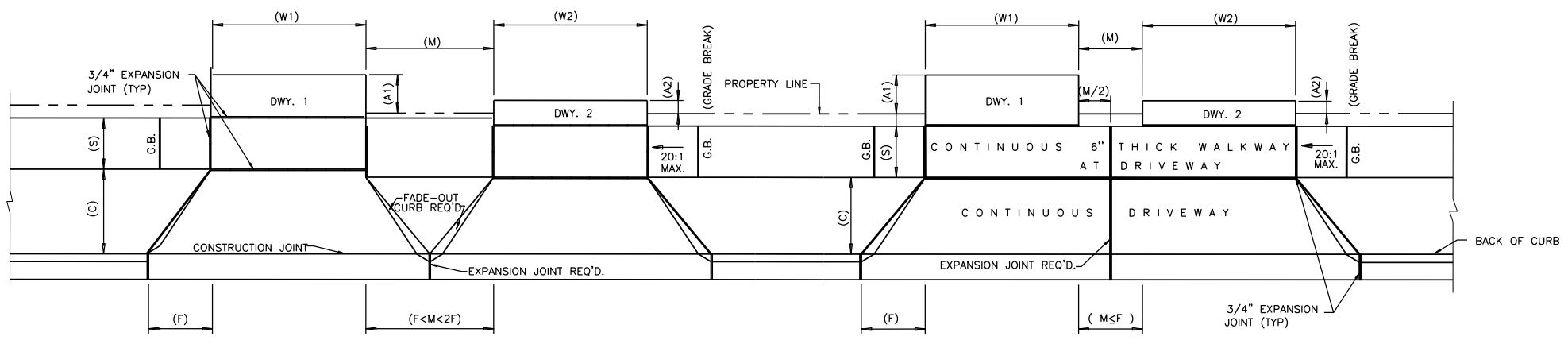
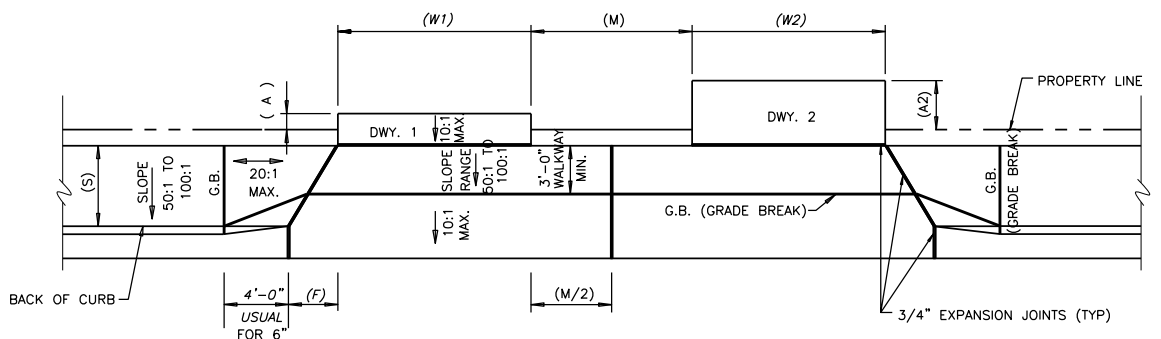
SHEET _____ of _____
RECORD DRAWING NO. _____
CITY PROJECT # _____



STANDARD DRIVEWAY DIMENSION			
DWY. TYPE	F ^a (FT.)	W ^b (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

^a VALUE OF F MAY BE CHANGED BY ENG.
^b 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

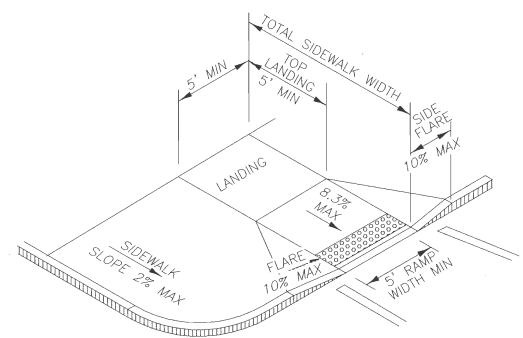
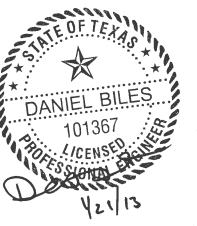


REVISION NO.	DATE	BY	DESCRIPTION

CITY OF CORPUS CHRISTI TEXAS
Department of Engineering Services

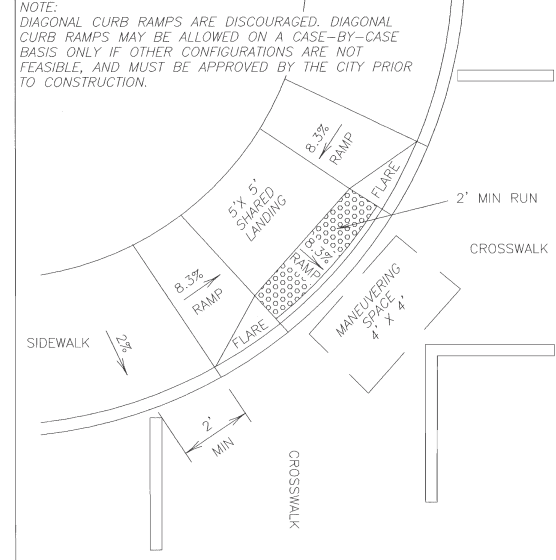
CITY OF CORPUS CHRISTI DRIVEWAY STANDARD DETAILS

SHEET _____ of _____
RECORD DRAWING NO. _____
CITY PROJECT # _____



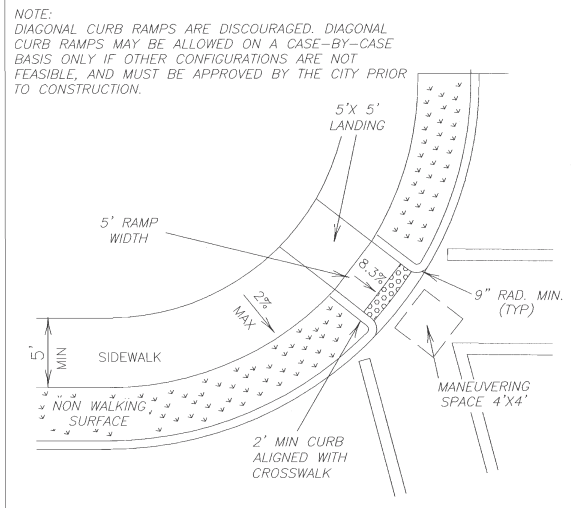
TYPE 1

PERPENDICULAR CURB RAMP
(SIDEWALK ADJACENT TO CURB)



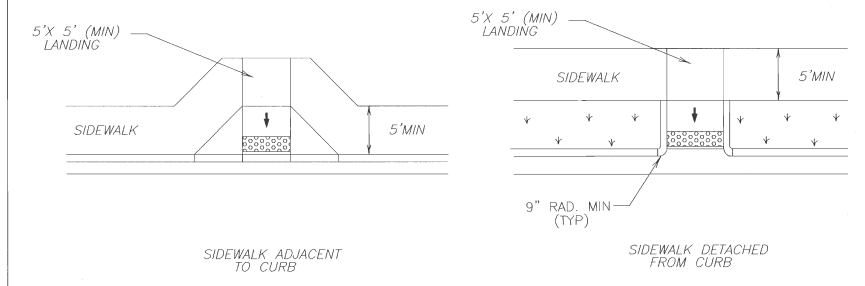
TYPE 4

DIAGONAL COMBINATION CURB RAMP
PERPENDICULAR TO THE TANGENT OF THE CURB
RADIUS AND CONTAINED IN CROSSWALK



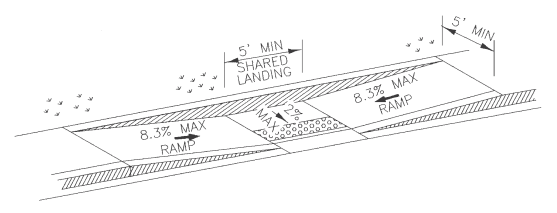
TYPE 7

DIAGONAL CURB RAMP
(RETURNED CURB)



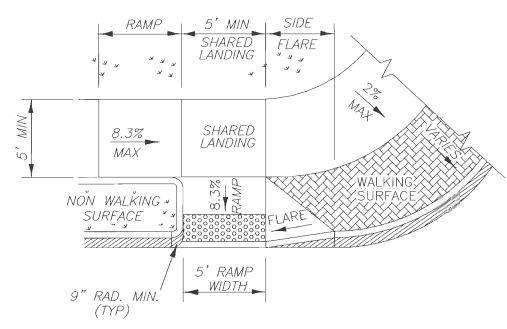
TYPE 10

CURB RAMP MID-BLOCK PLACEMENT
PERPENDICULAR RAMPS



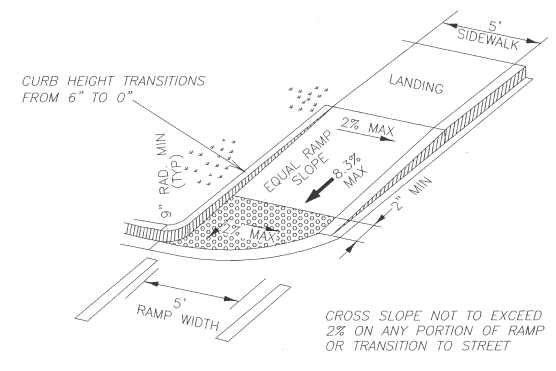
TYPE 2

PARALLEL CURB RAMP WITH
SIDEWALK ADJACENT TO CURB
(USE ONLY WHERE WATER WILL NOT POND IN THE LANDING)



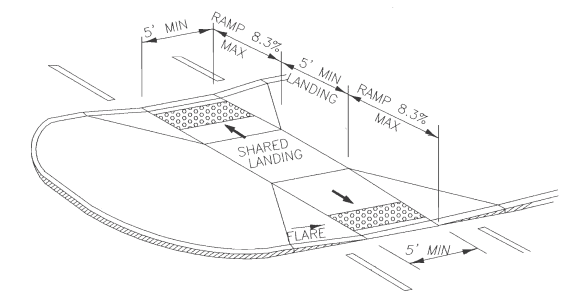
TYPE 5

COMBINATION CURB RAMP



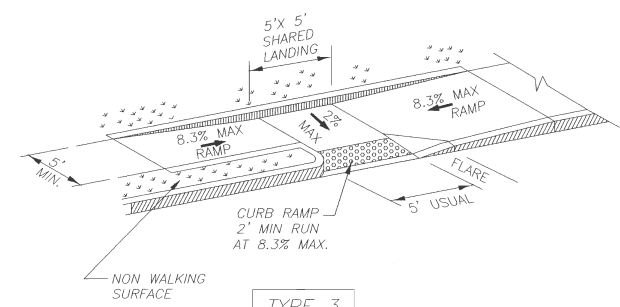
TYPE 8

DIRECTIONAL RAMP WITHIN RADIUS
(SIDEWALK ADJACENT TO CURB)



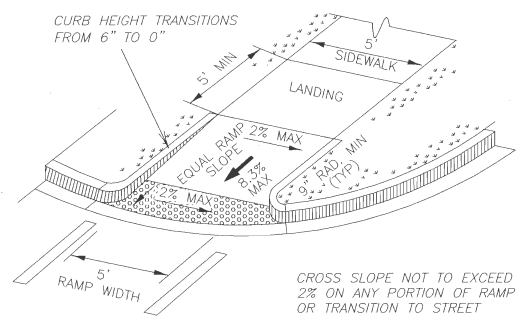
TYPE 11

CURB RAMPS AT MEDIAN ISLAND



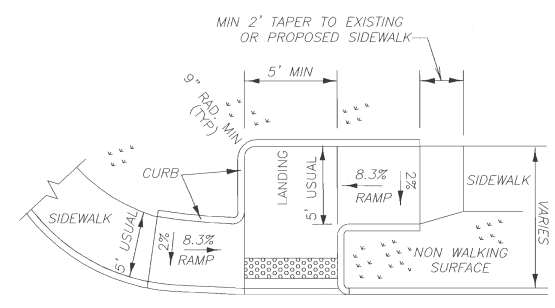
TYPE 3

PARALLEL CURB RAMP



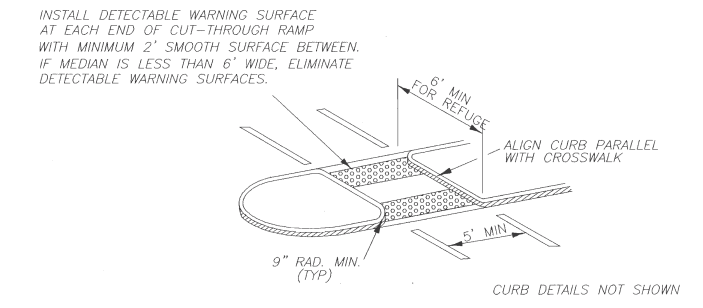
TYPE 6

DIRECTIONAL RAMP WITHIN RADIUS
(SIDEWALK SET BACK FROM CURB)



TYPE 9

OFFSET PARALLEL CURB RAMP



TYPE 12

FLUSH CURB RAMP AT MEDIAN ISLAND OPENING

DESCRIPTION

BY

DATE

REVISION NO.

DESCRIPTION

BY

DATE

REVISION NO.

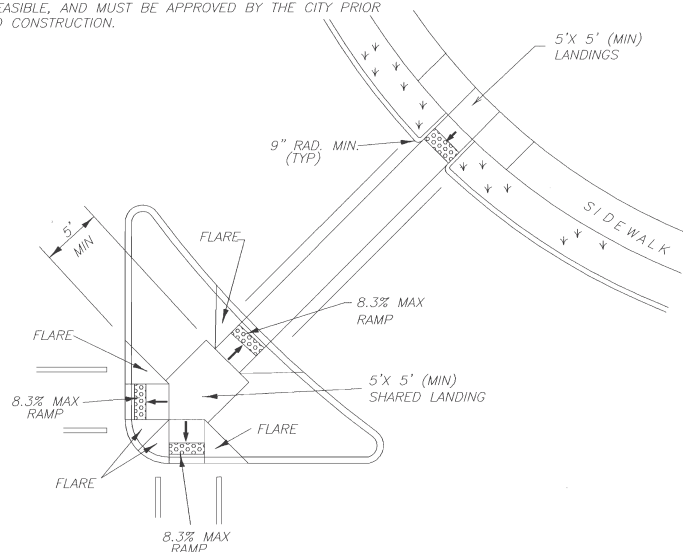
CITY OF
CORPUS CHRISTI
TEXAS
Department of Engineering Services

CITY OF CORPUS CHRISTI PEDESTRIAN
CURB RAMP STANDARDS 1 OF 4

SHEET ____ of ____
RECORD DRAWING NO.

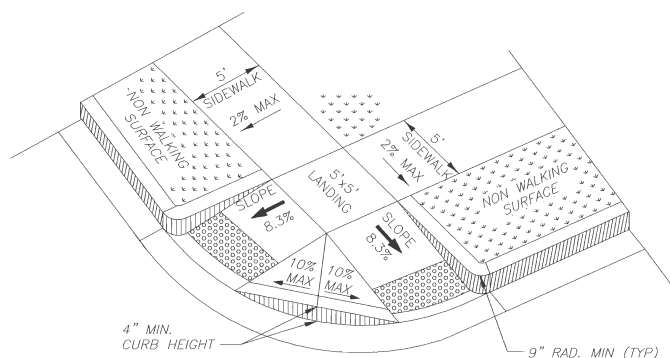
CITY PROJECT #

NOTE: DIAGONAL CURB RAMPS ARE DISCOURAGED. DIAGONAL CURB RAMPS MAY BE ALLOWED ON A CASE-BY-CASE BASIS ONLY IF OTHER CONFIGURATIONS ARE NOT FEASIBLE, AND MUST BE APPROVED BY THE CITY PRIOR TO CONSTRUCTION.



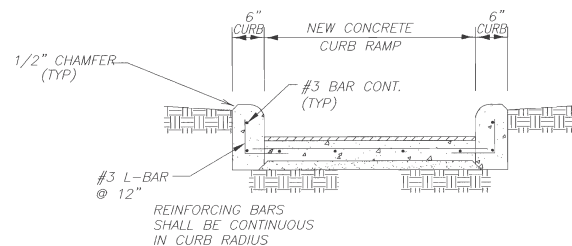
TYPE 13

AT INTERSECTION W/FREE RIGHT TURN & ISLAND COMBINATION ISLAND RAMPS



TYPE 14

PERPENDICULAR CURB RAMPS (BI-DIRECTIONAL)
(SIDEWALK SET BACK FROM CURB)



HEADER CURBS AT CURB RAMP

SUBGRADE PREPARATION:

1. SUBGRADE UNDER CONCRETE SIDEWALKS AND CURB RAMPS SHALL BE COMPACTED TO 95% STANDARD PROCTOR DENSITY.

SIDEWALK NOTES:

1. THE MINIMUM SIDEWALK WIDTH FOR ALL ARTERIAL AND COLLECTOR STREETS IS 5'. WHERE A 5' SIDEWALK CAN NOT BE PROVIDED DUE TO SITE CONSTRAINTS, A MINIMUM 4' SIDEWALK MAY BE PROVIDED. 5'X5' PASSING AREAS SHALL BE PROVIDED AT INTERVALS NOT TO EXCEED 200' FOR ALL SIDEWALKS LESS THAN 5' IN WIDTH.
2. MAXIMUM ALLOWABLE CROSS SLOPE ON SIDEWALK SURFACE IS 2%.
3. ALL EXPANSION JOINTS TO BE 3/4" THICK WOOD FIBER ASPHALT-IMPREGNATED EXPANSION BOARD, UNLESS OTHERWISE NOTED.
4. ALL CONCRETE TO BE CLASS 'A' $f'_c=3,000$ PSI. ALL REINFORCING STEEL TO BE GRADE 60, $f_y=60,000$ PSI.
5. SIDEWALKS SHALL BE AT LEAST 4" THICK CONCRETE.
6. CONCRETE SURFACE TO RECEIVE BROOM FINISH.
7. TRANSVERSE CONTRACTION JOINTS 1/8" WIDE BY 1/2" DEEP SHALL BE CUT IN ALL SIDEWALKS AT 5'-0" INTERVALS (MAXIMUM).
8. PROVIDE PEDESTRIAN ACCESSIBLE ROUTE WITH DETECTABLE WARNING SURFACE FOR SIDEWALKS THAT INTERSECT CONTROLLED DRIVEWAYS. DETECTABLE WARNING SURFACE SHALL BE A MINIMUM OF 24" IN DEPTH IN THE DIRECTION OF PEDESTRIAN TRAVEL, AND EXTEND THE FULL WIDTH OF THE ACCESSIBLE ROUTE WHERE IT INTERSECTS THE CONTROLLED DRIVEWAY.

CURB RAMP NOTES:

1. PROVIDE CURB RAMPS WHEREVER AN ACCESSIBLE ROUTE CROSSES (PENETRATES) A CURB.

2. SLOPE CRITERIA

RAMP AND LANDING AREAS

	MAX SLOPE (V:H, %, IN PER FT)
RAMP IN DIRECTION OF TRAVEL	1:12 / 8.03% / 1" PER FT
SIDE SLOPE OF RAMP (FLARE)	1:10 / 10% / 1.2" PER FT
CROSS SLOPE OF RAMP	1:50 / 2% / 0.24" PER FT
LANDING AREA (ALL DIRECTIONS)	1:50 / 2% / 0.24" PER FT

ADJOINING AREAS

SIDEWALK IN DIRECTION OF TRAVEL	1:20 / 5% / 0.60" PER FT
SIDEWALK CROSS SLOPE	1:50 / 2% / 0.24" PER FT
GUTTER IN DIRECTION OF TRAVEL	1:20 / 5% / 0.60" PER FT

A SMOOTH TRANSITION ($S \leq 1:50$) IN DIRECTION OF TRAVEL IS REQUIRED WHERE RAMPS TRANSITION TO THE STREET

3. PROVIDE FLARED SIDES WHERE THE PEDESTRIAN CIRCULATION PATH CROSSES THE CURB RAMP. FLARED SIDES SHALL BE SLOPED AT 10% MAXIMUM, MEASURED PARALLEL TO THE CURB. RETURNED CURBS MAY BE USED ONLY WHERE PEDESTRIANS WOULD NOT NORMALLY WALK ACROSS THE RAMP, EITHER BECAUSE THE ADJACENT SURFACE IS PLANTED, SUBSTANTIALLY OBSTRUCTED, OR OTHERWISE PROTECTED.
4. LANDINGS SHALL BE 5'X5' MINIMUM WITH A MAXIMUM 2% SLOPE IN ANY DIRECTION.
5. CURB RAMP MUST BE WHOLLY CONTAINED WITHIN CROSSWALK MARKINGS, EXCLUDING SIDE FLARES.

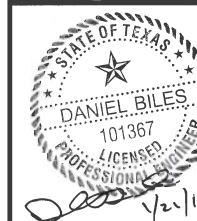
CURB RAMP NOTES (CONTINUED):

6. CURB RAMPS, FLARES AND LANDINGS SHALL BE AT LEAST 5" THICK CONCRETE AND EXPANSION JOINTS SHALL TYPICALLY BE USED AT MATCHLINE WITH ADJOINING AREAS.
7. MANEUVERING SPACE AT THE BOTTOM OF CURB RAMPS SHALL BE A MINIMUM OF 4'X4' WHOLLY CONTAINED WITHIN THE CROSSWALK AND WHOLLY OUTSIDE THE PARALLEL VEHICULAR TRAVEL PATH.
8. LAYBACK CURB AND GUTTER MAY BE CONSTRUCTED MONOLITHICALLY WITH CURB RAMPS. PROVIDE NO. 4 X 12" LONG SMOOTH DOWELS @ 12" ON CENTERS IF NOT PLACED MONOLITHICALLY.
9. PROVIDE A SMOOTH TRANSITION WHERE THE CURB RAMPS CONNECT TO THE STREET. 5% MAXIMUM SLOPE IN GUTTER.
10. ADDITIONAL INFORMATION ON CURB RAMP LOCATION, DESIGN, LIGHT REFLECTIVE VALUE AND TEXTURE MAY BE FOUND IN THE CURRENT EDITION OF THE TEXAS ACCESSIBILITY STANDARDS (TAS) AND 16 TAC §68.102.
11. DIAGONAL CURB RAMPS ARE DISCOURAGED. DIAGONAL CURB RAMPS MAY BE ALLOWED ON A CASE-BY-CASE BASIS ONLY IF OTHER CONFIGURATIONS ARE NOT FEASIBLE, AND MUST BE APPROVED BY THE CITY PRIOR TO CONSTRUCTION.
12. FINAL ACCEPTANCE OF THE PROJECT SHALL BE CONTINGENT UPON THE CONTRACTOR PROVIDING THE CITY WITH A FINAL INSPECTION REPORT FROM A CERTIFIED REGISTERED ACCESSIBILITY SPECIALIST (RAS) PER 16 TAC §68.52 STATING THAT ALL ADA (AMERICANS WITH DISABILITIES ACT) HANDICAP IMPROVEMENTS, AS CONSTRUCTED, COMPLY WITH THE TEXAS ACCESSIBILITY STANDARDS (TAS) FOR ELIMINATION OF ARCHITECTURAL BARRIERS PER TEXAS GOVERNMENT CODE CHAPTER 469.

DETECTABLE WARNING SURFACE NOTES:

1. CURB RAMPS MUST CONTAIN A DETECTABLE WARNING SURFACE THAT CONSISTS OF RAISED TRUNCATED DOMES COMPLYING WITH SECTION 705 OF THE TAS. THE SURFACE MUST CONTRAST VISUALLY WITH ADJOINING SURFACES INCLUDING SIDE FLARES.
2. DETECTABLE WARNING SURFACE FOR RAMPS SHALL BE ADA SOLUTIONS, INC. PART NO. 2460REP CAST-IN-PLACE REPLACEABLE TACTILE WARNING SURFACE TILES TRUNCATED DOME, OR APPROVED EQUIVALENT, IN "BRICK RED" COLOR.
3. ALIGN TRUNCATED DOMES IN THE DIRECTION OF PEDESTRIAN TRAVEL WHEN ENTERING THE STREET.
4. DETECTABLE WARNING SURFACES SHALL BE A MINIMUM OF 24" IN DEPTH IN THE DIRECTION OF PEDESTRIAN TRAVEL, AND EXTEND THE FULL WIDTH OF THE CURB RAMP OR LANDING WHERE THE PEDESTRIAN ACCESS ROUTE ENTERS THE STREET.
5. DETECTABLE WARNING SURFACES SHALL BE LOCATED SO THAT THE EDGE NEAREST THE CURB LINE IS A MINIMUM OF 6" AND A MAXIMUM OF 10" FROM THE EXTENSION OF THE FACE OF CURB. DETECTABLE WARNING SURFACES TO BE CURVED ALONG THE CORNER RADIUS.

CONSULTANT'S JOB NO.



DESCRIPTION

BY

DATE

REVISION NO.

CITY OF
CORPUS CHRISTI
TEXAS



Department of Engineering Services

DESCRIPTION

BY

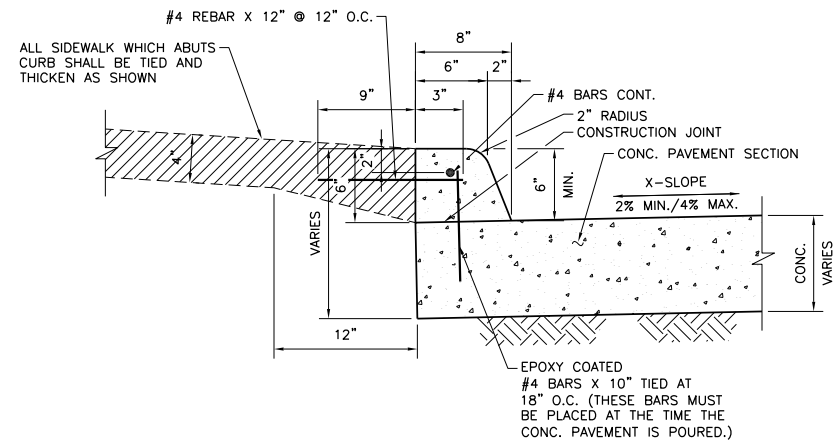
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SHEET ____ of ____
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CITY PROJECT #

CITY OF CORPUS CHRISTI PEDESTRIAN
CURB RAMP STANDARDS 2 OF 4

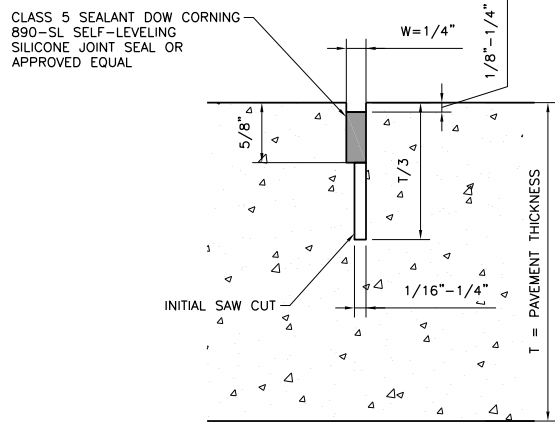


TYPICAL 6" CURB DETAIL

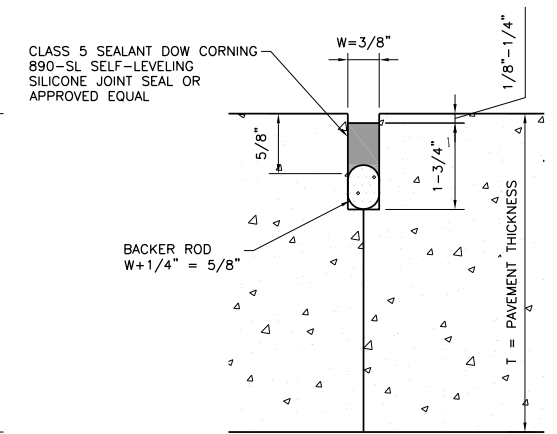
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6" CURB NOTES:

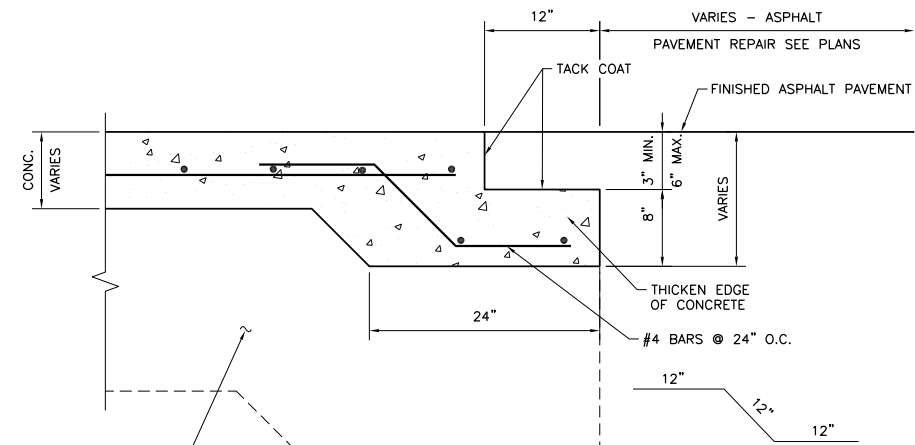
1. EXPANSION AND CONSTRUCTION JOINTS OF THE 6" SEPARATE CURB SHALL MATCH THOSE OF THE TIED SIDEWALK AND/OR CONCRETE PAVEMENT, AND SHALL NOT EXCEED 39' O.C. (MAX) SPACING.
2. TRANSVERSE GROOVES 1/8" WIDE BY 1/2" DEEP SHALL BE MADE AT 10' O.C. (MAXIMUM).
3. WHERE NEW CURB JOINS EXISTING CURB AND GUTTER, TRANSITION THE LAST 10' OF THE NEW TO MATCH THE OLD IN SHAPE.
4. EXPANSION JOINTS ON ALL SIDEWALK AND CURB SHALL BE REDWOOD. ALL JOINTS IN 6" SEPARATE CURB SHALL BE SEALED WITH JOINT SEALANT.
5. TRANSVERSE CONTRACTION JOINTS 1/8" WIDE BY 1/2" DEEP SHALL BE CUT IN ALL SIDEWALKS AT 5'-0" INTERVALS (MAXIMUM).



SAWED LONGITUDINAL JOINT



LONGITUDINAL OR TRANSVERSE CONSTRUCTION JOINT

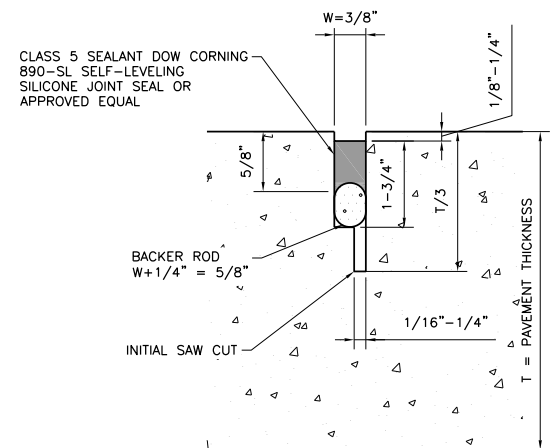


CONCRETE TO ASPHALT PAVEMENT SECTION TIE-IN DETAIL

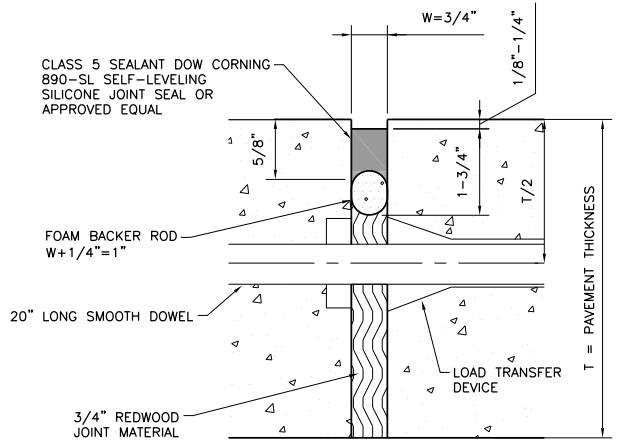
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NOTE:

IN NO CASE SHALL THE THICKNESS OF THE ASPHALT OR BASE MATERIAL BE LESS THAN THE THICKNESS OF EXISTING ADJACENT MATERIAL.



TRANSVERSE SAWED CONTRACTION JOINT



EXPANSION JOINT


JOINT SEALANT COMPOUND

NOT TO SCALE

GENERAL NOTES:

1. THE LOCATION OF JOINTS SHALL BE AS SHOWN ELSEWHERE IN THE DRAWINGS.
2. THE JOINT RESERVOIR FOR SEALANT SHALL BE SAWED UNLESS OTHERWISE SHOWN ON THE PLANS FOR THE LONGITUDINAL AND TRANSVERSE CONSTRUCTION AND THE TWO SAWED JOINTS.
3. THE JOINTS SHALL BE CLEANED IN ACCORDANCE WITH THE SEALANT MANUFACTURE'S RECOMMENDATION. PRIOR TO BEGINNING OPERATIONS, THE CONTRACTOR SHALL SUBMIT A STATEMENT FROM THE SEALANT MANUFACTURER SHOWING THE RECOMMENDED EQUIPMENT AND INSTALLATION PROCEDURES TO BE USED.
4. THE SAW CUT FOR THE LONGITUDINAL JOINT SHALL BE ONE FOURTH THE SLAB THICKNESS WHEN CRUSHED LIMESTONE IS USED AS THE COARSE AGGREGATE.

REVISION NO.	DATE	BY	DESCRIPTION



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

CITY OF CORPUS CHRISTI
CONCRETE PAVEMENT
STANDARD DETAILS

SHEET _____ of _____
RECORD DRAWING NO.

CITY PROJECT # _____

WATER DISTRIBUTION SYSTEM GENERAL NOTES

- PROPOSED WATER DISTRIBUTION SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH CITY OF CORPUS CHRISTI WATER DIVISION DISTRIBUTION SYSTEM STANDARDS.
- 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.
- 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.
- THE CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT REQUIRED TO INSTALL THE PROPOSED SYSTEM.
- 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.
- 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.
- 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.
- 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).
- 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)
- 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.
- 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.
- ALL NIPPLES BETWEEN FITTINGS AND VALVES ALONG MAINS SHALL BE DUCTILE IRON.
- 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.
- 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.
- 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.
- CONTRACTOR SHALL COORDINATE WITH WATER DIVISION INSPECTOR AND NOTIFY ALL AFFECTED CUSTOMERS 24 HOURS PRIOR TO KILLOUT OF EXISTING WATER SYSTEM.
- 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.
- CONTRACTOR SHALL KEEP ALL EXISTING VALVES ACCESSIBLE DURING ALL PHASES OF CONSTRUCTION.
- ALL NEW WATER MAINS SHALL BE INSTALLED SO THAT PIPE IDENTIFICATION MARKINGS ARE LOCATED ON THE TOP OF THE PIPE.
- ALL SERVICE LINES UNDER PAVEMENT SHALL BE ONE INCH, INSIDE DIAMETER, MINIMUM.

SPECIAL NOTE:

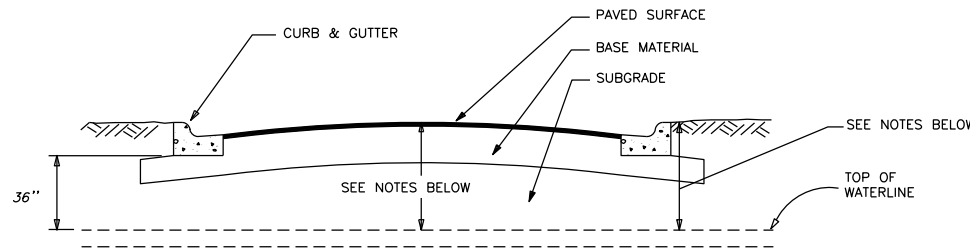
ENGINEER SHALL CONTACT THE UTILITY DEPARTMENT FOR WATER VAULT DESIGN COORDINATION.

SEPARATION OF WATER AND WASTEWATER LINES

- THE SEPARATION OF WATER AND WASTEWATER 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.
- WHENEVER WATER & WASTEWATER LINES CROSS, ONE JOINT OF C900 PVC WATER LINE SHALL BE CENTERED OVER THE WASTEWATER 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.

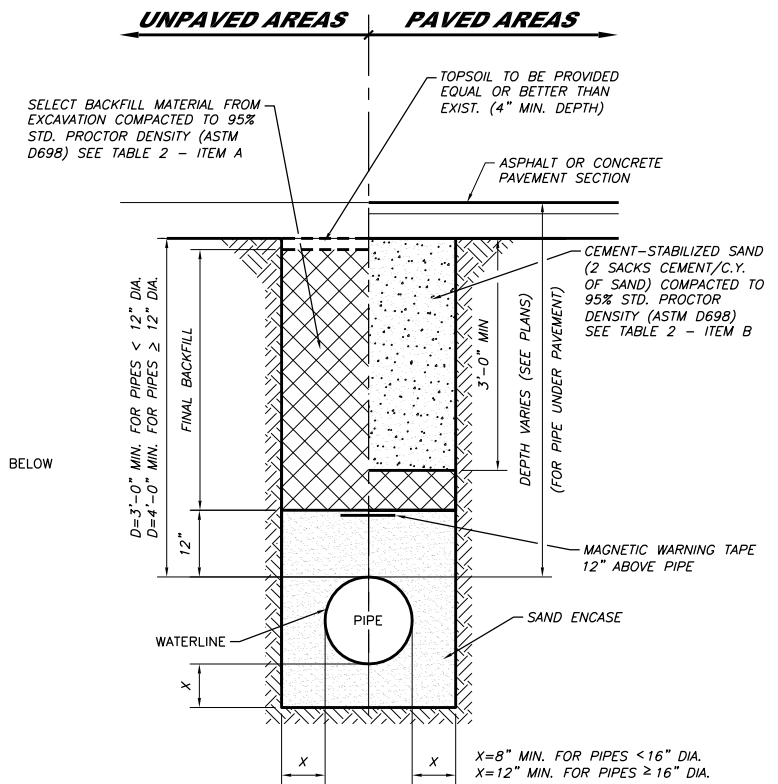


WATERLINE MINIMUM COVER REQUIREMENTS

NOT TO SCALE

NOTES:

- 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.
- ALL TRANSMISSION MAINS (12" DIAMETER & ABOVE) IN THE STREET SHALL HAVE 48" OF COVER AT ALL POINTS.
- ALL MAINS NOT UNDER THE STREET SHALL HAVE A MINIMUM OF 36" OF COVER AT ALL POINTS.



TYP. PIPE TRENCHING, BEDDING AND BACKFILL FOR WATERLINE

NOT TO SCALE

NOTE: (CONCRETE PAVEMENT ONLY)

CONTRACTOR HAS OPTION TO USE CEMENT STABILIZED SAND OR BACKFILL WITH SELECT BACKFILL MATERIAL

GENERAL NOTES FOR BACKFILL

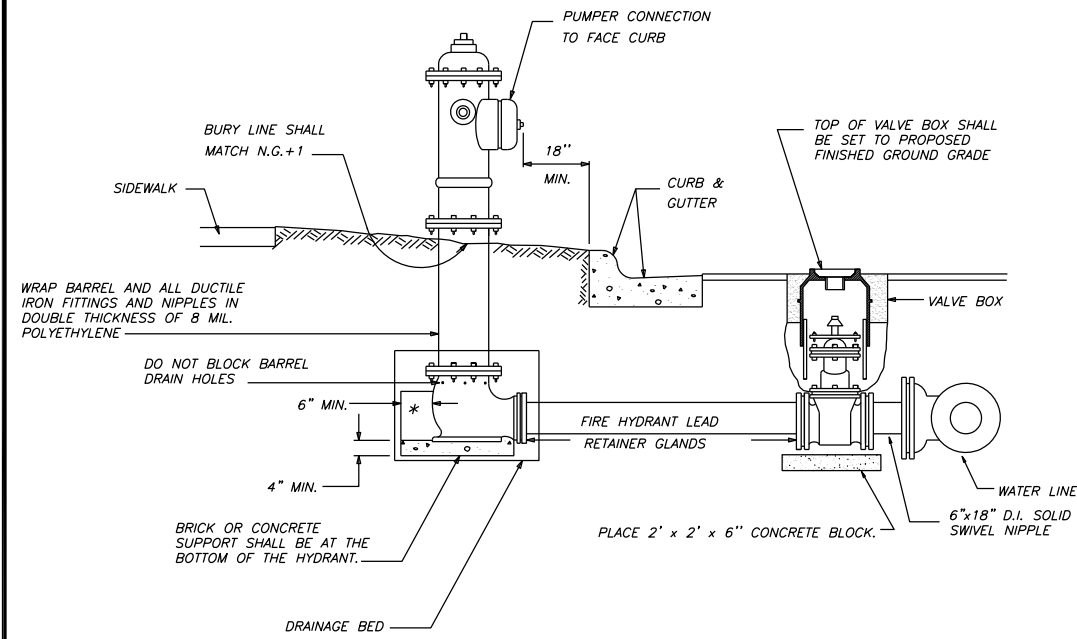
TABLE 1 BEDDING AND INITIAL BACKFILL (BELOW PIPE TO 12" ABOVE PIPE)	TABLE 2 FINAL BACKFILL (GREATER THAN 12" ABOVE PIPE)	
	UNPAVED AREAS	PAVED AREAS
<p>ALL BEDDING AND INITIAL BACKFILL SHALL CONSIST OF THE FOLLOWING OR REFER TO DESIGN ENGINEER REQUIREMENTS: GRANULAR BACKFILL CONSISTING OF EITHER NATURAL SAND OR SANDY GRAVEL, OR MATERIAL PRODUCED BY CRUSHING OF NATURAL STONE OR GRAVEL.</p> <p>WATER LINES:</p> <ol style="list-style-type: none"> 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 <p>AND IN ADDITION: PASSING 1/2" SIEVE - 100% PASSING #4 SIEVE - 30% MINIMUM PLASTICITY INDEX (PI) - NP TO 10 MAX.</p> <ol style="list-style-type: none"> IN DEEP EXCAVATIONS (>20') OR BELOW WATER TABLE, USE CRUSHED STONE OR CRUSHED GRAVEL MEETING GRADATION OF: A. CONCRETE COARSE AGGREGATE; TxDOT ITEM 421; GRADE 2, 3, OR 4. 	<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. COMPACT MATERIAL TO 95% STD. PROCTOR (D698). MOISTURE TO BE ADJUSTED TO ± 3% OF OPTIMUM.</p> <p>B. TOPSOIL TO BE PROVIDED EQUAL OR BETTER THAN EXISTING; AND MATCH EXISTING TOPSOIL DEPTH. COMPACT TO FIT CONFLICT TO EXISTING ADJACENT TOPSOIL. (CONSTRUCTION TO BE PERFORMED BY "DOUBLE DITCH" METHOD TOP SOIL SALVAGED TO BE PLACED ON TOP)</p>	<p>A. FOR 12" ABOVE PIPE TO 3' BELOW BOTTOM OF ROAD BASE; BACKFILL SHALL BE SELECT MATERIAL FROM EXCAVATION OR TO BE IMPORTED MATERIAL IN EITHER CASE, ALL MATERIAL SHALL MEET THE FOLLOWING: LL<35 PI 8-20 NO CLUMPS > 2" DIA. MOISTURE 0 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 BELOW (OR PER DESIGN ENGINEER)</p> <p>B. FOR 3' BELOW BOTTOM OF ROAD BASE TO BOTTOM OF ROAD BASE: BACKFILL SHALL BE CEMENT STABILIZED SAND (2 SK/C.Y.) AND SHALL MEET THE FOLLOWING REQUIREMENTS: SAND GRADATION: % PASSING #4 55-100 #10 40-100 #40 25-100 #200 10-20 PI NP-10 (OR AS PER DESIGN ENGINEER) COMPACT TO 95% OF D698. MOISTURE TO BE ADJUSTED TO (+/-2%) OF OPTIMUM.</p>

CITY OF CORPUS CHRISTI
TEXAS
Department of Engineering Services

CITY OF CORPUS CHRISTI
WATER STANDARD DETAILS
WATER DISTRIBUTION SYSTEM GENERAL NOTES & BACKFILL AND EMBEDMENT DETAILS

SHEET ____ of ____
RECORD DRAWING NO. ____
CITY PROJECT # ____

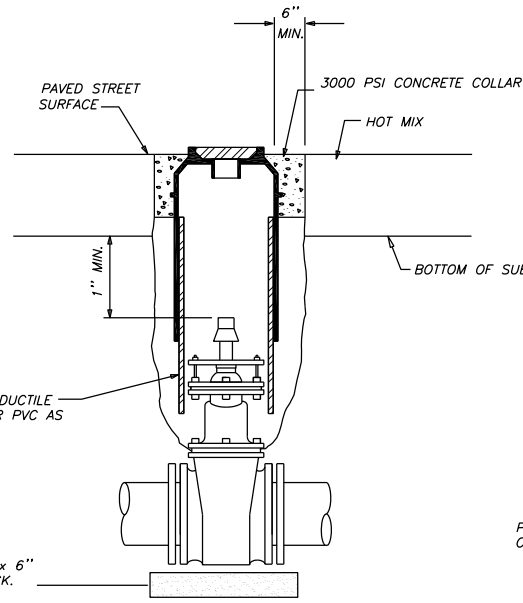
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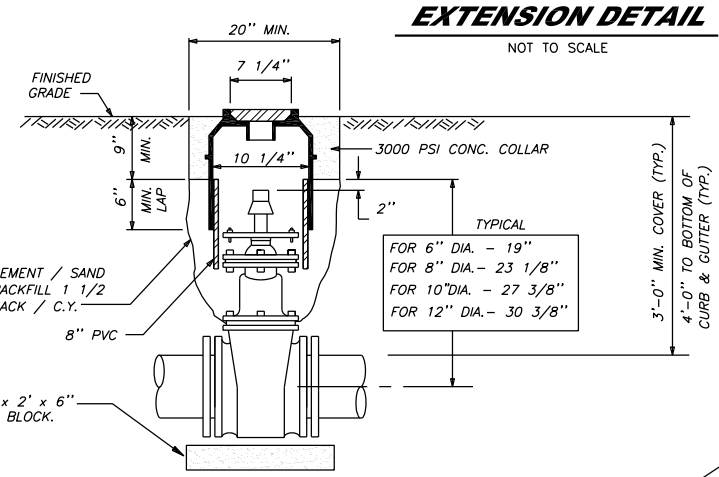
FIRE HYDRANT ASSEMBLY DETAIL (TYPE 1)
NOT TO SCALE

- * 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.

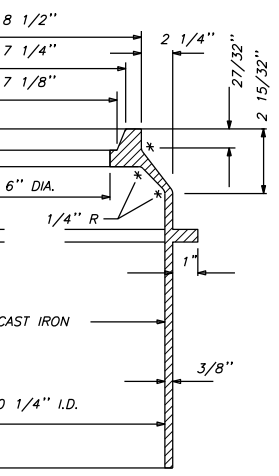


VALVE BOX DETAIL @ PAVEMENT
NOT TO SCALE

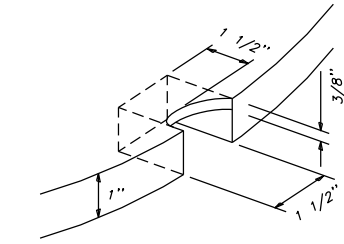


VALVE BOX DETAIL @ NATURAL GROUND
NOT TO SCALE

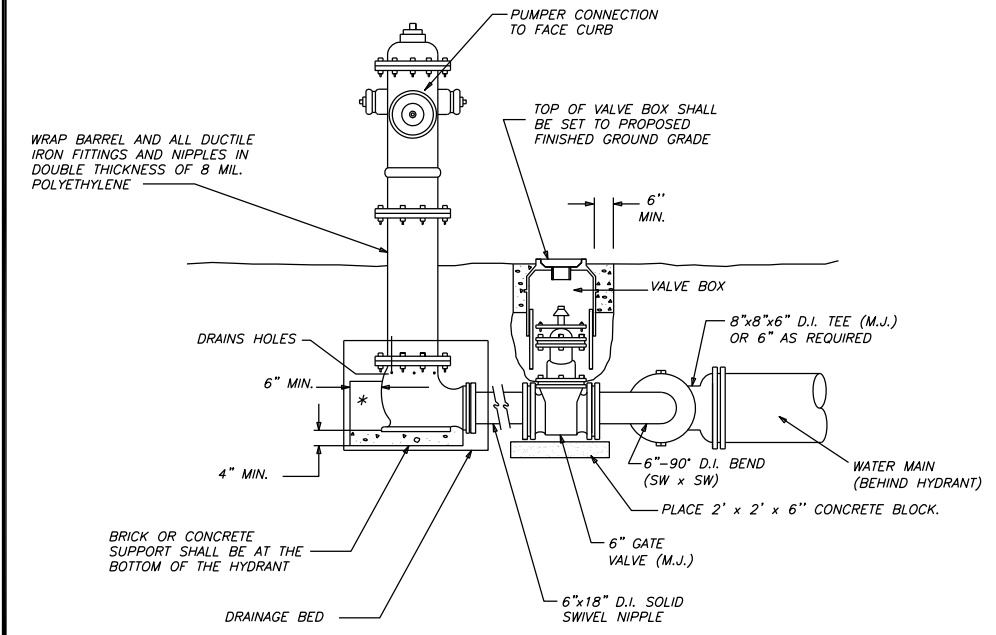
ALL VALVES SHALL BE HOUSED IN APPROVED VALVE BOXES



EXTENSION DETAIL
NOT TO SCALE

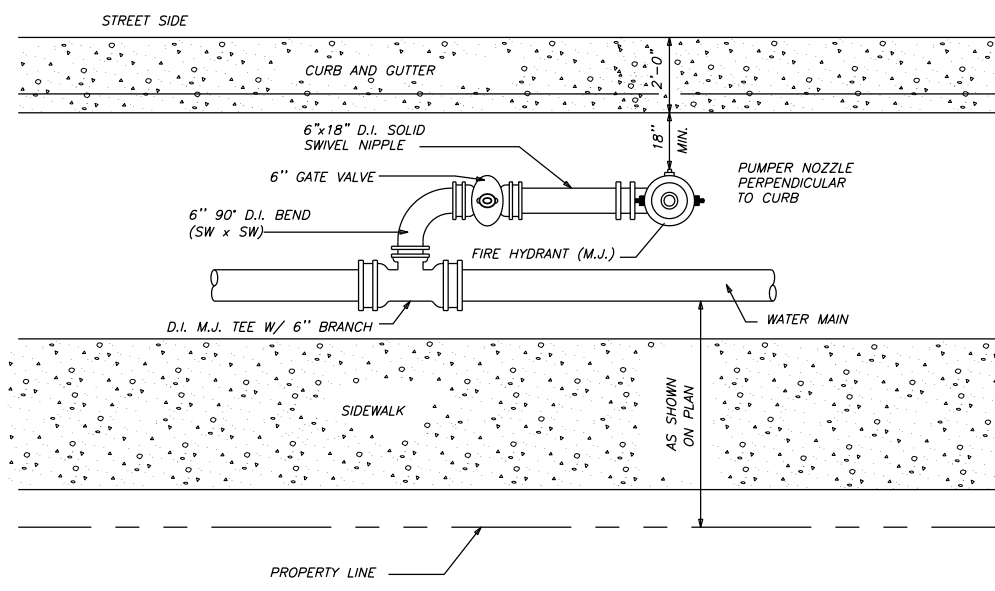


PICK NOTCH
NOT TO SCALE

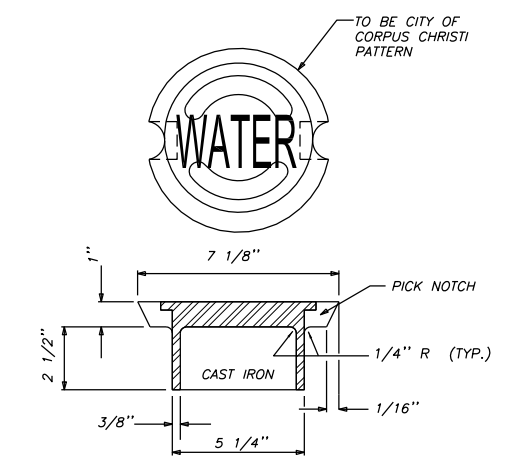


FIRE HYDRANT ASSEMBLY DETAIL (TYPE 2)
WATER LINE BEHIND CURB
NOT TO SCALE

- * 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.

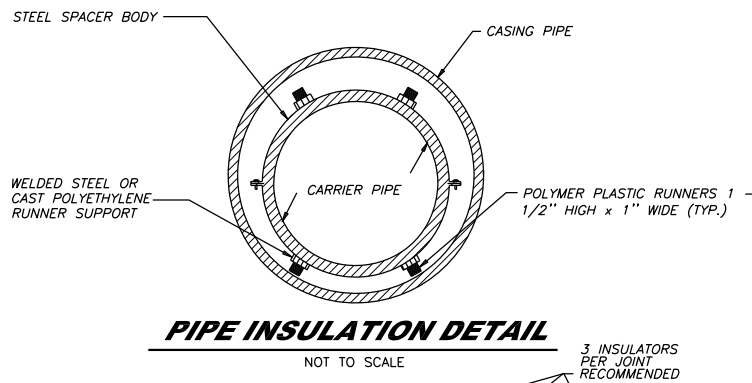


FIRE HYDRANT ASSEMBLY DETAIL (TYPE 2)
NOT TO SCALE



LID DETAIL
NOT TO SCALE

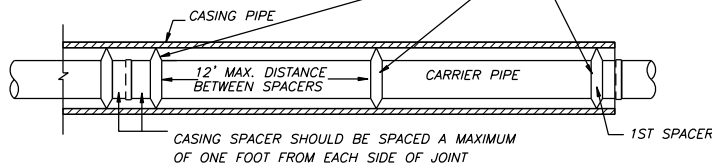
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PIPE INSULATION DETAIL

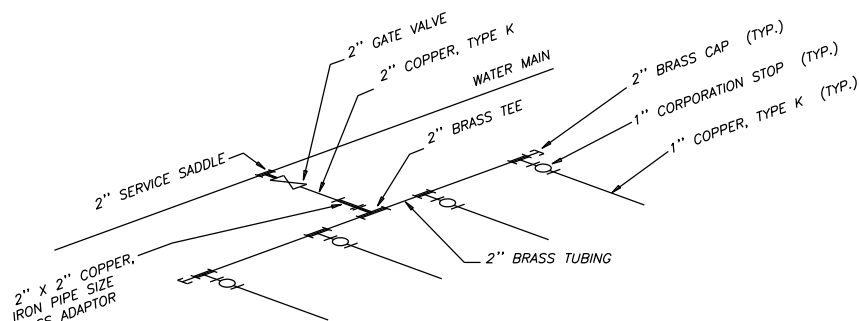
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3 INSULATORS PER JOINT RECOMMENDED



INSULATOR SPACING DETAIL

NOT TO SCALE

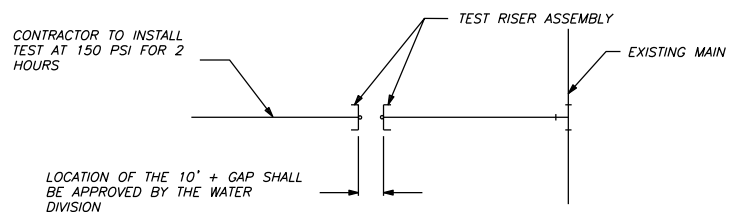


NOTE:

MANIFOLDS LARGER THAN SIX CONNECTIONS WILL REQUIRE APPROVAL FROM THE CITY OF CORPUS CHRISTI WATER DEPARTMENT FOR ANOTHER WATER TAP AND SERVICE.

THREE TO SIX WATER CONNECTIONS

NOT TO SCALE



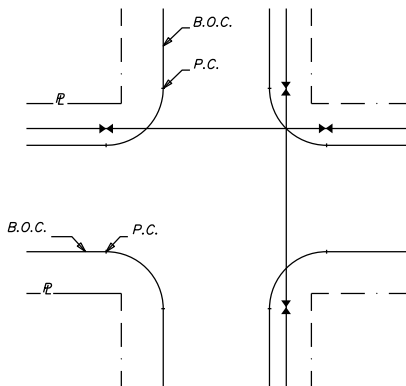
1. HYDROSTATIC TEST: WATER FOR FILLING THE NEW WATER LINE AND PERFORMING TESTS WILL BE FURNISHED TO THE CONTRACTOR BY THE CITY OF CORPUS CHRISTI THROUGH A STANDARD WATER CONSTRUCTION METER CONNECTION. STANDARD WATER CONSTRUCTION METER AND GAUGE WILL BE SUPPLIED BY THE CITY AFTER THE CONTRACTOR HAS PAID 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).
2. BACTERIOLOGICAL TEST: CONTRACTOR SHALL FURNISH AND INSTALL TEST RISER ASSEMBLY. AFTER BACTERIOLOGICAL SAMPLE PASSES TEST, CONTRACTOR SHALL REMOVE TEST RISER ASSEMBLIES 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 THE / CONNECTION. CONTRACTOR WILL SCHEDULE & COORDINATE WITH WATER DIVISION INSPECTOR ON DATE & TIME OF TIE-IN. (24 HOURS NOTIFICATION)
3. CONTRACTOR SHALL FURNISH AND INSTALL TAPPING SLEEVE OR SADDLE AND TAPPING GATE VALVE AND VALVE BOX COMPLETE. CITY TO MAKE TAP (72 HOURS NOTIFICATION)

DETAIL "A" TEST RISER ASSEMBLY CONNECTION

NOT TO SCALE

CASING SPACERS

- A. ALL CARRIER PIPE IN CASING INSTALLED BY JACKING OR BORING SHALL BE SUPPORTED BY BOLT-ON STYLE CASING SPACERS, AS MANUFACTURED BY ADVANCE PRODUCTS INC. OR ENGINEER APPROVED EQUAL.
- B. CASING SPACERS FOR PIPE INSTALLED IN CASING SHALL HAVE A FUSION BONDED EPOXY CARBON STEEL BODY, NEOPRENE OR PVC LINER, STEEL SUPPORTS AND U.H.M.W. POLYETHYLENE RUNNERS.
- C. CASING SPACERS SHALL BE SIZED TO SECURELY FASTEN ON TO THE CARRIER PIPE BARRIER O.D. AND SHALL BE FURNISHED WITH A MINIMUM RUNNER HEIGHT TO PREVENT THE PIPE FROM RESTING OR SLIDING ON ITS JOINTS DURING THE INSTALLATION.
 1. POSITIONING OF SPACERS SHOULD ENSURE THAT THE CARRIER PIPE IS ADEQUATELY SUPPORTED THROUGHOUT ITS LENGTH.
 2. SPACERS AT EACH END SHALL NOT BE FURTHER THAN 6" FROM THE END OF CASING REGARDLESS OF SIZE OF CASING AND CARRIER PIPE OR TYPE OF SPACER USED.
- D. FOR PIPE WITH MECHANICAL JOINTS, FLANGES OR BELL AND SPIGOT JOINTS, CASING SPACERS SHALL BE INSTALLED WITHIN ONE FOOT ON EACH SIDE OF THE BELL OR FLANGE AND ONE IN THE CENTER OF THE JOINT WHEN 18 TO 20 FOOT LONG JOINTS ARE USED. MAXIMUM SPACING FOR SPACERS IS 12 FEET.

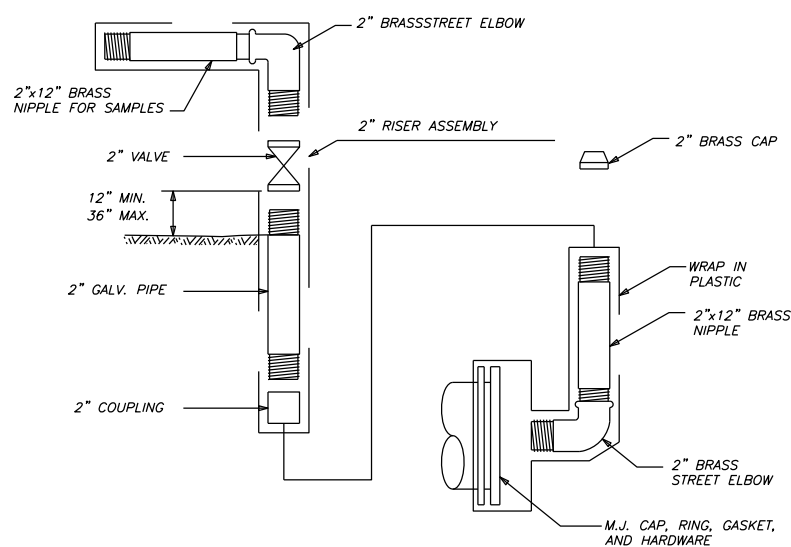


NOTE:

VALVES SHALL BE INSTALLED AT THE POINT OF CURVATURE (P.C.) OF THE CURB WHENEVER POSSIBLE.

TYPICAL VALVE INSTALLATION AT INTERSECTIONS

NOT TO SCALE



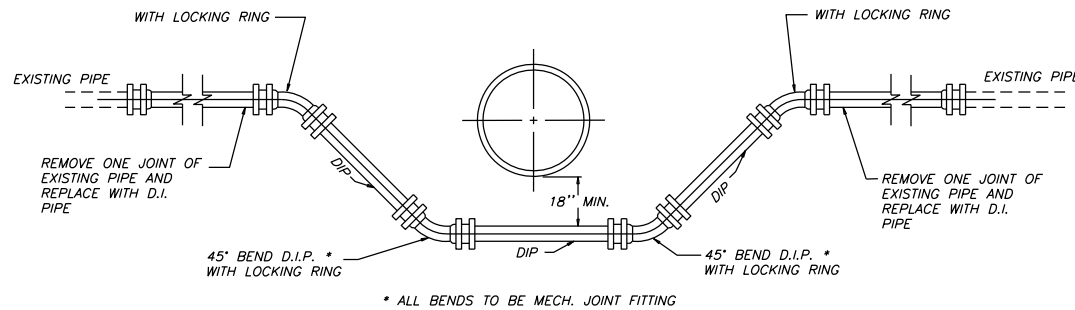
NOTE:

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



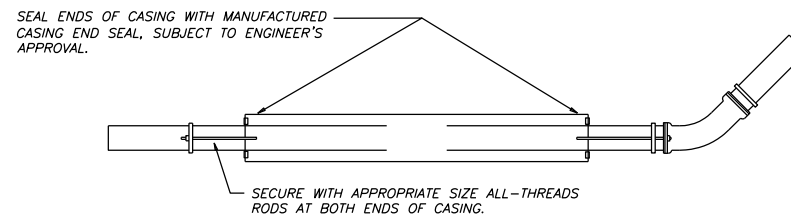
WATERLINE ADJUSTMENT DETAIL

NOT TO SCALE

* ALL BENDS TO BE MECH. JOINT FITTING

NOTE:

SEE #18 UNDER GENERAL NOTES

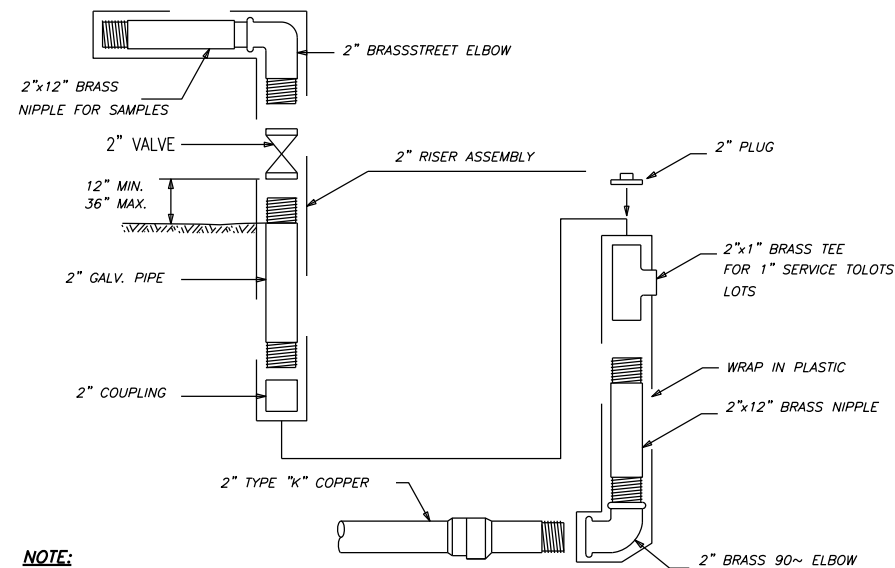


NOTE:

CASING SHALL BE STEEL.

TYPICAL CASING DETAIL

NOT TO SCALE



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

DESCRIPTION

BY

DATE

REVISION NO.

DESCRIPTION

BY

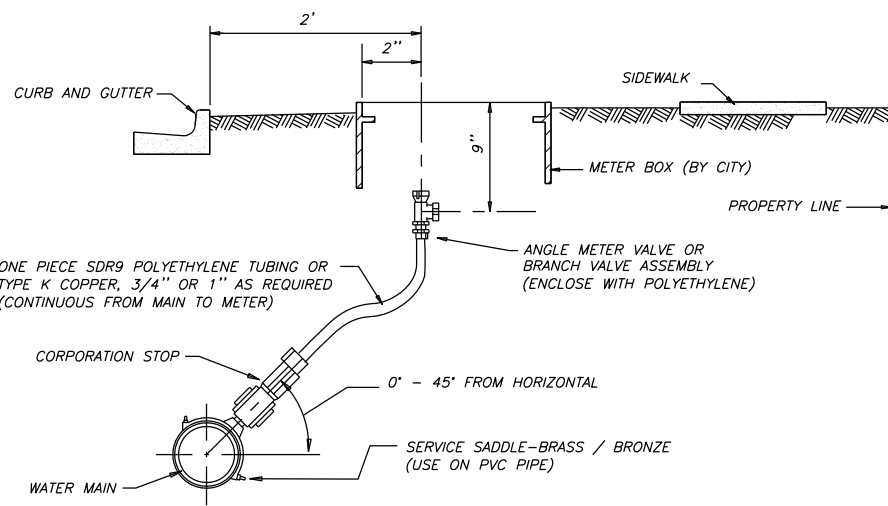
DATE

REVISION NO.

CITY OF CORPUS CHRISTI
TEXAS
Department of Engineering Services

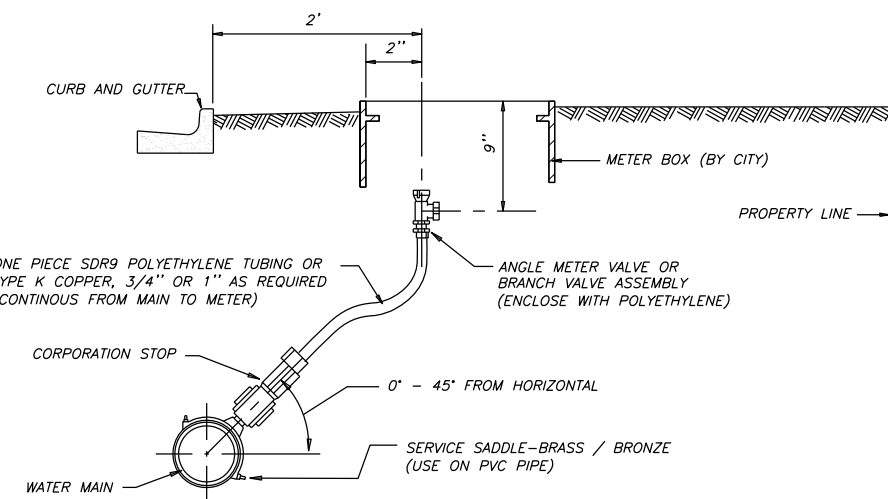
CITY OF CORPUS CHRISTI
WATER STANDARD DETAILS
ADJUSTMENTS, CASING DETAILS, RISER DETAILS
& TYP. VALVE LAYOUT

SHEET ____ of ____
RECORD DRAWING NO.
CITY PROJECT #



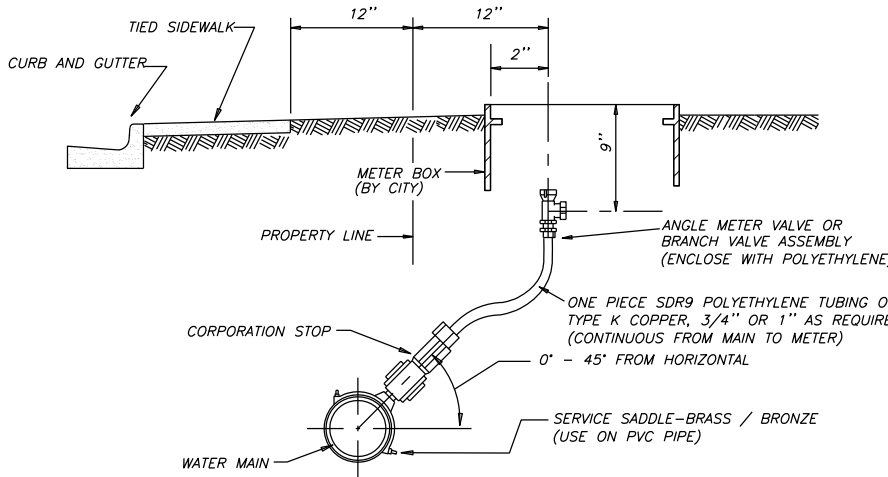
SERVICE WITH SIDEWALK

NOT TO SCALE



SERVICE WITHOUT SIDEWALK

NOT TO SCALE

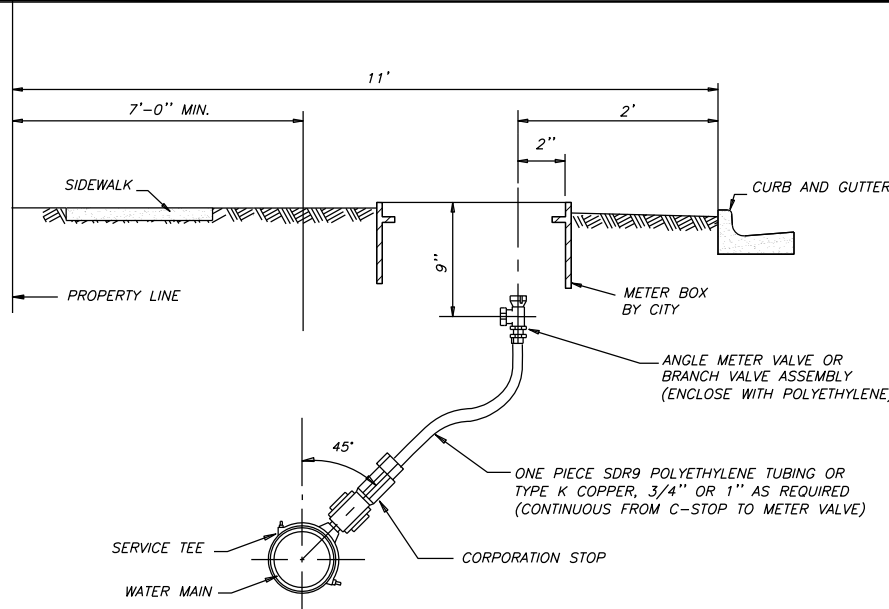


SERVICE WITH SIDEWALK TIED TO CURB

NOT TO SCALE

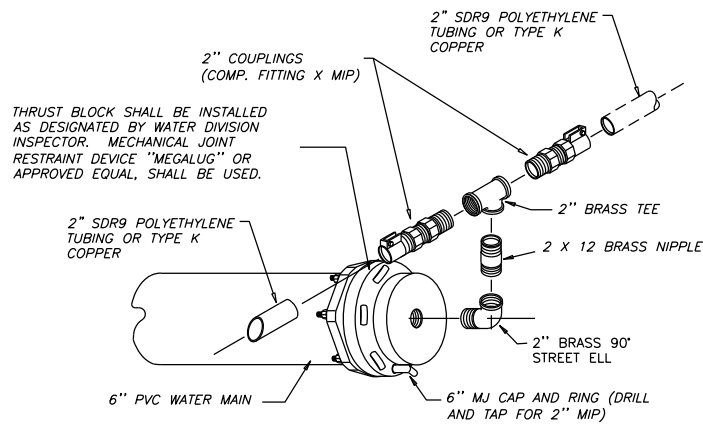
NOTES:

- 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.
- IF THERE IS MORE THAN 2' FROM BACK OF SIDEWALK TO PROPERTY LINE, THE METER BOX SHALL BE PLACED BEHIND SIDEWALK.
- THE WATER DIVISION WILL APPROVE ANY PLACEMENT OF A SERVICE LINE IN A TIEDSIDEWALK SITUATION.



TYPICAL CUL-DE-SAC SERVICE

NOT TO SCALE

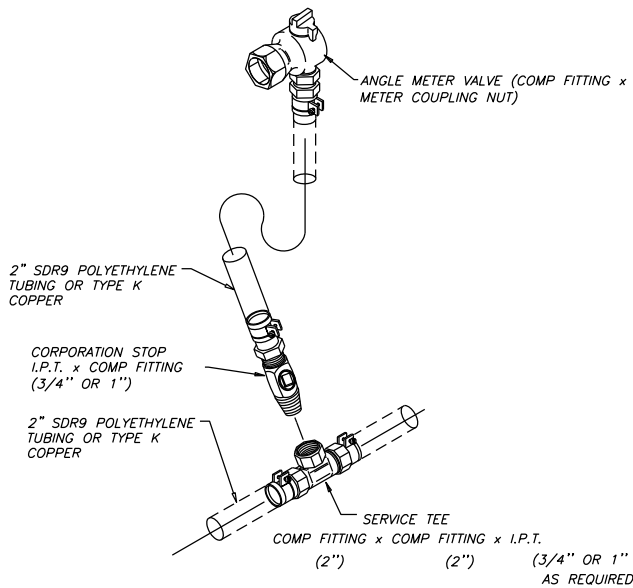


NOTE:

NO MORE THAN 3 LOTS SHALL BE SERVED PER LEG.

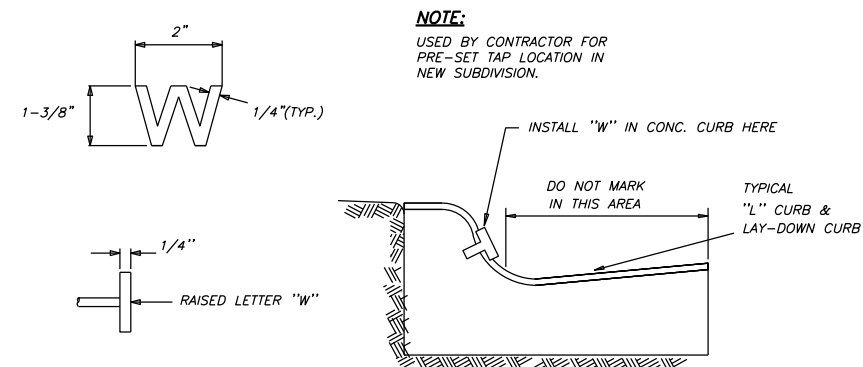
TYPICAL CONNECTION DETAIL

NOT TO SCALE



TYPICAL CONNECTION DETAIL

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.

ONE PIECE SDR9 POLYETHYLENE TUBING OR 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)

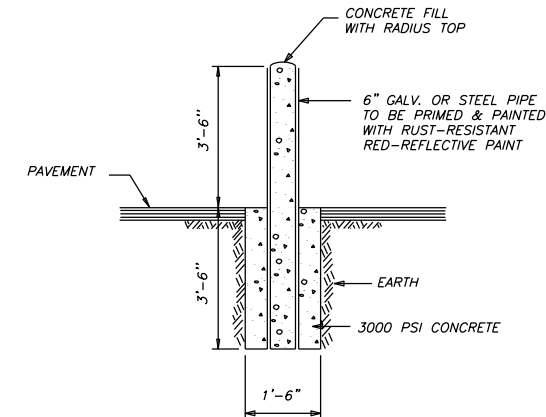
REQUIRED AT ALL METERS - 3/4" & 1" - FEMALE I.P. BY PVC COMPRESSION.

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. C800-66 AND BE WRAPPED IN POLYETHYLENE.



NOTE:

DO NOT PLACE BOLLARD IN FRONT OF HOSE OUTLETS

BOLLARD DETAIL

NOT TO SCALE

DESCRIPTION

BY

DATE

REVISION NO.

DESCRIPTION

BY

DATE

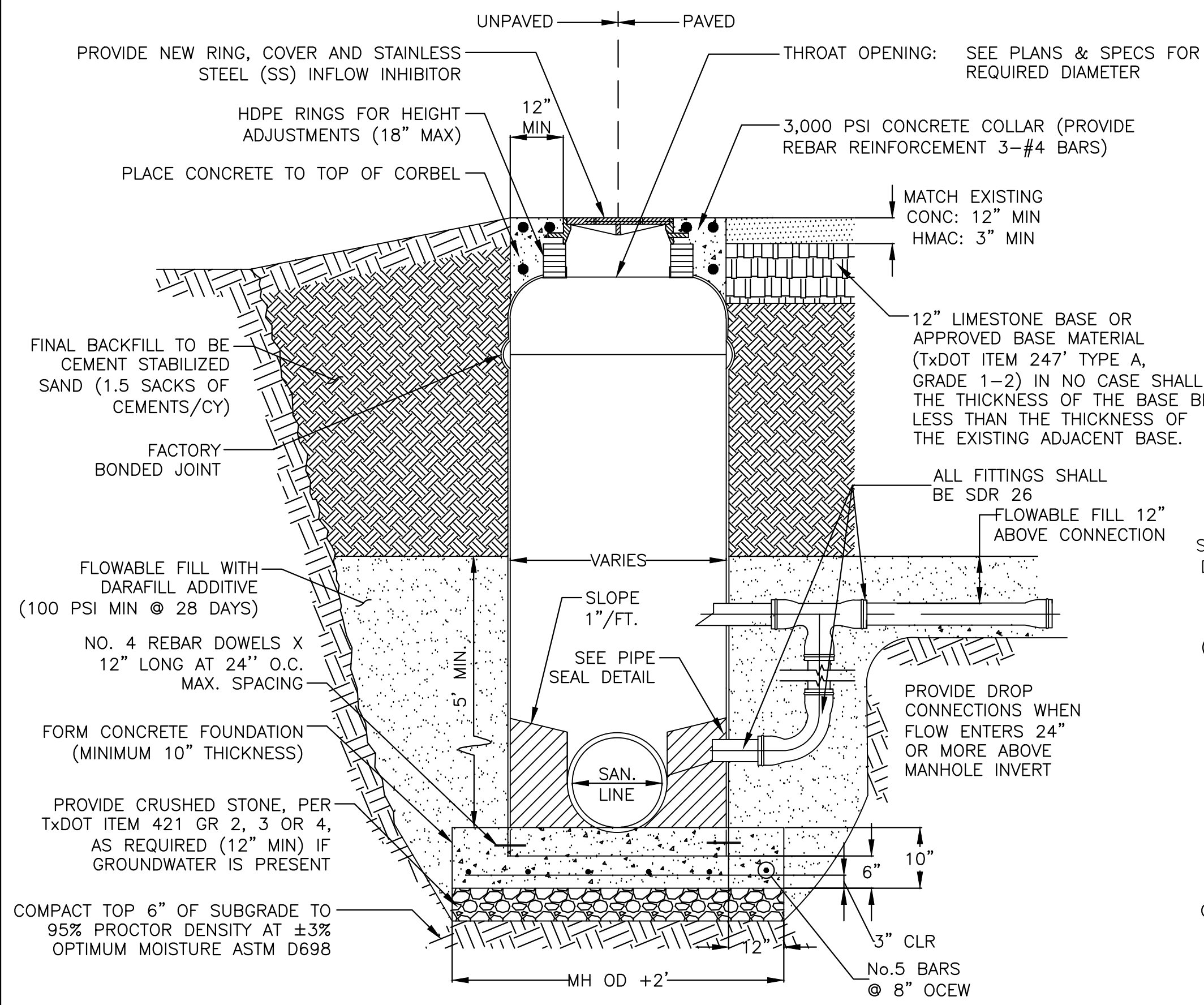
REVISION NO.

CITY OF CORPUS CHRISTI
TEXAS
Department of Engineering Services

CITY OF CORPUS CHRISTI
WATER STANDARD DETAILS
MAIN TO SERVICE DETAILS AND OTHERS

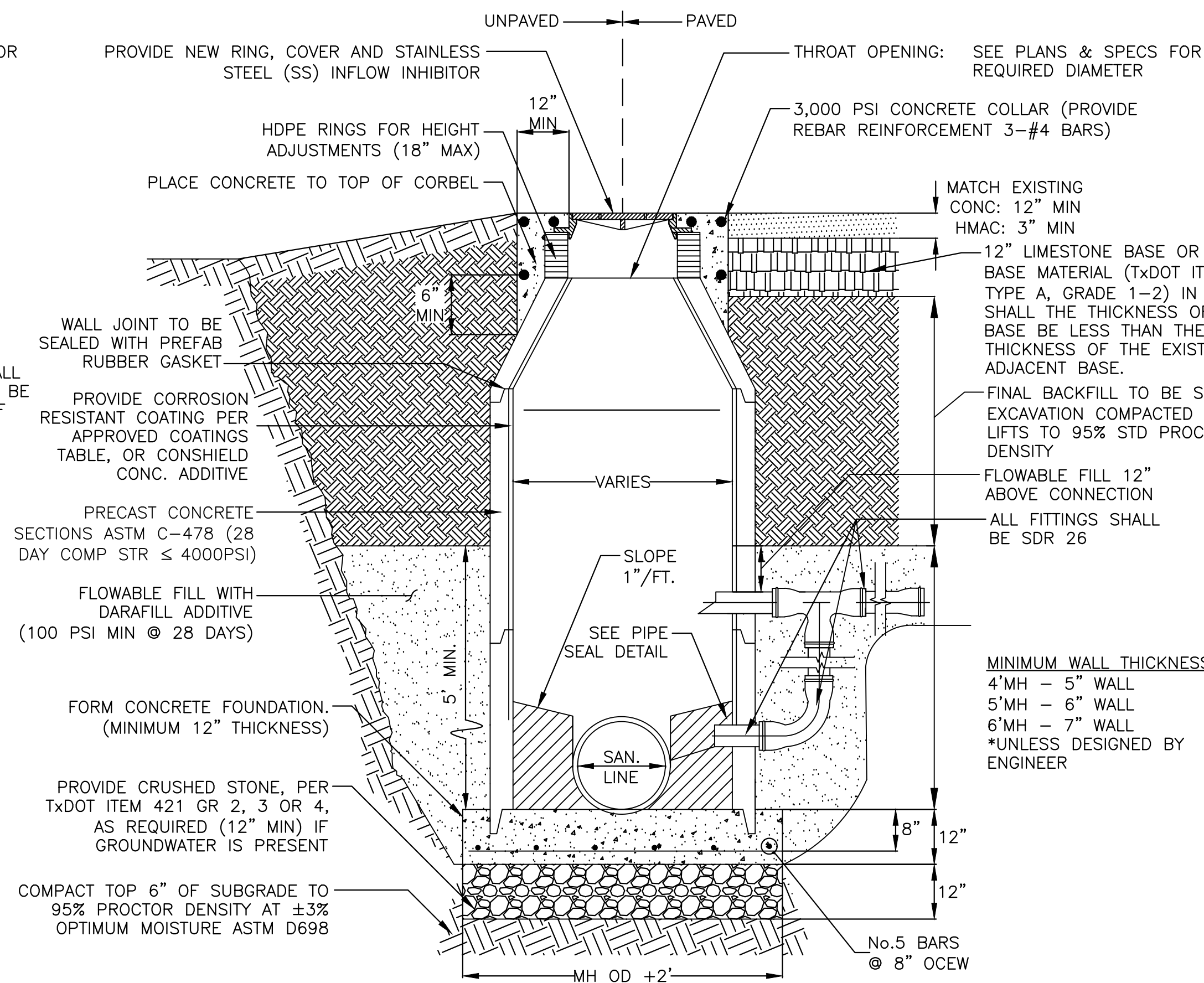
SHEET ____ of ____
RECORD DRAWING NO.

CITY PROJECT #



FIBERGLASS MANHOLE

NOT TO SCALE



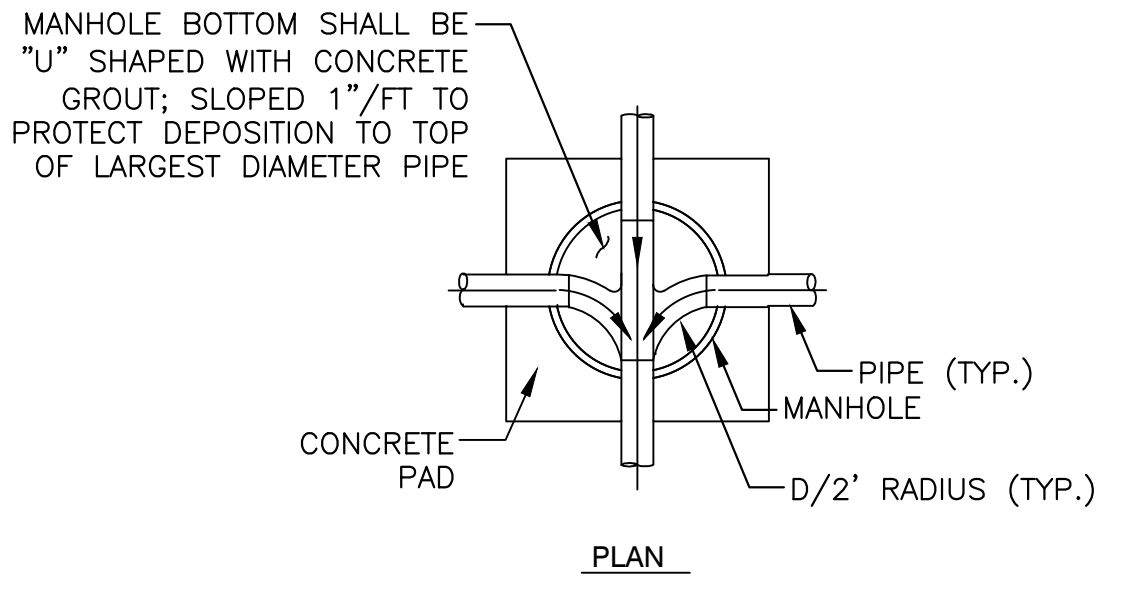
CONCRETE MANHOLE

NOT TO SCALE

MANHOLE REQUIREMENTS	
PIPE DIAMETER	MANHOLE DIAMETER
≤18"	4'
18"< TO ≤36"	5'
36"< TO ≤42"	6'

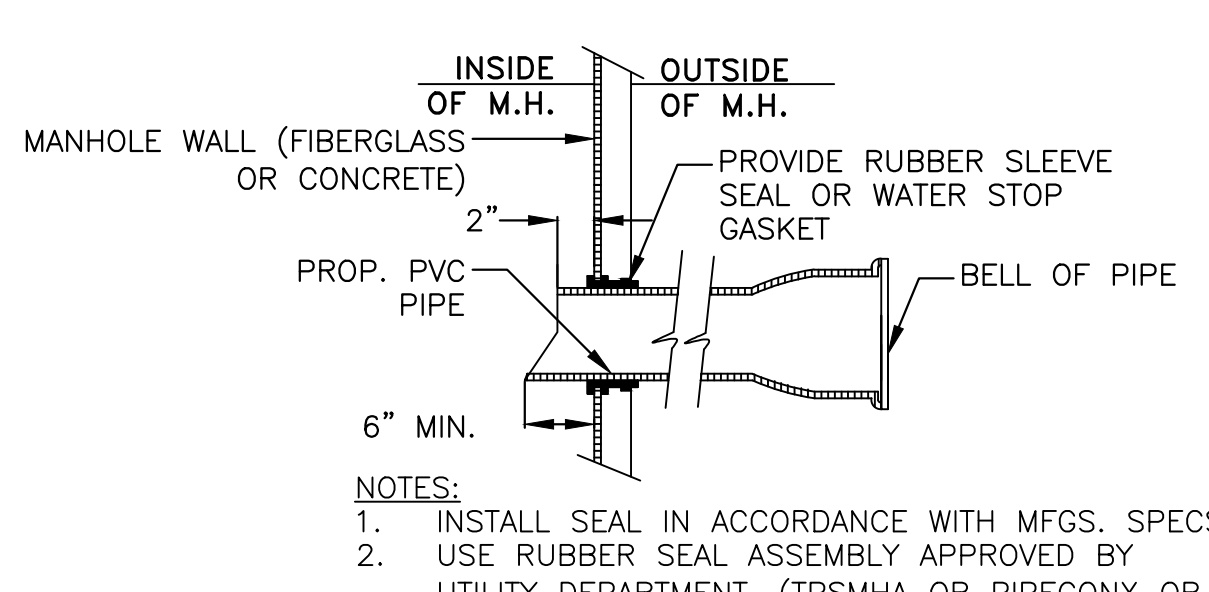
APPROVED COATINGS TABLE	
MANUFACTURER	MODEL NAME
JEFFCOAT	JEFFCOAT 326
RAVEN LINING SYSTEM	RAVEN 405
SHERWIN WILLIAMS	DURAPLATE 5800
CARBOLINE	PHENOLINE 309

NOTE:
COAT ALL CONCRETE SURFACES INCLUDING BENCH & WALLS.



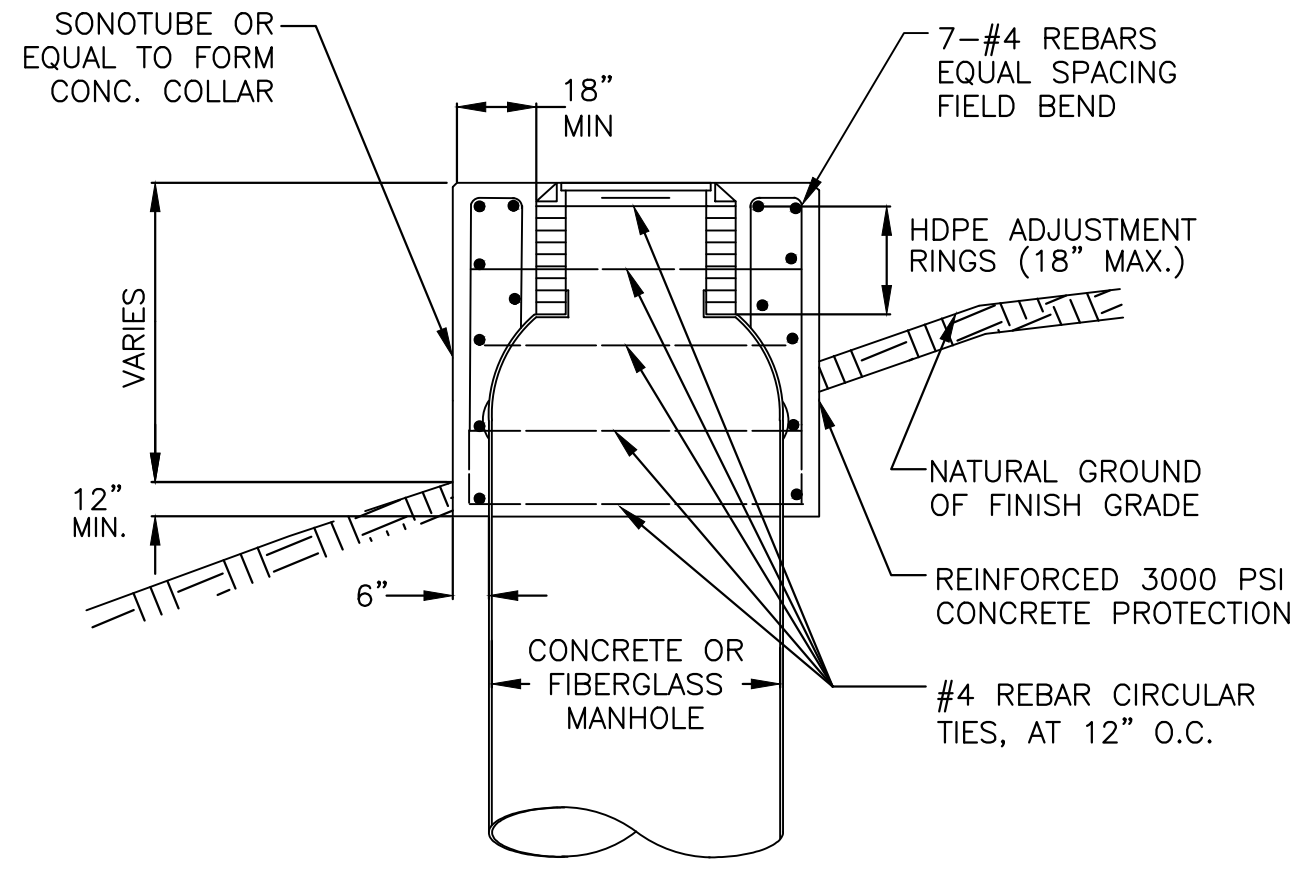
WASTEWATER MANHOLE (BOTTOM)

NOT TO SCALE



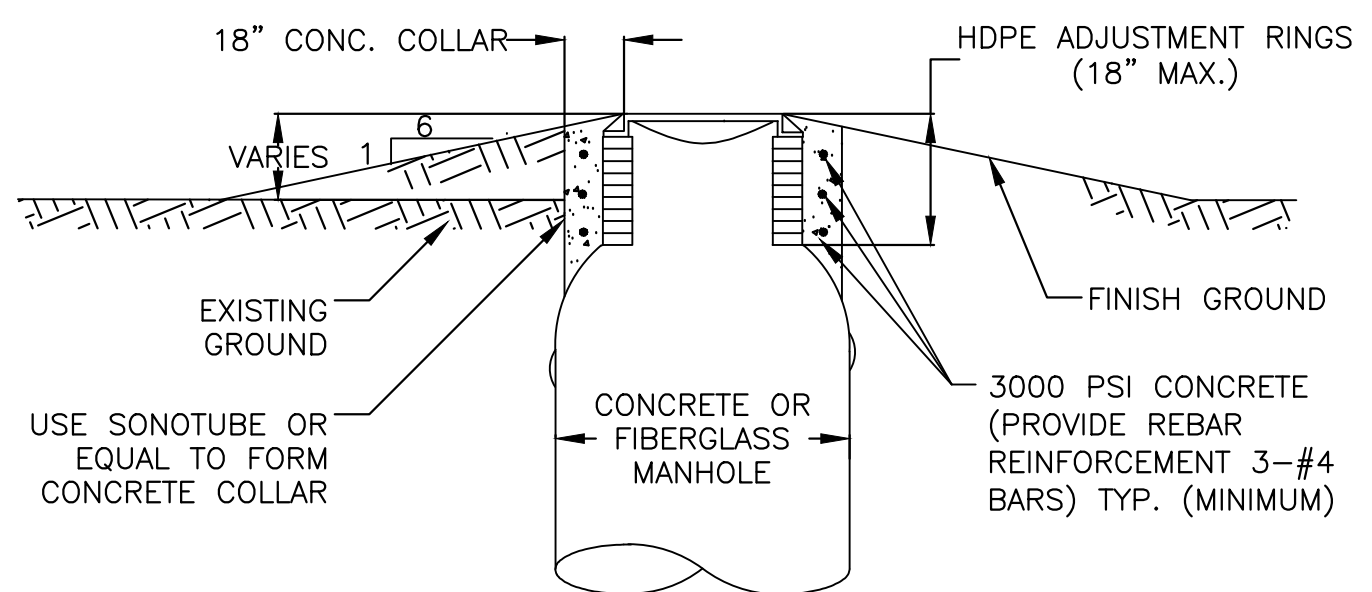
PIPE SEAL DETAIL

NOT TO SCALE



MANHOLE PROTECTION IN UNPAVED AREAS (CULTIVATED/SPECIAL)

NOT TO SCALE

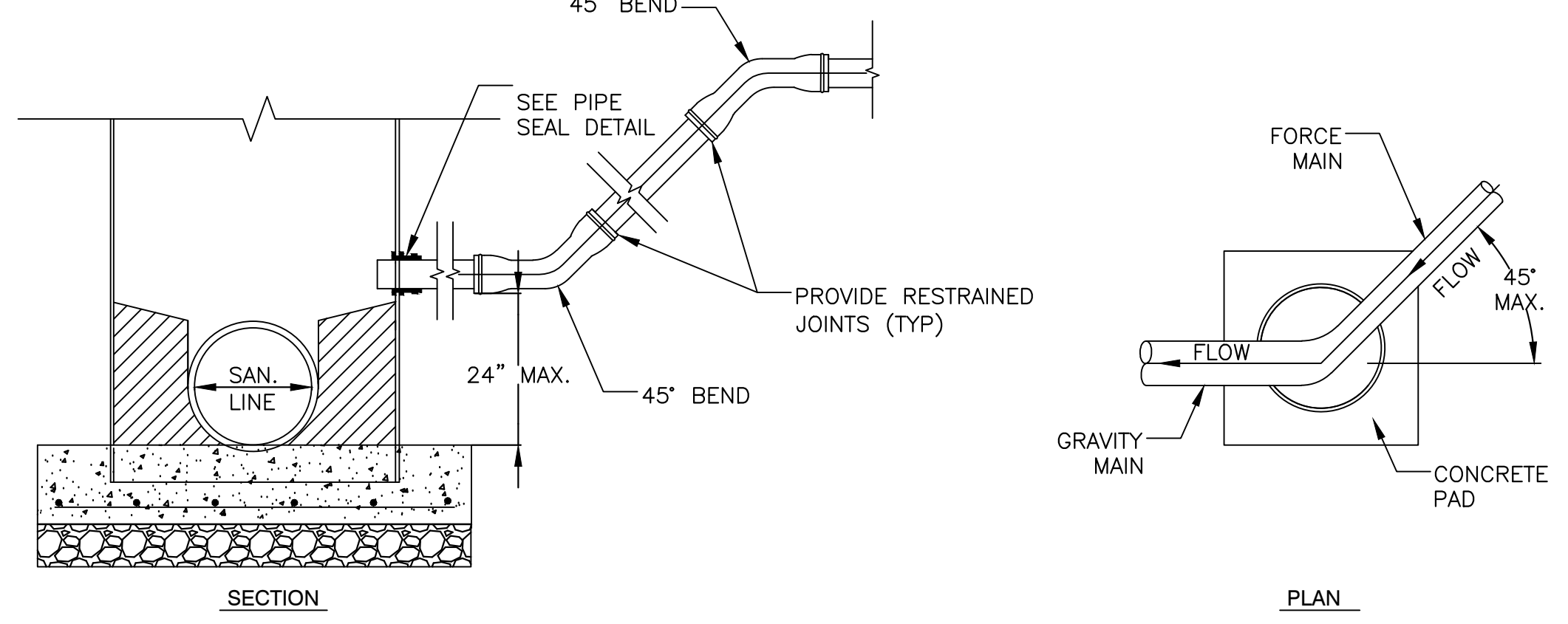


MANHOLE PROTECTION IN UNPAVED AREAS (RESIDENTIAL)

NOT TO SCALE

GENERAL WASTEWATER CONSTRUCTION NOTES:

1. THE CONTRACTOR SHALL VISIT THE SITE OF THE WORK AND EXAMINE LOCAL CONDITIONS TO BE ENCOUNTERED, IMPROVEMENTS THAT IS PROTECTED, AND PERMITS AND FEES TO BE REQUIRED, ALONG WITH OTHER RESEARCH THAT IS NECESSARY TO ENSURE THAT THE CONTRACTOR THOROUGHLY UNDERSTANDS THE PROJECT AND IS FULLY AWARE OF ALL THE CONDITIONS AND CONSTRAINTS THAT MAY BE ENCOUNTERED DURING THE COURSE OF CONSTRUCTION.
2. THE CONTRACTOR SHALL ADHERE TO ALL TCEQ REGULATIONS PER 30 TAC CHAPTER 217 AND TRENCH SAFETY FOR EXCAVATIONS.
3. THE CONTRACTOR IS RESPONSIBLE FOR ALL TRAFFIC CONTROL AND MUST ADHERE TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
4. ALL FIBERGLASS MANHOLES SHALL BE MONOLITHIC WITH 0.50" MINIMUM WALL THICKNESS. IF PROVIDED OR REQUIRED, FIBERGLASS BOTTOM SHALL BE DESIGNED TO WITHSTAND HYDROSTATIC HEAD PRESSURE UNDER ALL CONDITIONS.
5. THE MANHOLE WALL PENETRATIONS FOR PIPE (8"-15" DIAMETER PIPE) ABOVE THE FLOWLINE OF THE MANHOLE SHALL BE CORED AND SEALED WITH APPROVED SEAL GASKET WATER STOP ASSEMBLY.
6. FOR FIBERGLASS MANHOLES, THE MANHOLE FOUNDATION MAY BE PRECAST ON GROUND SURFACE. (PROCEDURE MUST BE SUBMITTED TO THE ENGINEERING SERVICES CONSTRUCTION ENGINEER FOR APPROVAL.)
7. THE CONTRACTOR SHALL PROVIDE PROTECTIVE COATING ON ALL EXPOSED CONCRETE SURFACES, INCLUDING CORBEL AREA, MANHOLE WALLS AND MANHOLE BENCH.
8. FOR FIBERGLASS MANHOLES WITH WATERTIGHT BOTTOM, ADHERE TO ALL MANUFACTURER REQUIREMENTS. FIBERGLASS BOTTOM AND BENCH MUST ALSO BE FACTORY INSTALLED.



FORCE MAIN DISCHARGE MANHOLE DETAIL

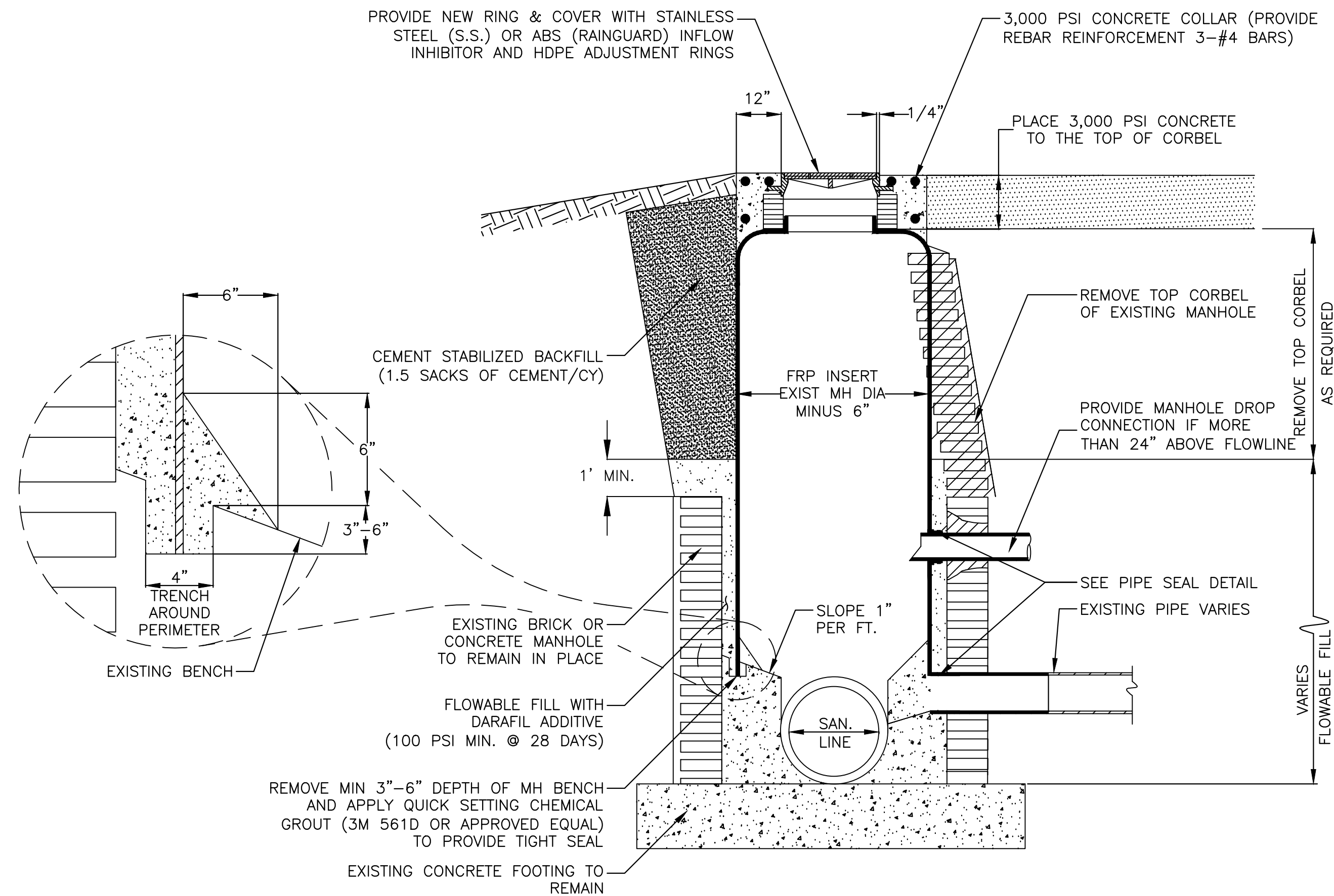
NOT TO SCALE

- NOTES:
1. ALL BENDS SHALL BE DUCTILE IRON WITH RESTRAINED JOINTS.
 2. INFLUENT FORCE MAIN MUST BE NO MORE THAN 45° FROM PARALLEL WITH DOWNSTREAM FLOW DIRECTION.

DESCRIPTION	BY	DATE	REVISION NO.
CITY OF CORPUS CHRISTI TEXAS Department of Engineering Services			
CITY OF CORPUS CHRISTI WASTEWATER STANDARD DETAILS MANHOLE INSTALLATION			
SHEET _____ of _____ RECORD DRAWING NO.			
CITY PROJECT # _____			

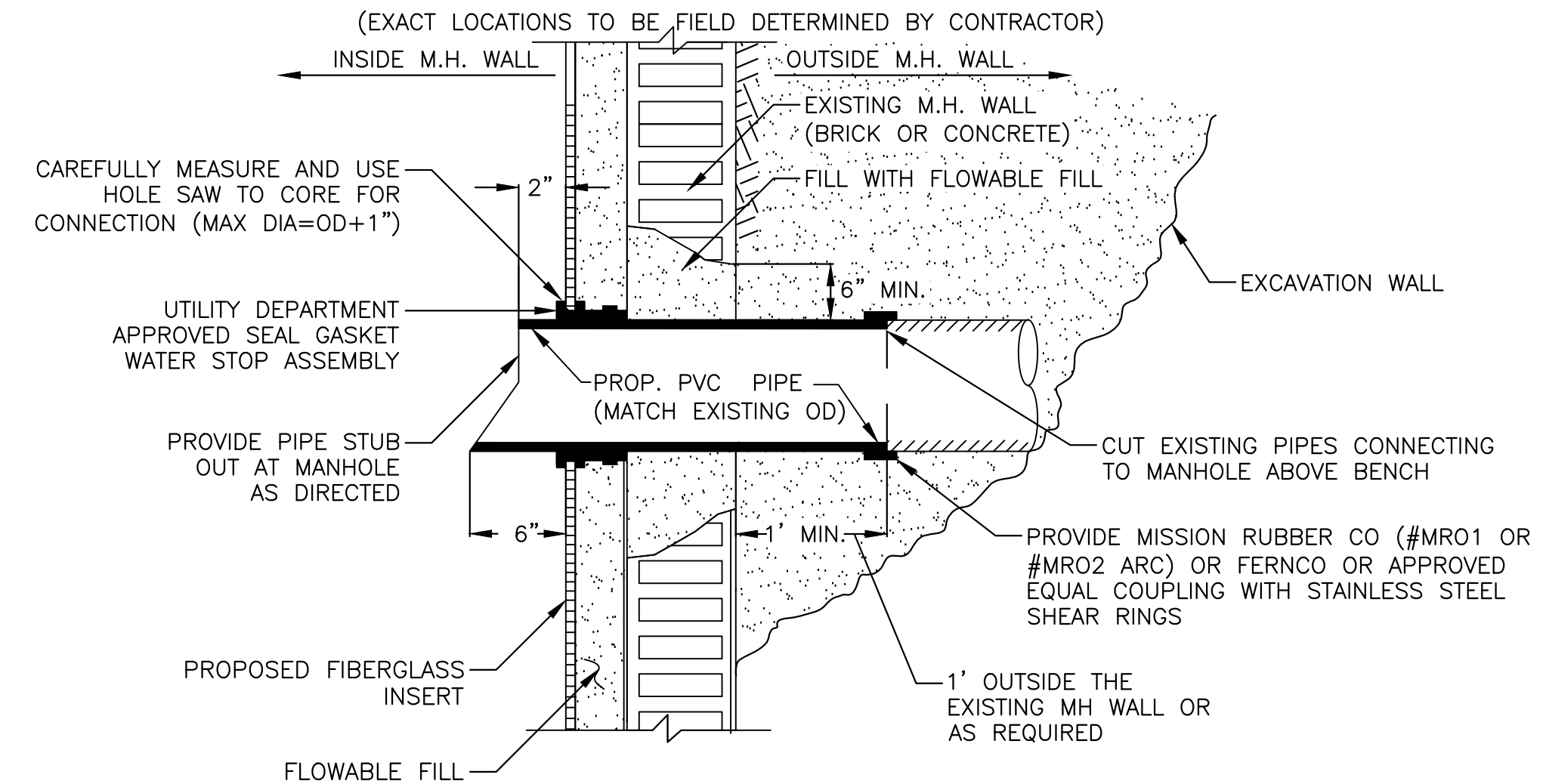
FRP INSERT REHABILITATION OF EXISTING MANHOLE NOTES:

1. THE 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.
2. PRIOR TO INSTALLING CONTROL OF FLOW OR INITIATING MANHOLE REPAIRS, THE CONTRACTOR SHALL PLACE BARRICADES AND SIGNS TO DIVERT TRAFFIC AND PEDESTRIANS PER THE APPROVED TRAFFIC CONTROL PLAN, AS REQUIRED.
3. THE CONTRACTOR SHALL PREPARE THE INTERIOR OF THE EXISTING FOUNDATION STRUCTURE BY REMOVING ALL DEFECTIVE GROUT AND DEBRIS/BLOCKAGES, MECHANICALLY ROUGHEN THE ENTIRE INVERT, AND CLEAN THE INTERIOR WITH A HIGH-PRESSURE WATER JET.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DISPOSAL OF THE RESULTING SLUDGE AND DEBRIS AT AN APPROVED SITE, ACCORDING TO ALL PERTINENT WASTE DISPOSAL REGULATIONS.
5. THE CONTRACTOR SHALL USE QUICK-SETTING, NON-SHRINK CONCRETE GROUT TO SEAL AND RESHAPE THE BOTTOM. SUBMIT PROPOSED MATERIALS TO BE USED TO THE ENGINEER FOR APPROVAL.
6. PROVIDE COATING TO EXPOSED CONCRETE SURFACES WITH APPROVED SYSTEM TO PREVENT CORROSION.
7. FRP INSERT SHALL COMPLY WITH ASTM D3753 WITH SINGLE PIECE MONOLITHIC BARREL AND CORBEL CONSTRUCTION WITHOUT SEAMS, JOINTS OR SECTIONS. WALL THICKNESS SHALL PROVIDE AN AASHTO H-20 LOAD RATING AND WALL STIFFNESS OF 36 PSI MIN.
8. CUT BOTTOM OF FRP INSERT TO FIT EVENLY ON BENCHES OR CHIP BENCHES OUT TO EVENLY SUPPORT INSERT.
9. SEAL ANNULAR SPACE AROUND EXIST LINES WITH JUTE ROPE AND CHEMICAL GROUT.



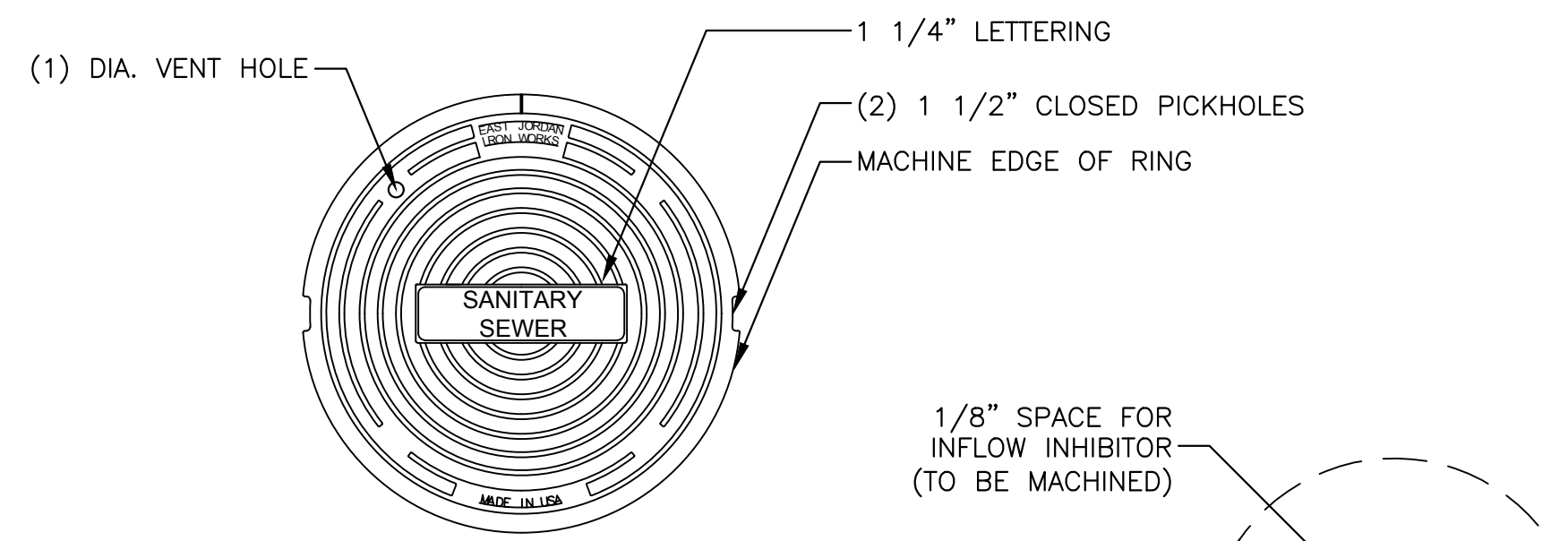
FRP INSERT REHABILITATION OF EXISTING MANHOLE

NOT TO SCALE



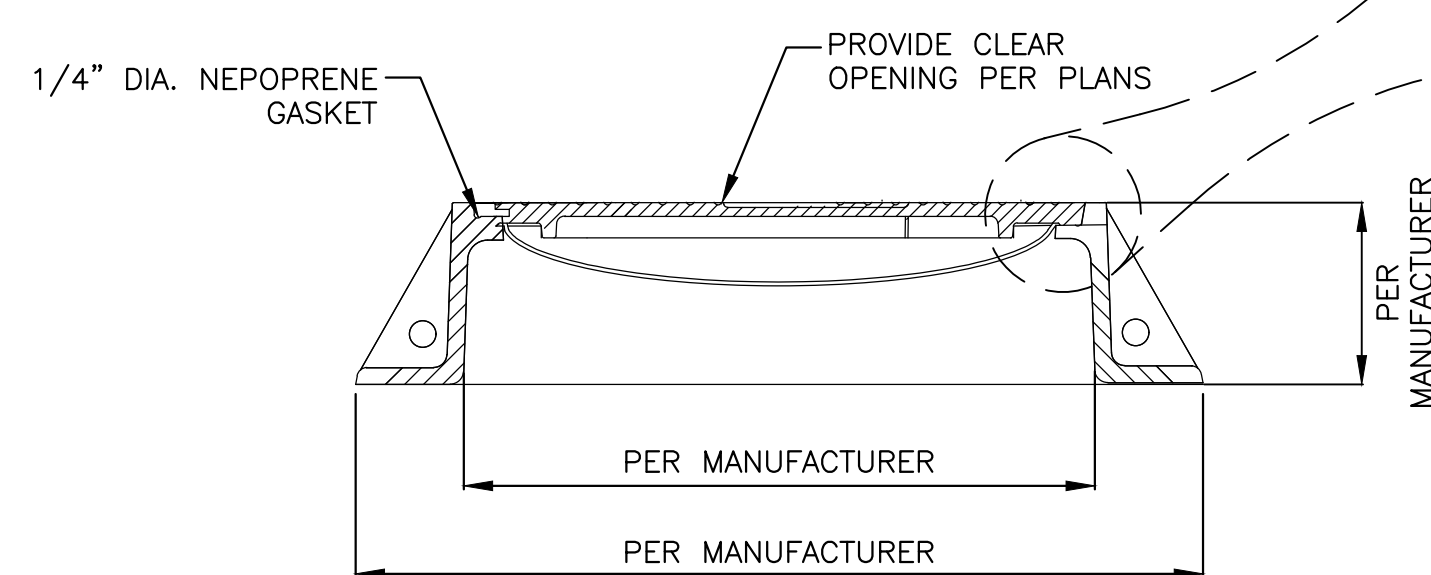
FRP INSERT PIPE SEAL DETAIL

NOT TO SCALE



COVER PLAN VIEW

NOT TO SCALE



SECTION OF RING & COVER

NOT TO SCALE

ROADWAY MANHOLE RING AND COVER:

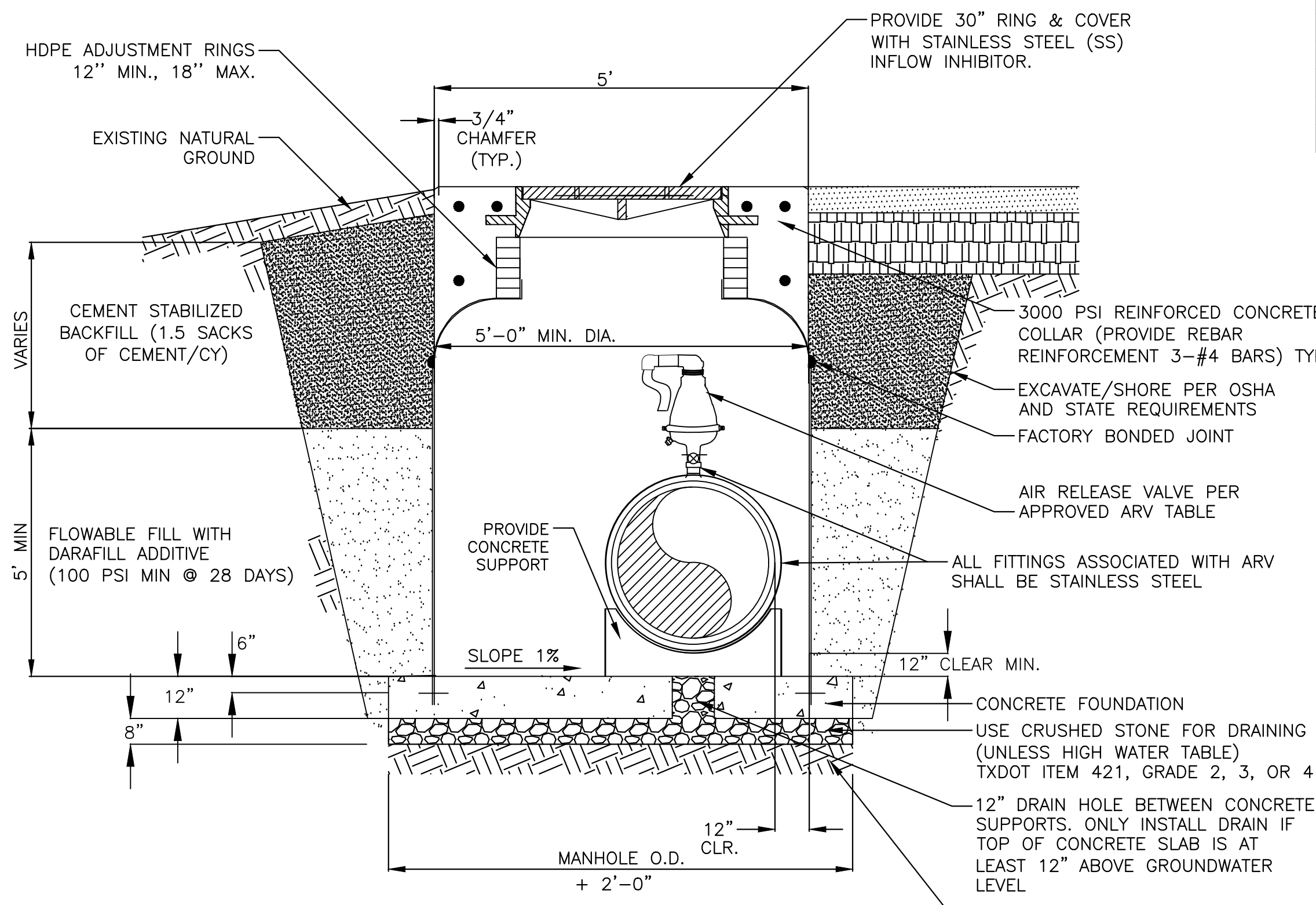
1. THE CONTRACTOR SHALL PROVIDE STAINLESS STEEL (S.S.) INFLOW INHIBITOR WITH SS TETHER SECURED TO MANHOLE WALL, SUCH THAT THE INNER LID IS FLUSH WITH THE OUTER LID.
2. TRAFFIC SHALL BE RESTRICTED FROM MANHOLE FOR 48 HOURS AFTER THE PLACEMENT OF CONCRETE, AND COLLAR SHALL PROVIDE A SUFFICIENT, CLEAR OPENING TO ACCOMMODATE THE SPECIFIED MANHOLE COVER.
3. AASHTO-M-306 (LATEST REVISION) PROOF LOAD TESTING IS REQUIRED (40,000 LBS) AND MUST BE INSPECTED. PRIOR TO INSTALLATION, THE RESULTS OF THE TEST SHALL BE SUBMITTED TO THE CITY.
4. THE MANUFACTURING FACILITIES FOR ALL PROVIDED RING AND COVER ASSEMBLIES SHALL MEET OR EXCEED ALL EPA ENVIRONMENTAL STANDARDS AND OSHA SAFETY STANDARDS. THE CASTINGS SHALL BE MANUFACTURED FROM RECYCLED MATERIALS. THE CONTRACTOR SHALL PROVIDE CERTIFICATION.

CLEAR OPENING	MANUFACTURER (1)	MODEL NUMBER*	INFLOW INHIBITOR
24"	EAST JORDAN IRON WORKS	V-1168	REQUIRED ON ALL INSTALLATIONS PER CITY SPECIFICATIONS
	U.S. FOUNDRY	COVER- #8018538 FRAME- #8022247	
	NEENAH FOUNDRY	R-1930-24	
30" (2)	EAST JORDAN IRON WORKS	COVER- V1430 FRAME- V1420	
	U.S. FOUNDRY	COVER- #9210048 FRAME- #8021361	
	NEENAH FOUNDRY	DF-1274	

(1) OR APPROVED EQUAL (MADE IN THE USA)
 (2) UNLESS NOTED IN THE PLANS, ALL COVERS SHALL BE 24" DIAMETER AND NOT INTENDED FOR MANNED ENTRY.

RING & COVER APPROVED LIST

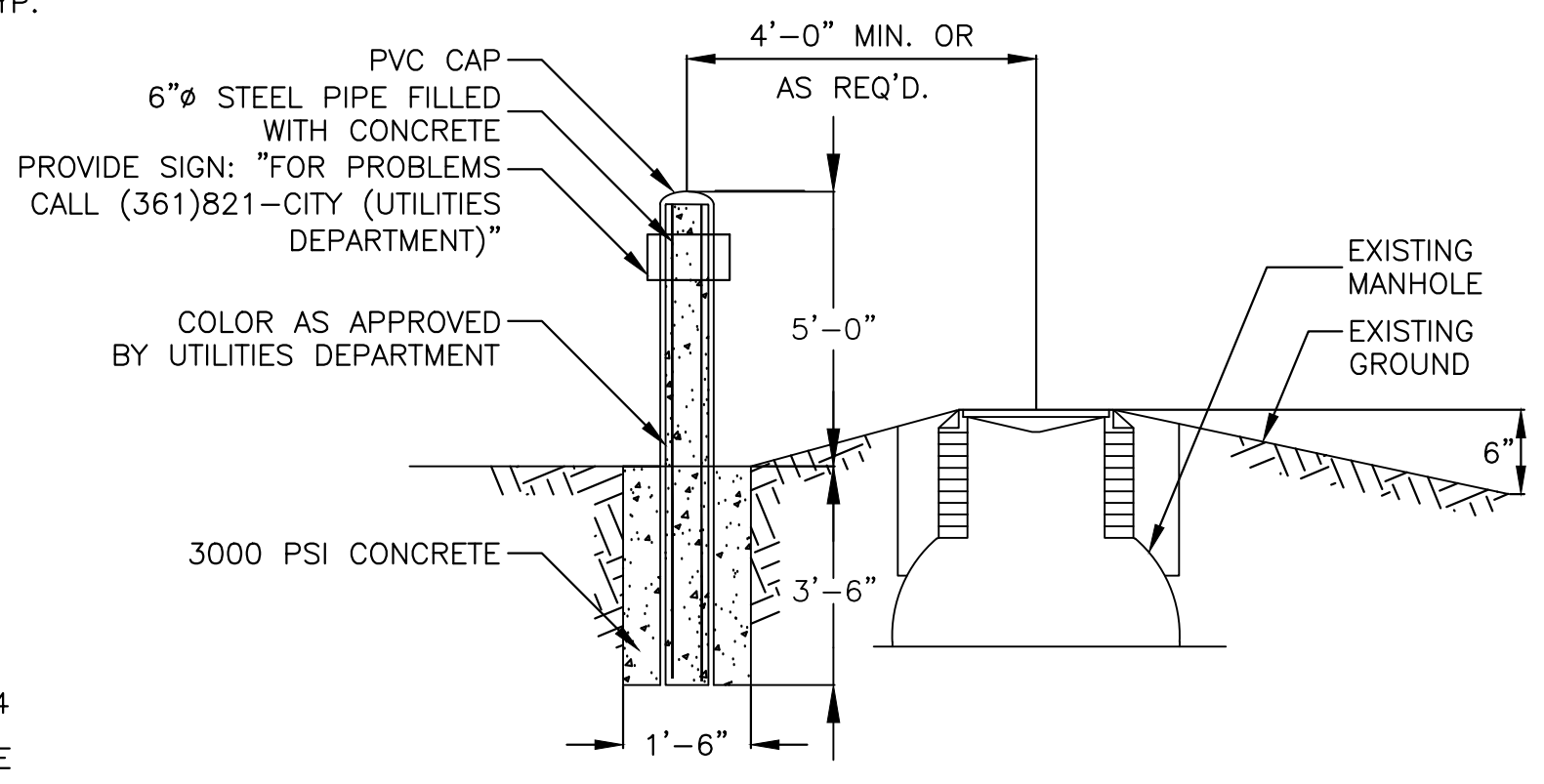
REVISION NO.	DATE	BY	DESCRIPTION



AIR RELEASE VALVE AND MANHOLE

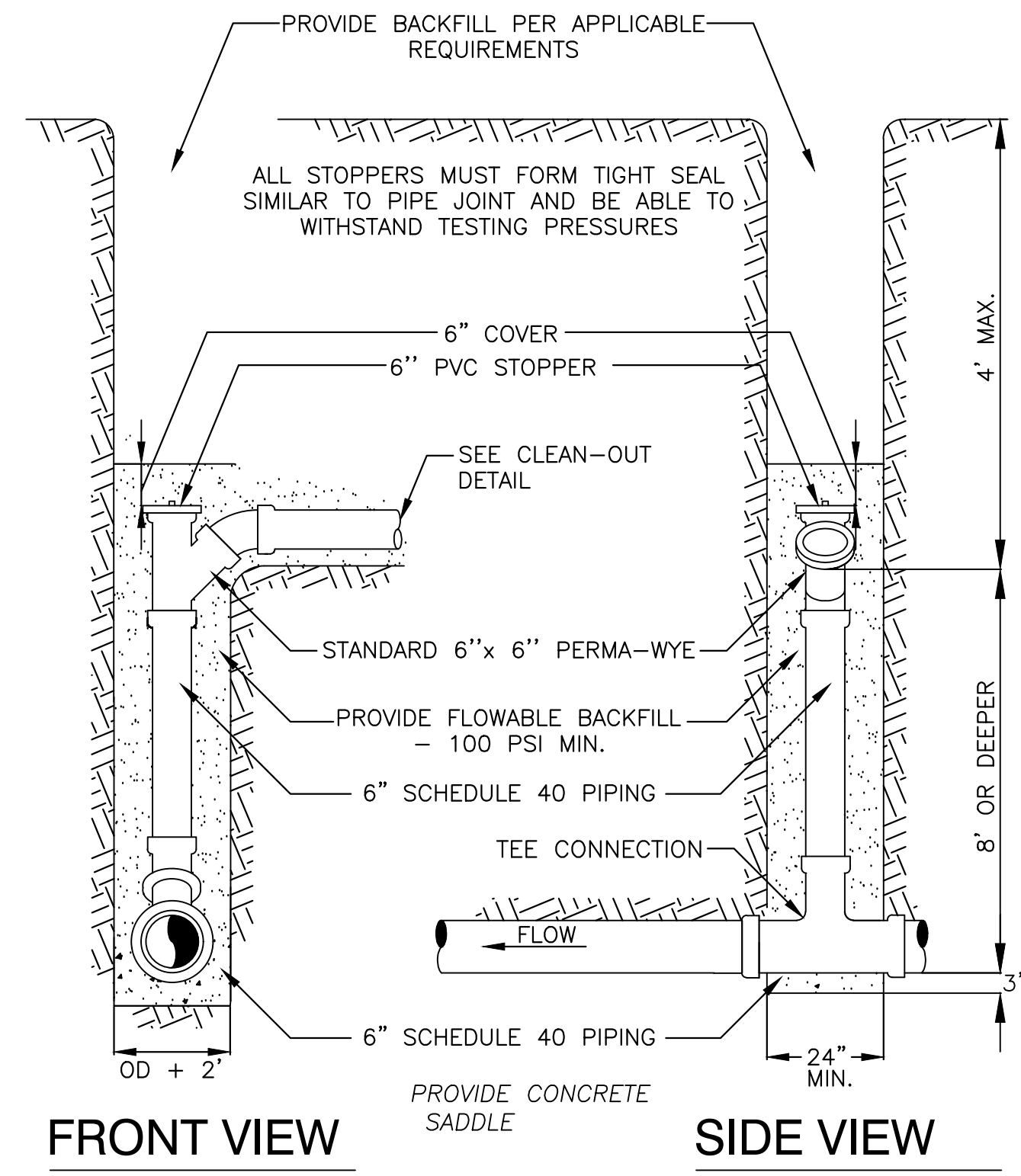
NOT TO SCALE

APPROVED ARVs		
MANUFACTURER	MODEL NAME	MATERIAL
A.R.I.	D-025 OR D-025 SHORT	316 SS
H-TEC	MODEL 986 (SS) AND 988	
VENT OMAT	MODEL RGXII (ST. STEEL)	
VALMATIC	VM 48AS OR VM 49AS	



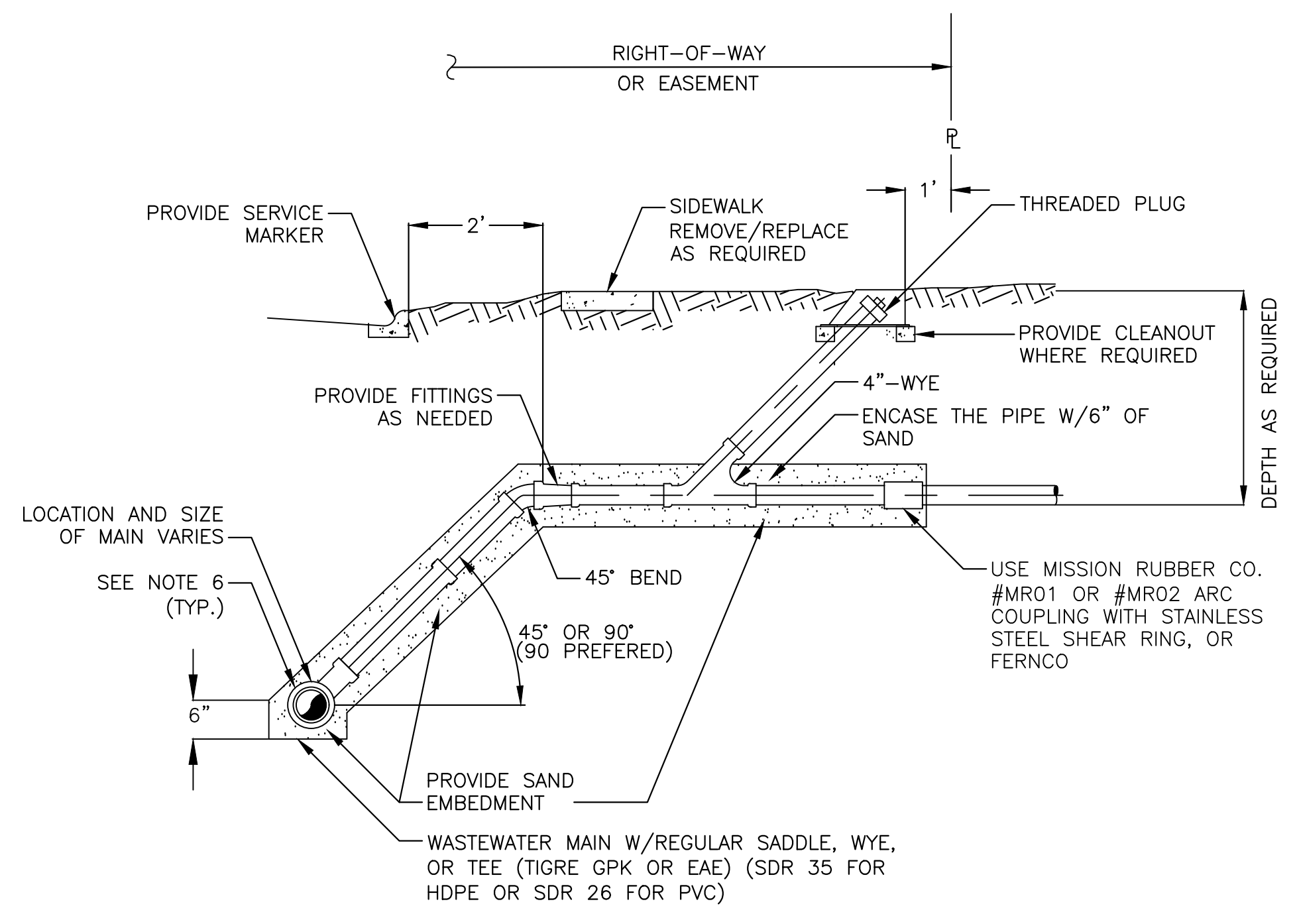
BOLLARD DETAIL

NOT TO SCALE



DEEP CUT SERVICE CONNECTION

NOT TO SCALE

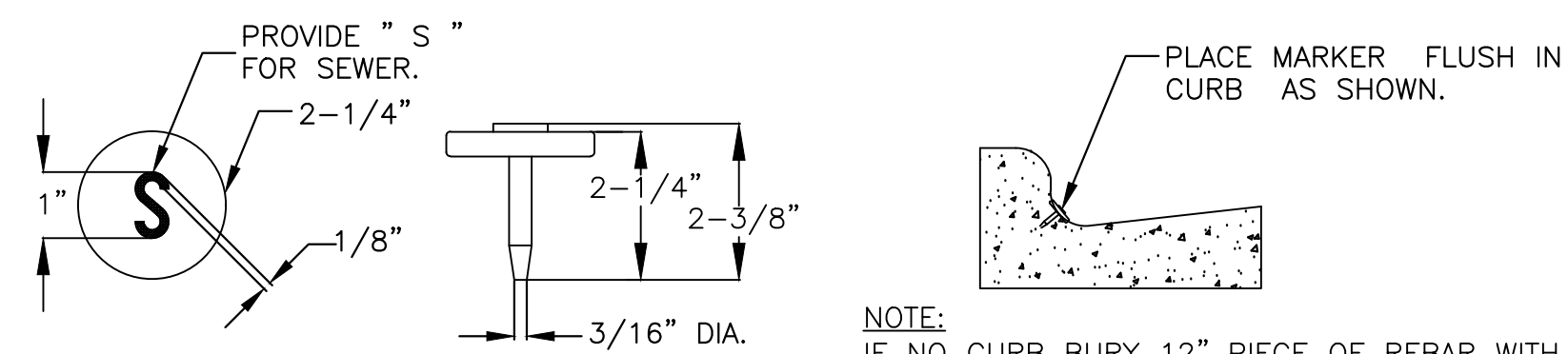


SERVICE CONNECTION DETAILS

NOT TO SCALE

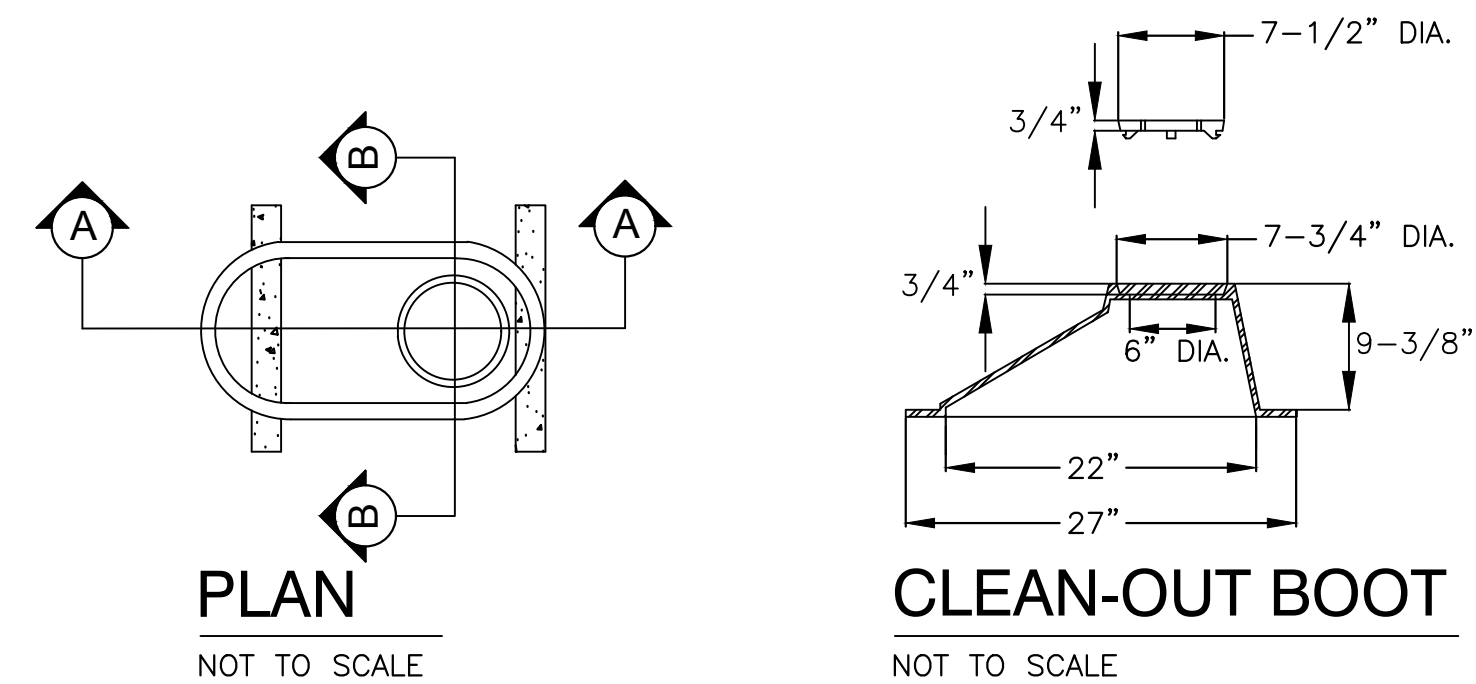
SERVICE CONNECTION NOTES:

- CONTRACTOR TO PROVIDE SERVICE CONNECTION TAP TO THE R.O.W. LINE & CONNECT EXIST. SERVICE LINE OUTSIDE EASEMENT AS SHOWN AND REQUIRED.
- ALL SERVICE PIPE AND FITTINGS TO BE SOLVENT WELD SCH 40 PVC UNLESS SHOWN OTHERWISE IN THE PLANS.
- FOR EXISTING MAIN PIPE MATERIAL - PVC AND/OR VCP USE UTILITY DEPARTMENT APPROVED CONNECTOR.
- FOR NEW PVC MAIN AND SERVICE, USE PVC WYE OR TEE AS DIRECTED AT SERVICE CONNECTION.
- IF PIPE LENGTH, ON SERVICE LINE, IS GREATER THAN 50', USE 6" PVC SCH 40 FROM CLEANOUT WYE TO THE MAIN LINE.



STANDARD SERVICE MARKER

BRASS - ONE REQUIRED EACH STREET TAP
NOT TO SCALE

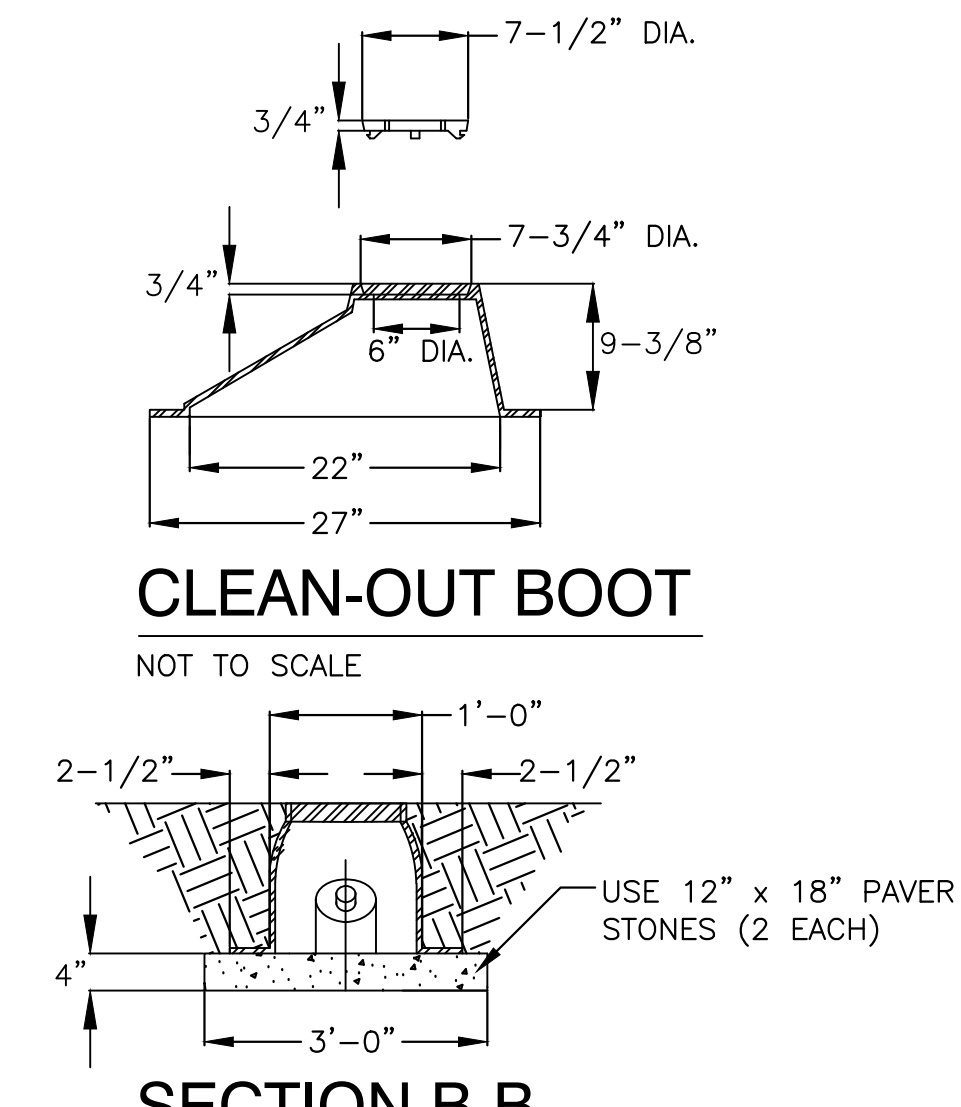


SECTION A-A

NOT TO SCALE

TYPICAL CAST IRON CLEAN-OUT BOOT

NOT TO SCALE



SECTION B-B

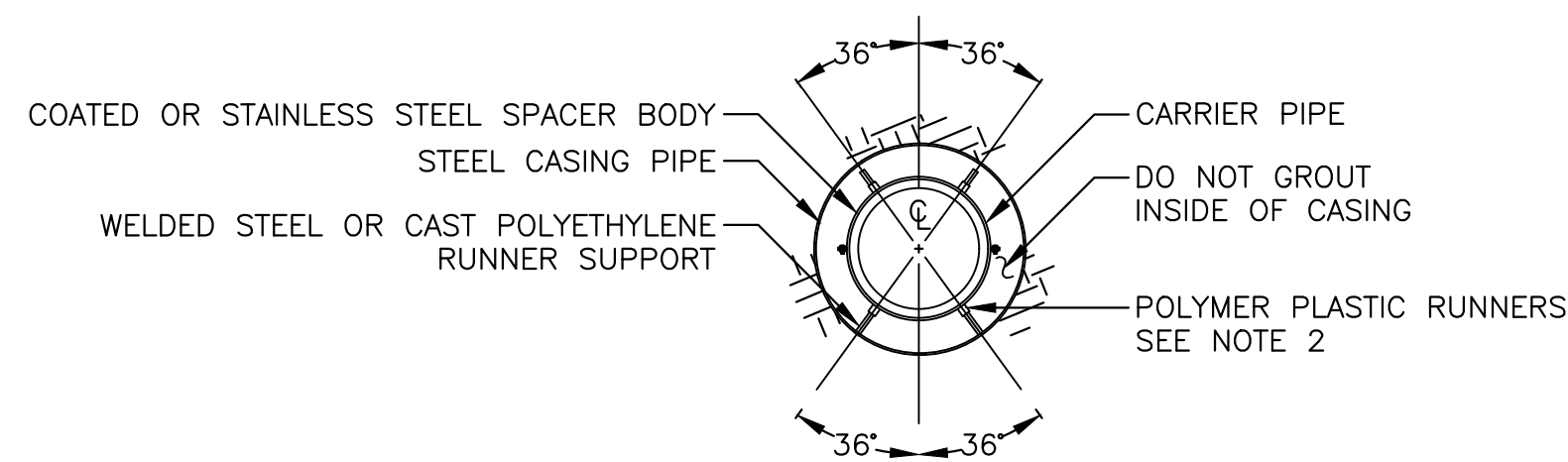
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REVISION NO. DATE BY DESCRIPTION

CITY OF CORPUS CHRISTI TEXAS
Department of Engineering Services

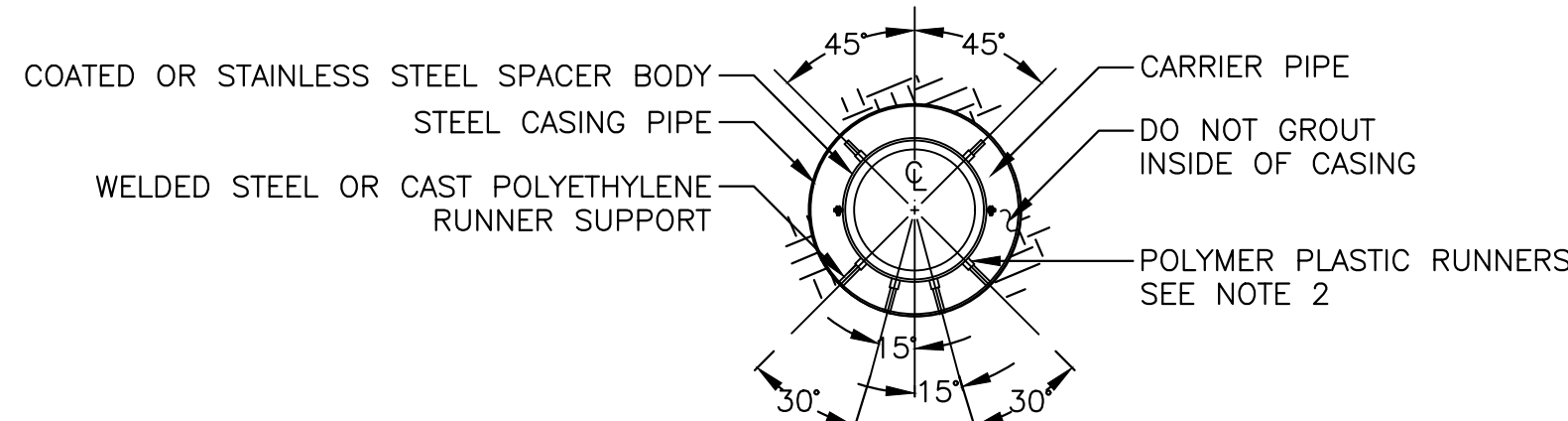
CITY OF CORPUS CHRISTI
WASTEWATER STANDARD DETAILS
AIR RELEASE VALVE, BOLLARD AND SERVICE CONNECTION DETAILS

SHEET ____ of ____
RECORD DRAWING NO.
CITY PROJECT #



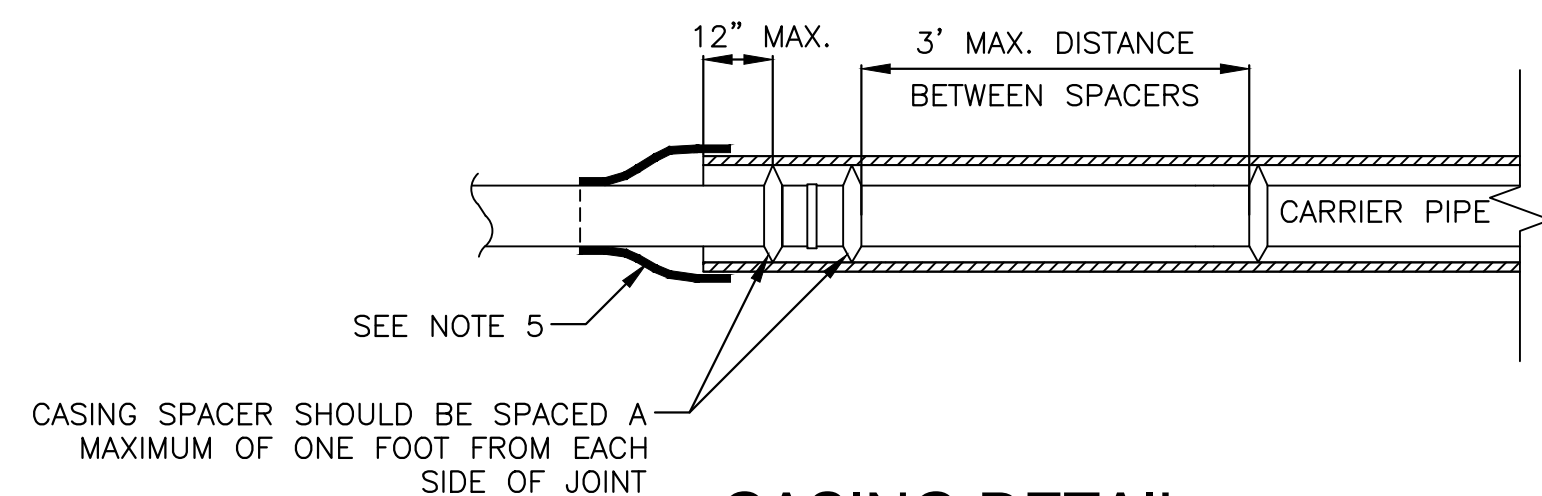
4" TO 10" CASING DETAIL

NOT TO SCALE



12" TO 36" CASING DETAIL

NOT TO SCALE

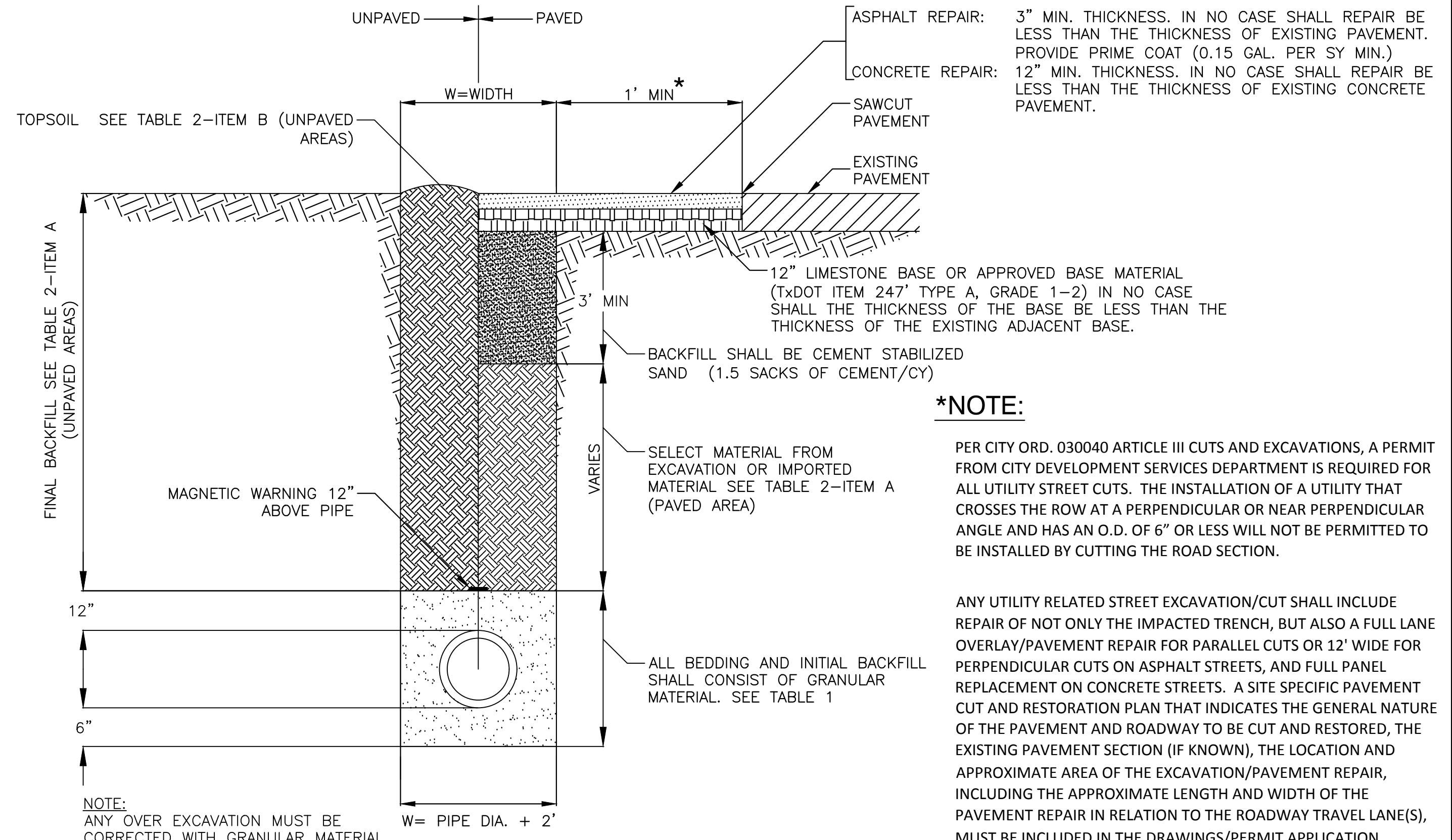


CASING DETAIL

NOT TO SCALE

CASING NOTES:

- CASING DIAMETER, LENGTH, LOCATION, AND WALL THICKNESS SHALL BE PER PROJECT SPECIFIC REQUIREMENTS. (MINIMUM SCHEDULE 40)
- ALL CARRIER PIPES IN INSTALLED CASINGS SHALL BE SUPPORTED BY BOLT-ON STYLE CASING SPACERS ("ADVANCED PRODUCTS" OR APPROVED EQUAL).
- THE CONTRACTOR SHALL PROVIDE MECHANICALLY RESTRAINED JOINTS FOR FORCE MAINS ONLY ON CARRIER PIPES. "MEGALUG" TYPE JOINT RESTRAINTS OR APPROVED EQUAL SHALL BE USED.
- 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 THE MAXIMUM O.D. OF THE CARRIER PIPE AND THE CASING WALL.
 - POSITIONING OF THE 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. THE MAXIMUM SPACING OF THE CASING SPACERS SHALL BE 3 FEET.
- THE TWO ENDS OF THE CASING PIPE SHALL BE SEALED WATERTIGHT WITH AN ADVANCED PRODUCTS SYSTEM, INC. MODEL AZ - ZIPPER, PSI MODEL C END SEAL, OR AN APPROVED EQUAL.



TRENCH BACKFILL FOR WASTEWATER LINES AND PAVEMENT REPAIR FOR UTILITIES

NOT TO SCALE


***NOTE:**

PER CITY ORD. 030040 ARTICLE III CUTS AND EXCAVATIONS, A PERMIT FROM CITY DEVELOPMENT SERVICES DEPARTMENT IS REQUIRED FOR ALL UTILITY STREET CUTS. THE INSTALLATION OF A UTILITY THAT CROSSES THE ROW AT A PERPENDICULAR OR NEAR PERPENDICULAR ANGLE AND HAS AN O.D. OF 6" OR LESS WILL NOT BE PERMITTED TO BE INSTALLED BY CUTTING THE ROAD SECTION.

ANY UTILITY RELATED STREET EXCAVATION/CUT SHALL INCLUDE REPAIR OF NOT ONLY THE IMPACTED TRENCH, BUT ALSO A FULL LANE OVERLAY/PAVEMENT REPAIR FOR PARALLEL CUTS OR 12' WIDE FOR PERPENDICULAR CUTS ON ASPHALT STREETS, AND FULL PANEL REPLACEMENT ON CONCRETE STREETS. A SITE SPECIFIC PAVEMENT CUT AND RESTORATION PLAN THAT INDICATES THE GENERAL NATURE OF THE PAVEMENT AND ROADWAY TO BE CUT AND RESTORED, THE EXISTING PAVEMENT SECTION (IF KNOWN), THE LOCATION AND APPROXIMATE AREA OF THE EXCAVATION/PAVEMENT REPAIR, INCLUDING THE APPROXIMATE LENGTH AND WIDTH OF THE PAVEMENT REPAIR IN RELATION TO THE ROADWAY TRAVEL LANE(S), MUST BE INCLUDED IN THE DRAWINGS/PERMIT APPLICATION.

GENERAL NOTES FOR BACKFILL

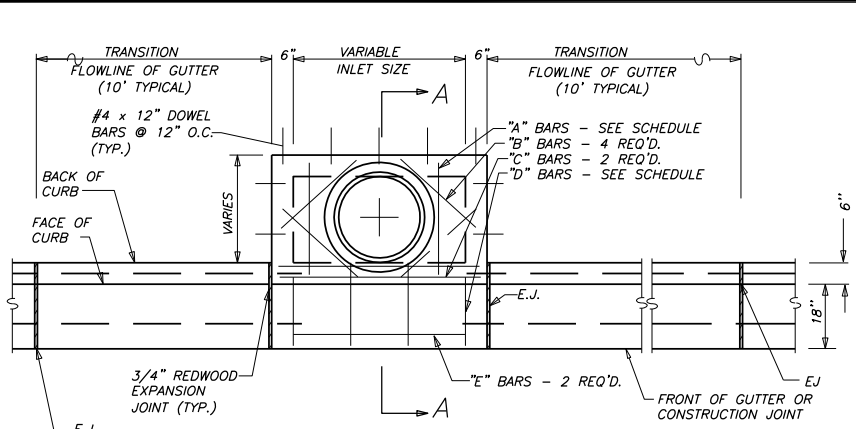
TABLE 1 BEDDING AND INITIAL BACKFILL (BELOW PIPE TO 12" ABOVE PIPE)		TABLE 2 FINAL BACKFILL (GREATER THAN 12" ABOVE PIPE)	
		UNPAVED AREAS	PAVED AREAS
ALL BEDDING AND INITIAL BACKFILL SHALL CONSIST OF THE FOLLOWING OR REFER TO DESIGN ENGINEER REQUIREMENTS: GRANULAR BACKFILL CONSISTING OF EITHER NATURAL SAND OR SANDY GRAVEL, OR MATERIAL PRODUCED BY CRUSHING OF NATURAL STONE OR GRAVEL:		A. FROM 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.	
① EXCAVATIONS <20 FT. 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.		A. 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 EXISTING ADJACENT TOP-SOIL THICKNESS. (CONSTRUCTION TO BE PERFORMED BY "DOUBLE DITCH" METHOD-TOP SOIL SALVAGED TO BE PLACED ON TOP)	
② IN DEEP EXCAVATIONS (>20') OR BELOW WATER TABLE, USE CRUSHED STONE OR CRUSHED GRAVEL MEETING GRADATION OF: A. CONCRETE COARSE AGGREGATE; TxDOT ITEM 421; GRADE 2, 3, OR 4. OR B. CRUSHED LIMESTONE PER TxDOT ITEM 421' GRADE 2, 3, OR 4.		A. FROM 12" ABOVE PIPE TO 3' BELOW BOTTOM OF ROAD BASE: BACKFILL SHALL BE SELECT MATERIAL FROM EXCAVATION OR IMPORTED MATERIAL. IN EITHER CASE, ALL MATERIAL 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 12" MAX OR IF SELECT MATERIAL FROM EXCAVATION DOES NOT MEET REQUIREMENTS, THEN USE CEMENT STABILIZED SAND. SEE TABLE 2-ITEM B BELOW. B. FROM 3' BELOW BOTTOM OF ROAD BASE TO BOTTOM OF ROAD BASE: BACKFILL SHALL BE CEMENT STABILIZED SAND (1.5 SK/C.Y.) AND SHALL MEET THE FOLLOWING REQUIREMENTS: SAND GRADATION: % PASSING #4 55-100 #10 40-100 #40 25-100 #200 10-20 PI NP-10 COMPACT TO 95% OF D588. MOISTURE TO BE ADJUSTED TO (+/-2%) OF OPTIMUM.	


CITY OF CORPUS CHRISTI
 TEXAS
 Department of Engineering Services

CITY OF CORPUS CHRISTI
 WASTEWATER STANDARD DETAILS
 PAVEMENT REPAIR/BACKFILL/GENERAL NOTES/CASING DETAILS
 4 OF 4

SHEET ____ of ____
 RECORD DRAWING NO. _____
 CITY PROJECT # _____

REVISION NO.	DATE	BY	DESCRIPTION

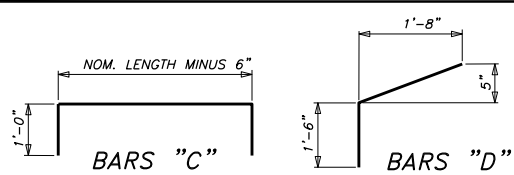


PLAN OF 5' STANDARD INLET

NOT TO SCALE

SPECIAL NOTE:

1. CONTRACTOR TO PROVIDE #4 x 12" DOWELS @ 12" O.C. WHERE PROP. SIDEWALK ABUTS INLET. (NO SEPARATE PAYMENT)
2. FOR CURB INLET THROAT EXTENSION DETAILS REFER TO STORM WATER STANDARD DETAIL SHEET 3 OF 3.

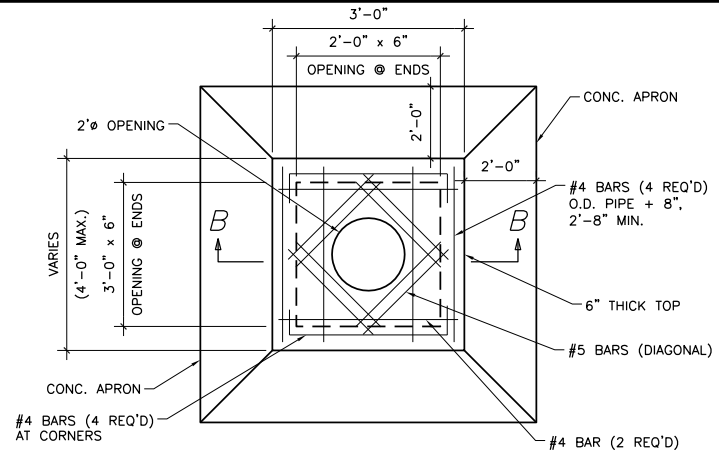


** THROAT OPENINGS SHALL HAVE A 6" X 6" CONCRETE SUPPORT PLACED AT MID-THROAT

* NOMINAL LENGTH OF INLET SHALL BE DESIGNATED AS THE CLEAR WIDTH OPENING.

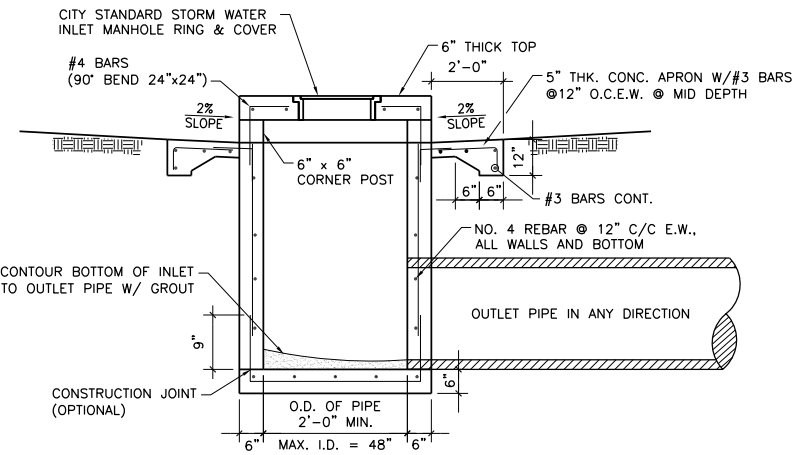
STANDARD CURB INLET STEEL SCHEDULE					
ALL BARS No. 4 PREFORMED					
INLET SIZE (Nom. Length)	NO. REQ'D./LENGTH				
	"A" BARS	"B" BARS	"C" BARS	"D" BARS	"E" BARS
4'	2/0	4/1'-10"	2/5'-6"	4/3'-2"	2/4'-6"
5'	2/0	4/3'-2"	2/6'-6"	4/3'-2"	2/5'-6"
6'	4/0	4/4'-0"	2/7'-6"	6/3'-2"	2/6'-6"
8'	4/0	4/4'-0"	2/9'-6"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



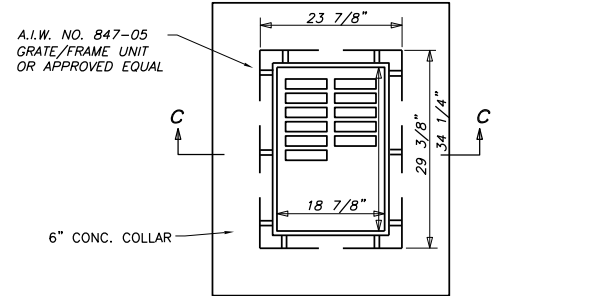
PLAN OF POST INLET

NOT TO SCALE



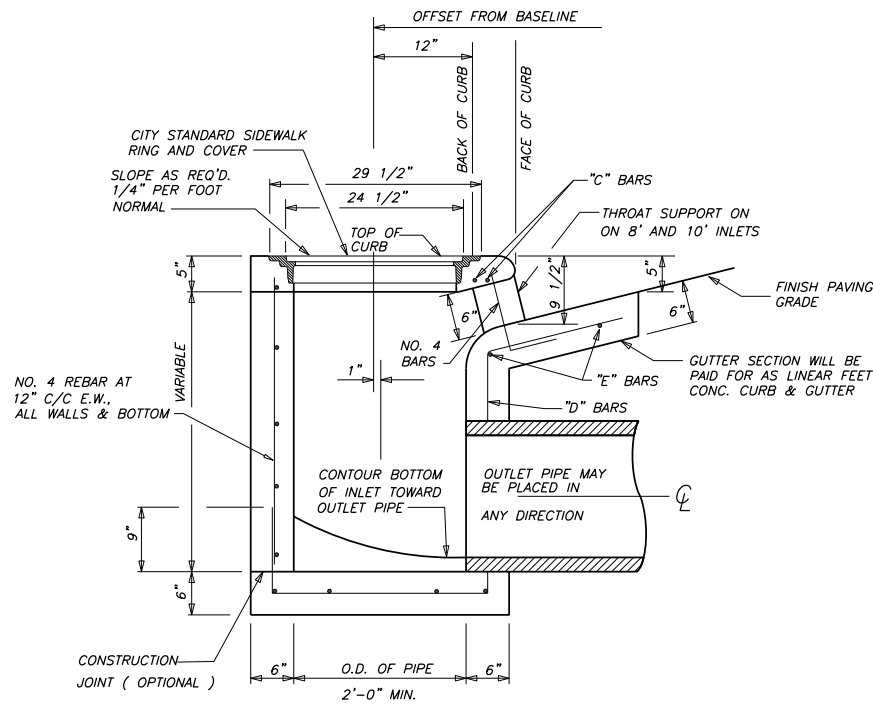
SECTION B-B

NOT TO SCALE



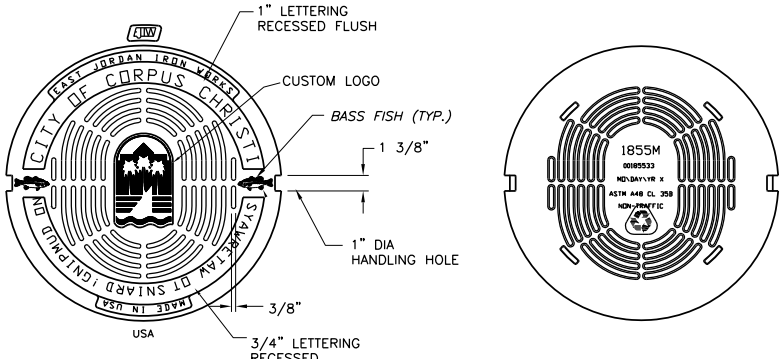
PLAN OF STANDARD GRATE INLET

NOT TO SCALE



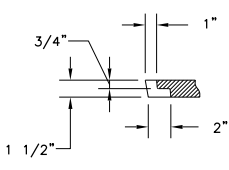
SECTION A-A

NOT TO SCALE

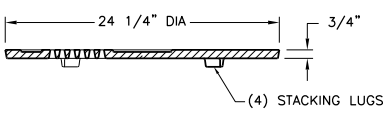


PLAN VIEW

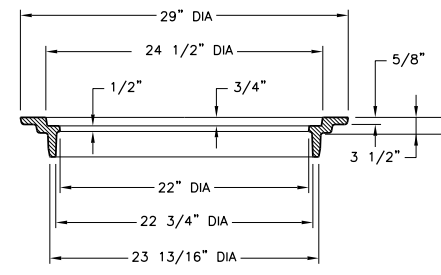
GRATE BLOCK



PICKSLOT DETAIL



GRATE SECTION



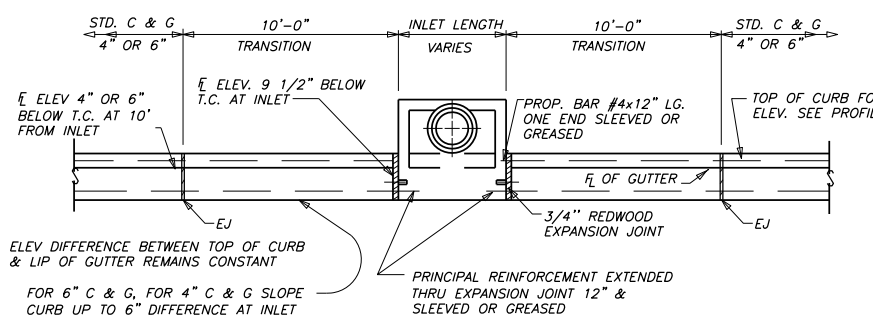
RING SECTION

CITY STANDARD INLET AND SIDEWALK MANHOLE RING & COVER CASTING DETAILS

NOT TO SCALE

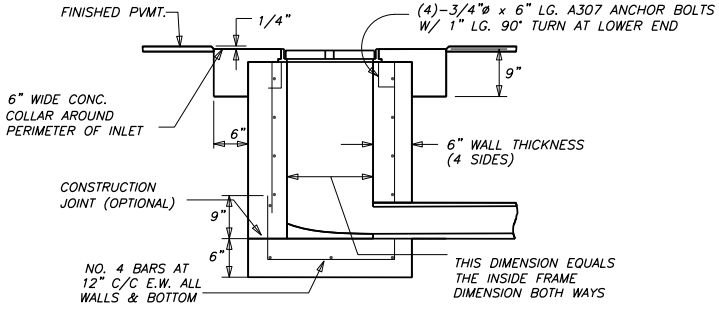
INLET AND SIDEWALK MANHOLE RING & COVER NOTES

1. MANHOLE RING & COVER SHALL BE EAST JORDAN MANHOLE ASSEMBLY FOR LOAD RATING NON-TRAFFIC.
2. THESE DETAILS SHOW GREY-IRON CASTINGS, FILLETED AT ANGLES WITH SHARP ARISES.
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.



FLOWLINE TRANSITION AT INLET FOR 4" OR 6" STD. CURB AND GUTTER


NOT TO SCALE



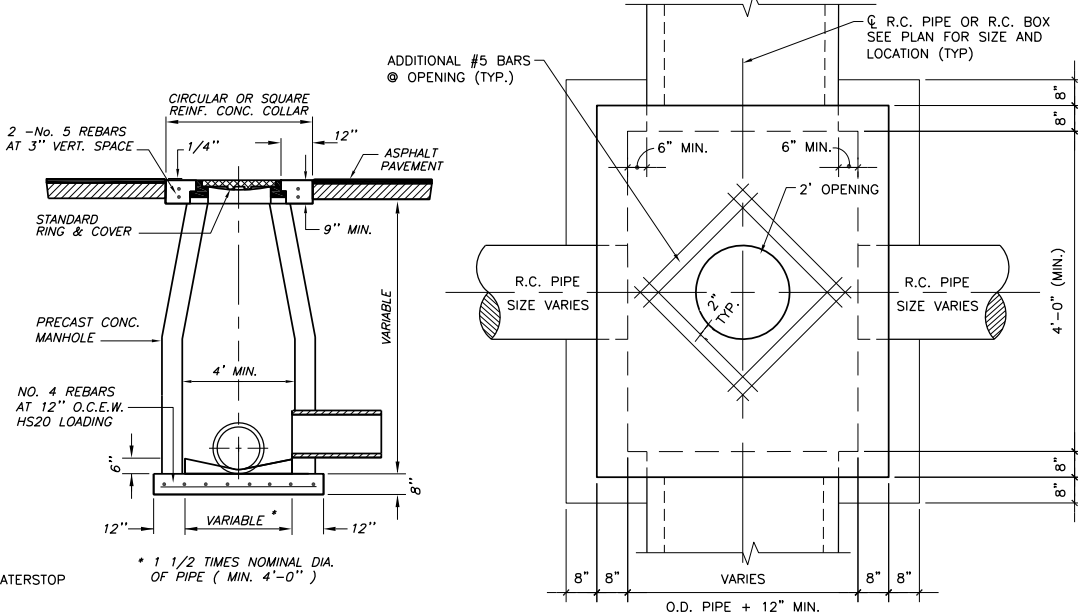
SECTION C-C

NOT TO SCALE

REVISION NO.	DATE	BY	DESCRIPTION


CITY OF CORPUS CHRISTI
 TEXAS
 Department of Engineering Services

CITY OF CORPUS CHRISTI
STORM WATER STANDARD DETAILS
 1 OF 3
 SHEET _____ of _____
 RECORD DRAWING NO. _____
 CITY PROJECT # _____

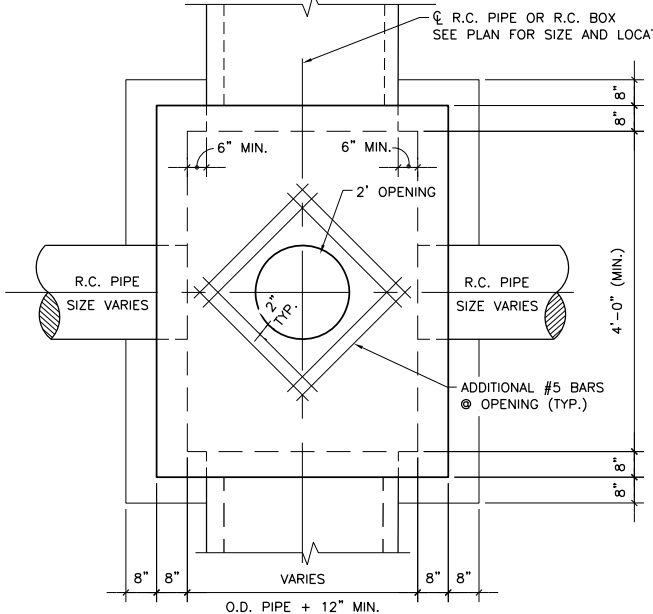


PRE-CAST CONC. MANHOLE NOTES:
 HS20 LOADING
 CONCRETE 28 DAY COMPRESSIVE STRENGTH - 5000 PSI
 REINFORCEMENT STEEL - 60,000 PSI
 REBAR MIN. SPLICE LENGTHS: #4-22" #5-28" #6-33"
 MANHOLE WALL/RISER REINFORCED PER ASTM C-478

KEYWAY DETAIL
NOT TO SCALE

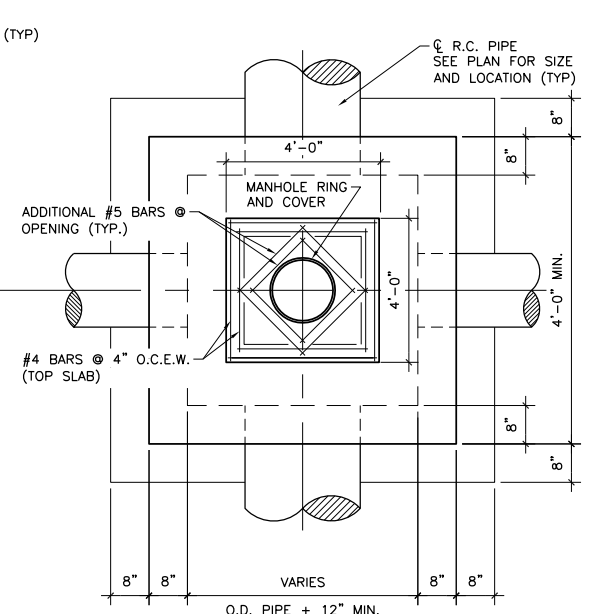
TYPE "A" MANHOLE
NOT TO SCALE

PLAN TYPE 'B' MANHOLE
NOT TO SCALE



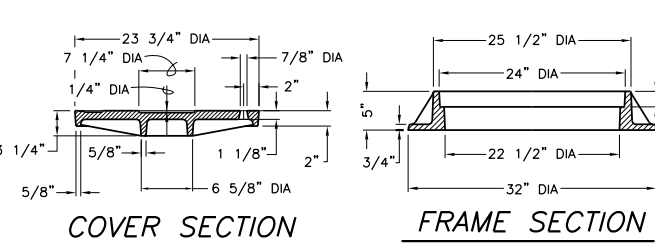
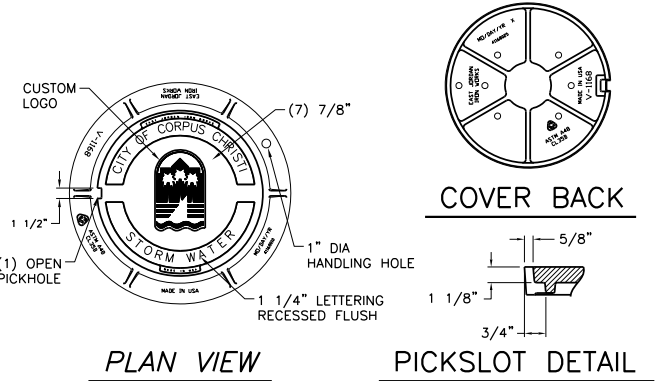
NOTE:
 FOR R.C. PIPE SIZES, DIRECTION, AND FLOWLINES, REFER TO STREET AND STORM WATER PLAN AND PROFILES

PLAN TYPE 'C' MANHOLE
NOT TO SCALE

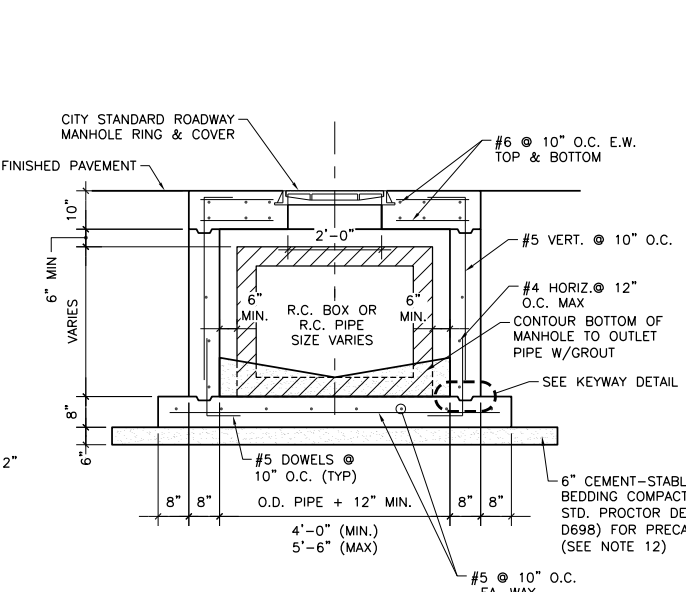


NOTE:
 FOR R.C. PIPE SIZES, DIRECTION, AND FLOWLINES, REFER TO STREET AND STORM WATER PLAN AND PROFILES

PLAN TYPE 'D' MANHOLE
NOT TO SCALE

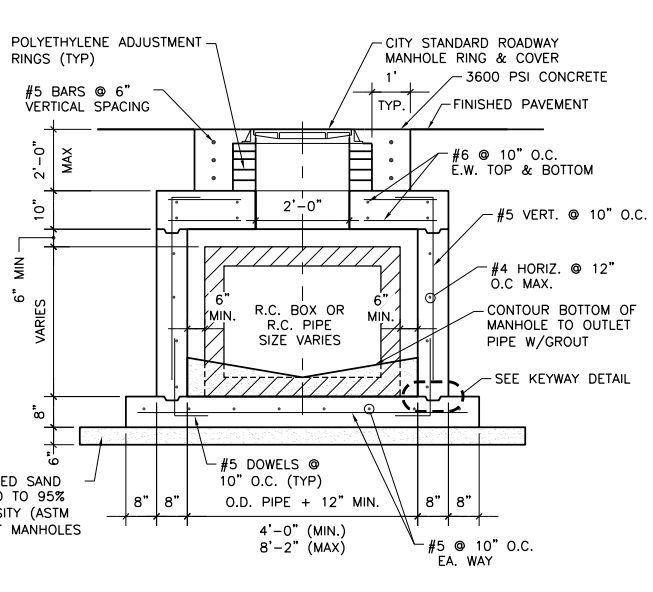


CITY STANDARD ROADWAY MANHOLE RING & COVER CASTING DETAIL
NOT TO SCALE



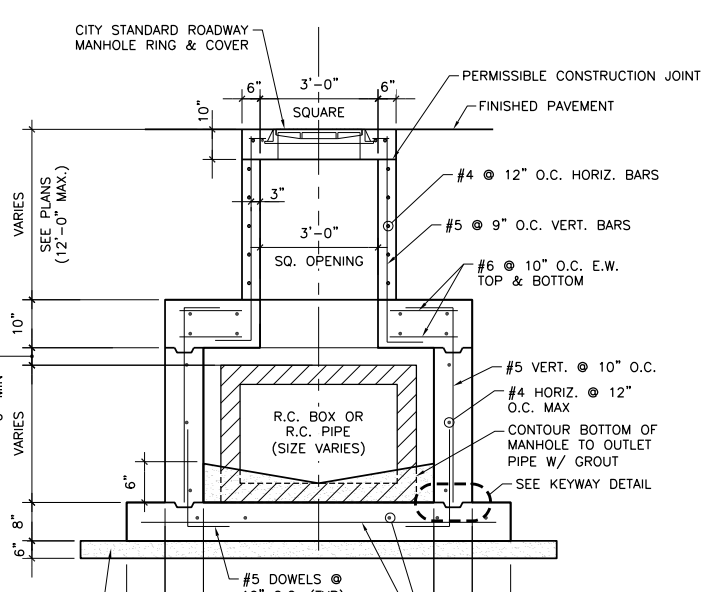
NOTE:
 LATERAL PIPES NOT SHOWN FOR CLARITY

SECTION TYPE 'B' MANHOLE
NOT TO SCALE



NOTE:
 LATERAL PIPES NOT SHOWN FOR CLARITY

SECTION TYPE 'C' MANHOLE
NOT TO SCALE



NOTE:
 LATERAL PIPES NOT SHOWN FOR CLARITY

SECTION TYPE 'D' MANHOLE
NOT TO SCALE

- 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 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 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.

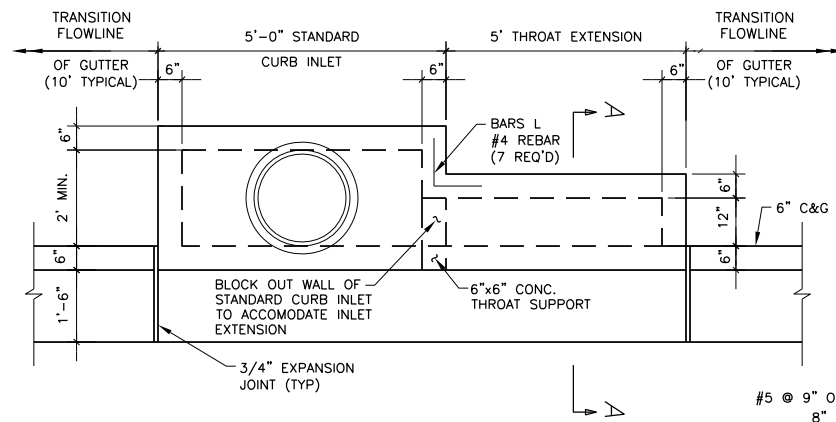
- OTHER CASTING PATTERNS FOR RING & COVERS MAY BE SUBMITTED FOR APPROVAL PROVIDED THE PLAN PATTERN OF COVER IS THE SAME AS SHOWN ON THIS SHEET AND PROVIDED OTHER CASTINGS SHALL BE COMPLETELY INTERCHANGEABLE, I.E., THE COVERS OF THIS SHEET SHALL FIT PROPERLY, THE RINGS OF OTHER CASTING DETAILS AND THE 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 HS 20 TRAFFIC LOADING.

- GENERAL NOTES FOR CONCRETE DRAINAGE STRUCTURES:**
- ALL CONCRETE SHALL BE CLASS "C" (3600 PSI) EXCEPT CITY STANDARD CURB INLETS AND CONCRETE COLLARS MAY BE CLASS "A".
 - ALL REINFORCING STEEL SHALL BE GRADE 60.
 - DIMENSIONS RELATING TO REINFORCING STEEL ARE TO CENTERS OF BARS.
 - VERTICAL STEEL MAY BE SPLICED (15" MIN. LAP) IN THE LOWER ONE-HALF OF ALL INLET WALLS.
 - IN AREAS OF CONFLICT BETWEEN REINFORCING STEEL, PIPES AND MANHOLE FRAME, THE REINFORCEMENT SHALL BE BENT OR ADJUSTED TO CLEAR AS DIRECTED BY THE ENGINEER.
 - CHAMFER ALL EXPOSED EDGES 3/4".
 - PROVIDE CITY STANDARD SIDEWALK MANHOLE RING AND COVER FOR CITY STANDARD CURB INLET. PROVIDE CITY STANDARD ROADWAY STORM WATER MANHOLE RING AND COVER FOR SPECIAL CURB INLET.

- THE CONTRACTOR MAY PROPOSE ALTERNATE PROCEDURES FOR THE CONSTRUCTION OF INLETS AND MANHOLES, INCLUDING PRECAST UNITS. PLANS FOR SUCH PROPOSED ALTERNATES SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL BEFORE CONSTRUCTION. PRECAST MANHOLE WITHIN THE ROADWAY SHALL BE DESIGNED TO SUPPORT HS 20 TRAFFIC LOADING AND SEALED BY A LICENSED ENGINEER.
- ALL INLET WALLS SHALL BE FORMED EXCEPT WHERE THE NATURE OF THE SURROUNDING MATERIAL IS SUCH THAT IT CAN BE TRIMMED TO A SMOOTH VERTICAL FACE. WHEN INLET WALLS ARE PLACED TO NEAT EXCAVATION LINES THE WALL THICKNESS SHALL NOT EXCEED 10 INCHES. PAYMENT FOR INLET AT THE CONTRACT PRICE SHALL INCLUDE THE TRANSITION CURB.
- INVERT OF INLET SHALL BE SLOPED 1:20 WITH GROUT.

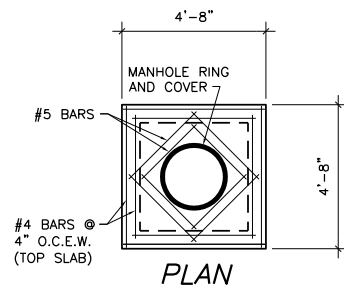
- NO SPLICING OF REINFORCING STEEL SHALL BE PERMITTED EXCEPT WHERE OTHERWISE NOTED ON THE PLANS OR PERMITTED IN WRITING BY THE ENGINEER.
- IN DEEP EXCAVATIONS (> 20') OR BELOW WATER TABLE, USE CRUSHED STONE OR CRUSHED GRAVEL MEETING GRADATION OF CONCRETE COARSE AGGREGATE; TxDOT ITEM 421; GRADE 2, 3, OR 4.

REVISION NO.	DATE	BY	DESCRIPTION

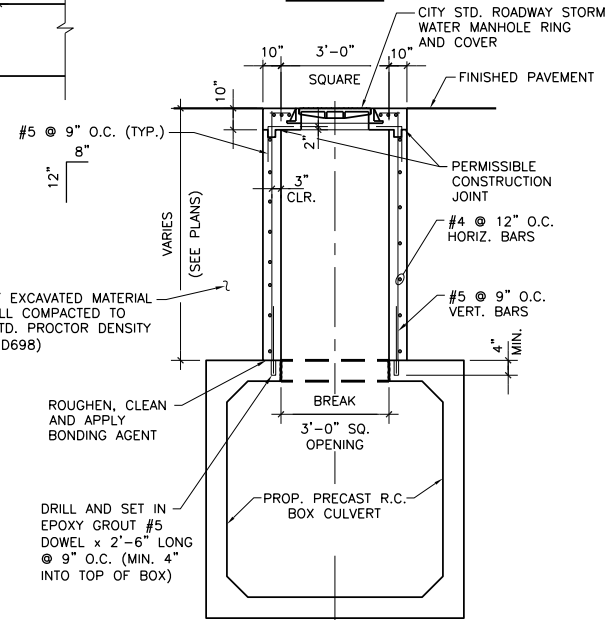


CURB INLET THROAT EXTENSION PLAN

NOT TO SCALE



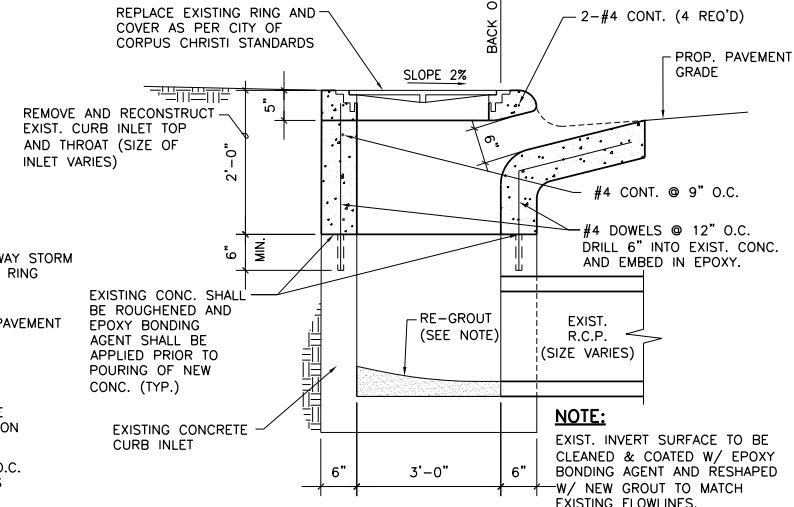
PLAN



SECTION

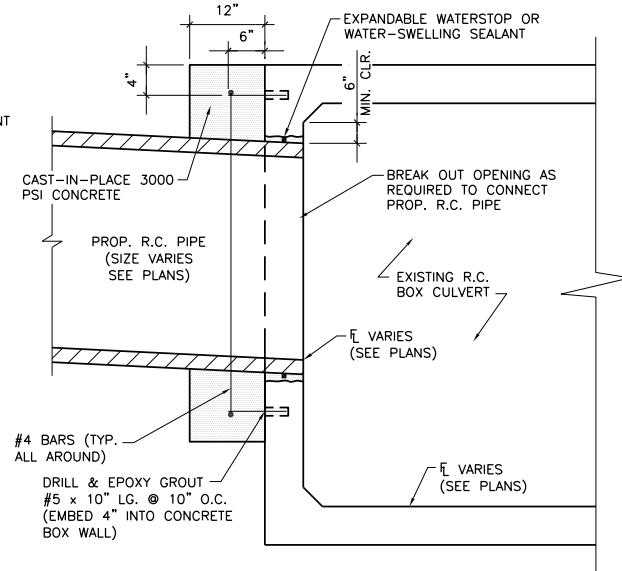
MANHOLE RISER DETAIL

NOT TO SCALE



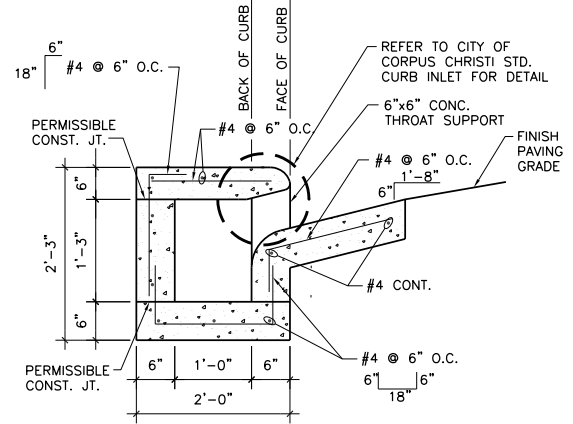
REMOVE AND REPLACE TOP OF EXISTING CURB INLET DETAIL

NOT TO SCALE



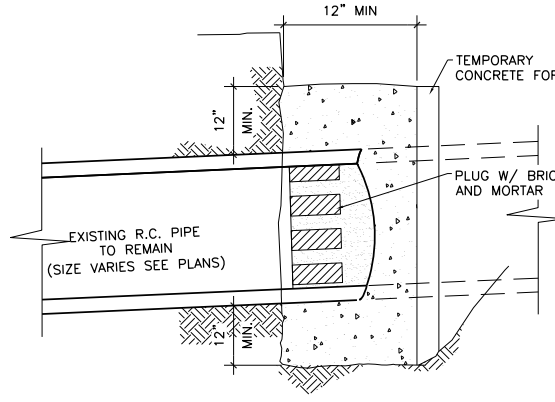
PROP. PIPE TO EXISTING R.C. BOX CONNECTION DETAIL

NOT TO SCALE



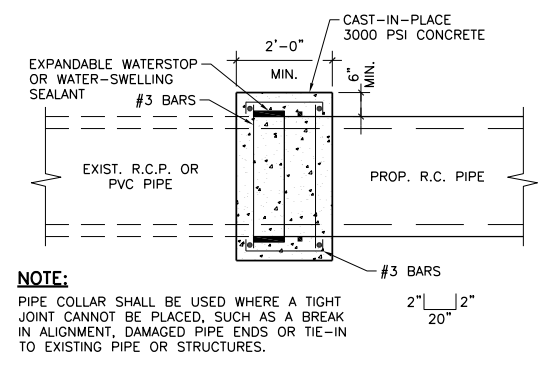
SECTION A-A

NOT TO SCALE



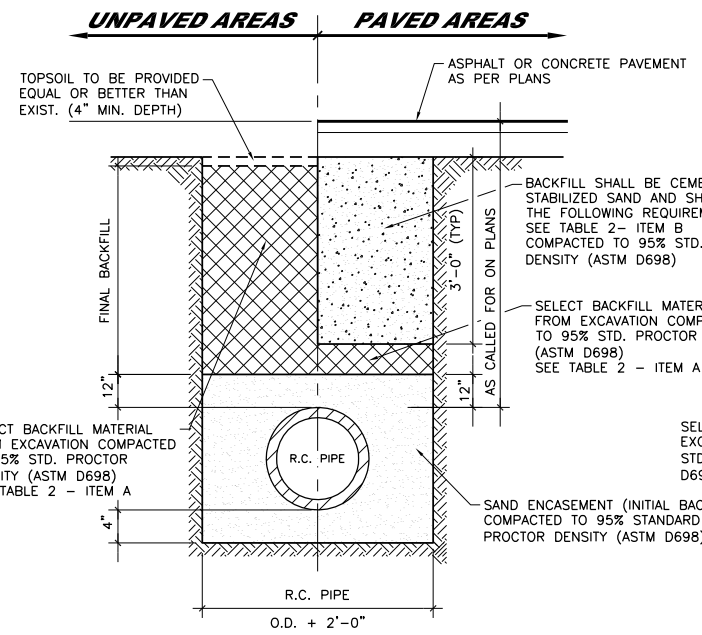
EXISTING R.C. PIPE PLUG

NOT TO SCALE



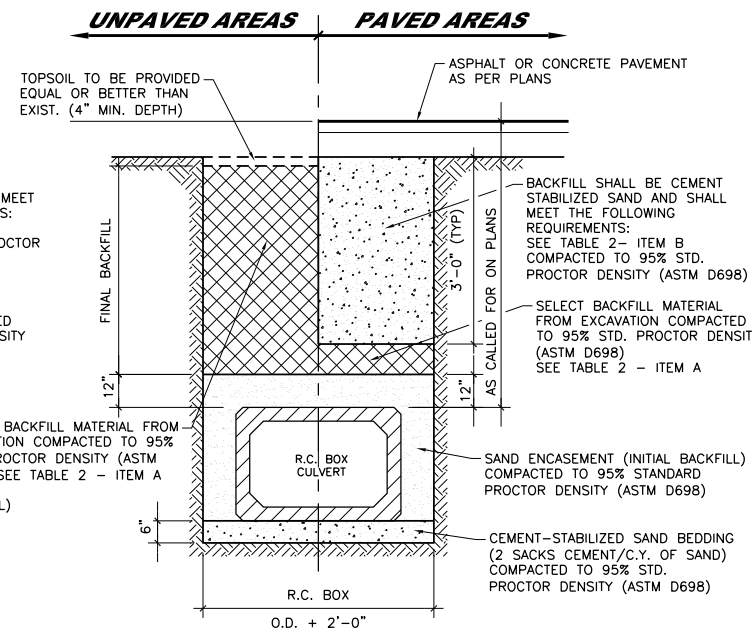
CONCRETE COLLAR DETAIL

NOT TO SCALE



TRENCH BACKFILL FOR STORM WATER PIPES

NOT TO SCALE



TRENCH BACKFILL FOR STORM WATER R.C. BOX CULVERTS

NOT TO SCALE

NOTE: (CONCRETE PAVEMENT ONLY)
CONTRACTOR HAS OPTION TO USE CEMENT STABILIZED SAND OR BACKFILL WITH SELECT BACKFILL MATERIAL.

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. SEWER LINES:</p> <p>1. EXCAVATIONS <20FT. DEEP AND ABOVE WATER TABLE, USE MATERIAL MEETING THE FOLLOWING CRITERIA.</p> <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> <p>PASSING 1/2" SIEVE - 100%</p> <p>PASSING #4 SIEVE - 30% MINIMUM</p> <p>PLASTICITY INDEX (PI) - NP TO 10 MAX.</p> <p>2. IN DEEP EXCAVATIONS (>20') OR BELOW WATER TABLE, USE CRUSHED STONE OR CRUSHED GRAVEL MEETING GRADATION OF:</p> <p>A. CONCRETE COARSE AGGREGATE; TxDOT ITEM 421; GRADE 2, 3, OR 4.</p> <p>FOR ALL UTILITIES:</p> <p>1. FOR PIPE DIAMETER EQUAL TO OR SMALLER THAN 16", USE 4" MINIMUM BEDDING UNDER PIPE.</p> <p>2. FOR PIPE DIAMETER GREATER THAN 16", USE 6" MINIMUM BEDDING UNDER PIPE.</p>	SP	GP	SW	GW	SP-SM	GP-GM	SW-SM	GW-GM	<p>UNPAVED AREAS</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>B. TOPSOIL TO BE PROVIDED EQUAL OR BETTER THAN EXISTING; AND MATCH EXISTING TOPSOIL DEPTH. (4" MIN.) COMPACT TO FIX CONFLICT TO EXISTING ADJACENT TOPSOIL. (CONSTRUCTION TO BE PERFORMED BY "DOUBLE DITCH" METHOD TOP SOIL SALVAGED TO BE PLACED ON TOP)</p> <p>PAVED AREAS</p> <p>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:</p> <p>LL < 35</p> <p>PI 8-20</p> <p>NO CLUMPS > 2" DIA.</p> <p>MOISTURE 0 TO +3%</p> <p>COMPACT 95% D698 STD PROCTOR</p> <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"> <tr> <td>% PASSING</td> <td></td> </tr> <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> </table> <p>2 SACKS CEMENT/C.Y. OF SAND.</p> <p>COMPACT TO 95% OF D698. 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																						
% PASSING																							
1/2"	100%																						
#4	55-100																						
#10	40-100																						
#40	25-100																						
#200	10-20																						
PI	NP-10																						

DESCRIPTION

BY

DATE

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DESCRIPTION


BY

DATE

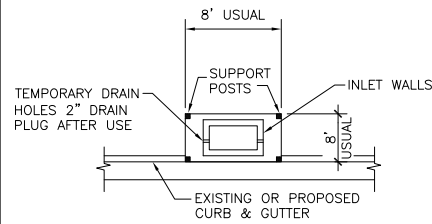
REVISION NO.

SHEET _____ of _____
RECORD DRAWING NO.

CITY PROJECT # _____


CITY OF CORPUS CHRISTI
TEXAS
 Department of Engineering Services

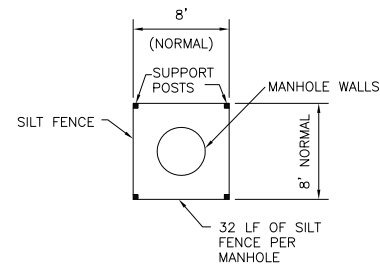
STORM WATER STANDARD DETAILS
 3 OF 3



NOTE:
TYPICAL SILT FENCE INSTALLATION AT CURB INLET PRIOR TO PLACEMENT OF CURB AND INLET TOP.

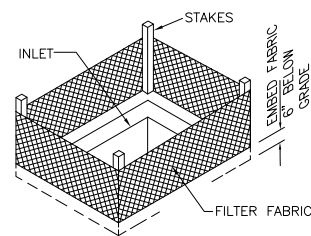
CURB INLET - PLAN

NOT TO SCALE



MANHOLE - PLAN

NOT TO SCALE

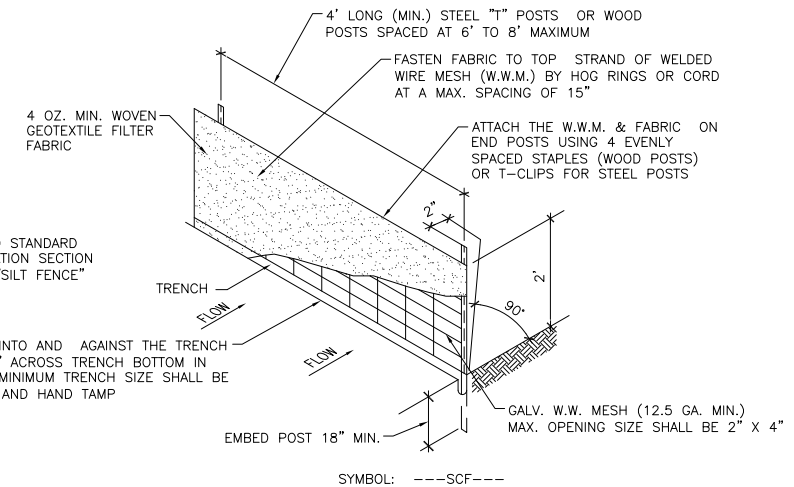


TEMPORARY FILTER FABRIC INLET PROTECTION DETAIL

NOT TO SCALE

NOTES:

1. FILTER FABRIC INLET PROTECTION SHALL BE USED DURING CONSTRUCTION TO CONTROL SEDIMENTATION.
2. PERIMETER SILT FENCING AROUND INLET LOCATIONS SHALL BE INSTALLED AFTER PIPE IS PLACED.
3. FABRIC MATERIAL SHALL BE A NET-REINFORCED FENCE, USING WOVEN GEOTEXTILE FABRIC.
4. FENCE SHOULD BE REMOVED UPON COMPLETION OF CONSTRUCTION.



NOTE:
REFER TO STANDARD SPECIFICATION SECTION 022420 "SILT FENCE"

PLACE 6" OF FABRIC INTO AND AGAINST THE TRENCH WALL AND APPROX. 2" ACROSS TRENCH BOTTOM IN UPSTREAM DIRECTION MINIMUM TRENCH SIZE SHALL BE 6" SQUARE. BACKFILL AND HAND TAMP

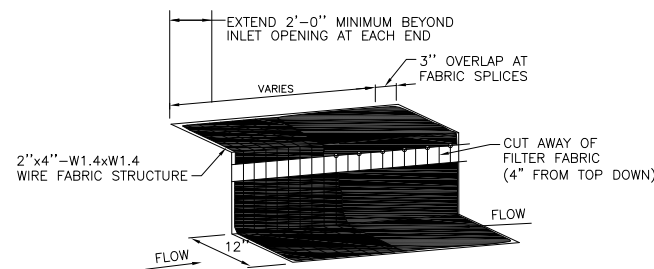
TEMPORARY SEDIMENT CONTROL FENCE DETAIL

NOT TO SCALE

SEDIMENT CONTROL FENCE USAGE GUIDELINES:

SEDIMENT CONTROL FENCE MAY BE CONSTRUCTED NEAR THE DOWNSTREAM PERIMETER OF A DISTURBED AREA ALONG A CONTOUR TO INTERCEPT SEDIMENT FROM OVERLAND RUNOFF. A 2 YEAR STORM FREQUENCY MAY BE USED TO CALCULATE THE FLOW RATE TO BE FILTERED.
SEDIMENT CONTROL FENCE SHOULD BE SIZED TO FILTER A MAX. FLOW THROUGH RATE OF 100 GPM/FT. SEDIMENT CONTROL FENCE IS NOT RECOMMENDED TO CONTROL EROSION FROM A DRAINAGE LARGER THEN 2 ACRES.

* THE GUIDELINES SHOWN HERE ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.

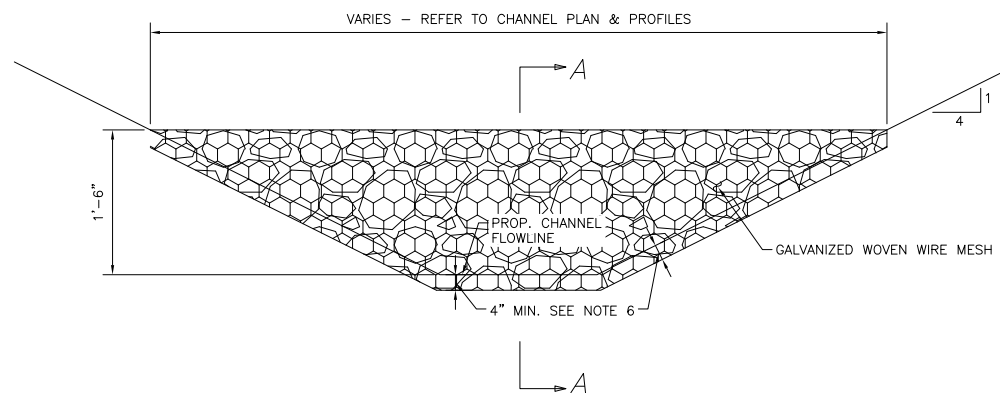


CURB INLET PROTECTION DETAIL

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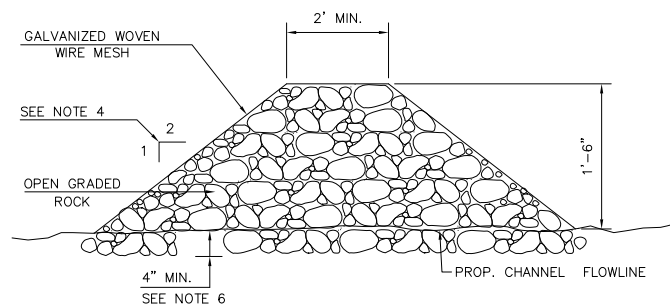
NOTES:

TYPICAL EROSION CONTROL INSTALLATION AT CURB INLET AFTER PLACEMENT OF CURB AND INLET TOP.



ROCK FILTER DAM AT EARTHEN BOTTOM CHANNEL

NOT TO SCALE

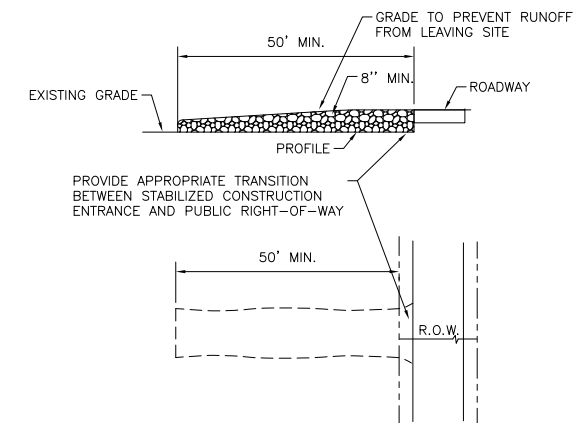


SECTION A-A

NOT TO SCALE

ROCK FILTER DAM NOTES:

1. IF SHOWN ON THE PLANS OR DIRECTED BY THE ENGINEER, FILTER DAMS SHOULD BE PLACED NEAR THE TOE OF SLOPES WHERE EROSION IS ANTICIPATED, UPSTREAM AND/OR DOWNSTREAM AT DRAINAGE STRUCTURES, AND IN ROADWAY DITCHES AND CHANNELS TO COLLECT SEDIMENT.
2. MATERIALS (AGGREGATE, WIRE MESH, SANDBAGS, ETC.) SHALL BE AS INDICATED BY THE SPECIFICATIONS FOR "ROCK FILTER DAMS FOR EROSION AND SEDIMENT CONTROL."
3. THE ROCK FILTER DAM DIMENSIONS SHALL BE AS INDICATED ON THE PLANS.
4. SIDE SLOPES SHOULD BE 2:1 OR FLATTER.
5. ROCK FILTER DAM SHALL BE A MINIMUM OF TWO FEET IN THICKNESS AT TOP OF DAM.
6. FILTER DAMS SHOULD BE EMBEDDED A MINIMUM OF 4" INTO EXISTING GROUND.
7. THE SEDIMENT TRAP FOR PONDING OF SEDIMENT LADEN RUNOFF SHALL BE OF THE DIMENSIONS SHOWN ON THE PLANS.
8. ROCK FILTER DAM SHALL BE SECURED WITH 20 GAUGE GALVANIZED WOVEN WIRE MESH WITH 1" DIAMETER HEXAGONAL OPENINGS. THE AGGREGATE SHALL BE PLACED ON THE MESH TO THE HEIGHT & SLOPE SPECIFIED. THE MESH SHALL BE FOLDED AT THE UPSTREAM SIDE OVER THE AGGREGATE AND TIGHTLY SECURED TO ITSELF ON THE DOWNSTREAM SIDE USING WIRE TIES OR HOG RINGS. IN STREAM USE THE MESH SHOULD BE SECURED OR STAKED TO THE STREAM BED PRIOR TO AGGREGATE PLACEMENT.
9. FLOW OUTLET SHOULD BE ONTO A STABILIZED AREA (VEGETATION, ROCK, ETC.)
10. THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.



PLAN STABILIZED CONSTRUCTION ENTRANCE

NOT TO SCALE

CONSTRUCTION ENTRANCE NOTES:

1. STONE SIZE: 3-5" OPEN GRADED ROCK.
2. LENGTH: AS EFFECTIVE BUT NOT LESS THAN 50'.
3. THICKNESS: NOT LESS THAN 8".
4. WIDTH: NOT LESS THAN FULL WIDTH OF ALL POINTS OF INGRESS/EGRESS.
5. WASHING: WHEN NECESSARY, VEHICLE WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC ROADWAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE AND DRAINS INTO AN APPROVED TRAP OR SEDIMENT BASIN. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH OR WATERCOURSE USING APPROVED METHODS.
6. MAINTENANCE: THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC ROADWAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND, AS WELL AS REPAIR AND CLEAN OUT OF ANY MEASURE DEVICES USED TO TRAP SEDIMENT. ALL SEDIMENTS THAT IS SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC ROADWAY MUST BE REMOVED IMMEDIATELY.
7. DRAINAGE: ENTRANCE MUST BE PROPERLY GRADED OR INCORPORATE A DRAINAGE SWALE TO PREVENT RUNOFF FROM LEAVING THE CONSTRUCTION SITE.

DESCRIPTION

BY

DATE

REVISION NO.

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