



Closeout Audit of
Greenwood WWTP Electrical
Improvements to UV Systems
Project No. E10180

for

City of Corpus Christi



ISSUE DATE: December 7, 2023

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EXECUTIVE SUMMARY

Talson Solutions, LLC (Talson), an independent construction auditing and advisory firm, conducted a closeout audit of City of Corpus Christi's (the City) Greenwood WWTP Electrical Improvements to UV Systems Project No. E10180 (Project). CSA Construction, Inc. (CSA) is serving as the general contractor under fixed price agreement (Contract) for named components with an initial value of \$6.0 million. Engineering design services are being provided by Lockwood, Andrews & Newnam, Inc. (LAN). CSA and LAN are currently engaged by the City on other capital projects in design and construction phases.

The closeout audit primarily focused on contractual compliance by CSA but also included assessing the City's construction and engineering management of capital program areas including construction cost and change management, claims/disputes, project administration, progress status and cost reporting. Talson evaluated adherence to established financial controls and procedures, and assess the risk to successful project closeout. The audit also focused on the City, CSA, and LAN's activities from Project commencement through October 2023. The City, CSA and LAN provided critical additional information to Talson in late November 2023.

Talson observed compliance to financial controls and cost management procedures. However, the audit resulted in the identification of opportunities to enhance communications within the City and externally with CSA and LAN that would allow for final project closeout. Talson noted open administrative and operational activities which coupled with areas of contractual non-compliance have led to delays in fully commissioning the facility, uncertainty in the determination of partial utilization and Substantial Completion, closing out CSA's contract, and proper conveyance to the City's Wastewater Operations team. Supporting evidence includes:

- On November 28, the City officially provided a delayed response to CSA's request for Substantial Completion despite the facility being operational but not properly commissioned in September 2022
- Uncertainty exist between CSA and the City regarding open and/or unresolved items. CSA noted that all contract work is completed but the City contends there are open punch list items
- Contractual obligations for testing, start-up, commissioning and conveyance have not been formally followed and documented
- LAN's Project Manager was unaware that CSA had demobilized from the site in 2023 and did not participate in commissioning the facility in September 2022
- LAN did not participate or witness any component testing onsite or at the manufacturer
- Talson was advised of items that have not been officially documented and/or been resolved which may impact full contract closeout and adversely impact plant operations
- The City rejected CSA's current invoice due to unresolved liquidated damages assessment

The audit included detailed review of various Project documents and interviews with representatives of the City, CSA and LAN. A closeout audit briefing was facilitated to further clarify contents of this audit report. The City Auditor's Office and Engineering Services Department were accessible and provided beneficial support to the audit.

PROJECT BACKGROUND

The Project provides for a new Ultraviolet (UV) disinfection system at the Greenwood Wastewater Treatment Plant (WWTP) to meet or exceed the existing effluent limits for Enterococci bacteria which is set at 35 CFU/100 ml. The Project includes a new tertiary filter basin upstream of the proposed UV system. To address stipulations noted in the 2021 Consent Decree with the Southern District of Texas including alleviating historic flooding issues at the plant, the new equipment was set at an elevation above the proposed 2015 Federal Emergency Management Administration (FEMA) 100-year base flood elevation to ensure continued disinfection capability required by the Texas Commission on Environmental Quality (TCEQ).

CSA's Payment Application No. 18 for the period February 1, 2023 to April 20, 2023, dated June 2023, included an updated Schedule of Value (SOV) of \$6,026,470, inclusive of Change Order No. 1 for \$9,042 and Change Order No. 2 for \$27,428. Ninety-eight percent (98%) of the SOV has been invoiced through Payment Application No. 18.

As of October 20, 2023, CSA had not formally commenced subcontractor closeout or submitted a request for retainage due to not obtaining a Certificate of Substantial Completion from the City. The original Substantial Completion date was May 2, 2022 or 540 calendar days from receipt of the Notice to Proceed issued, November 9, 2020, with Final Completion scheduled for 30 calendar days from Substantial Completion. Change Order No. 2 dated March 3, 2023 added 119 calendar days amending the Substantial Completion date to August 31, 2022¹.

On June 8, 2023, CSA submitted correspondence to the City memorializing that the Effluent Filter Facility was completed and placed in-service on September 26, 2022 and that the UV Disinfection Facility was completed and placed in service as of September 7, 2022. The City had 120 days (October 8, 2023) to respond to CSA with either acceptance or non-acceptance. On November 28, 2023, the City officially responded to CSA indicating partial utilization and warranty start date for the Filter and UV Systems will be September 28, 2022.

AUDIT SCOPE

Talson conducted the assessment in alignment with the International Standards for the Professional Practice of Internal Auditing issued by the Institute of Internal Auditors. Those standards require planning and performing the audit to obtain sufficient and appropriate evidence to provide reasonable basis for observations and conclusions within a detailed audit report based on the audit objectives.

Talson utilized a comprehensive risk-based approach to assess compliance to contract provisions and identify any risks to successful Project completion, specifically within budget and on-time. Talson assessed Project Management's (e.g., City, general contractor, designers and subcontractors) alignment with industry best practices throughout the engagement, facilitated

¹ Additional calendar days afforded to the contract were for City related request including fabrication, delivery and installation of an added 96-inch diameter concrete manhole, fabrication, delivery and installation of removable handrails and other facility upgrades.

knowledge sharing discussions, and collaborated with the Project teams to ensure transparency of the audit work but also maintained independence.

Specific audit scope for the construction closeout phases included focus on verification and compliance requirements of closeout documentation, pricing of change orders, invoices, and claims. Assessment of status of CSA and related subcontractor's closeout activities, inclusive of cost reconciliation and contract deliverables.

WORK PERFORMED

Audit work consisted of document review and Project team interviews and discussions over two primary periods; (1) September 2023 to early October 2023 including the site visit and (2) mid-October to end of November 2023. Specific audit activities included reviewing the following:

1. Reviewed CSA's closeout process of subcontractor to ensure reconciliation of final costs, allowances, deliverables, warranties, training, etc.
2. Verified procedure to determine final contract value including final subcontractor values, reconciliation of allowances, and determination of any contract savings and final CSA fees prior to determining anticipated final Change Order No. 3 for contract closeout and retainage release.
3. Detailed review of CSA's Payment Application No. 18, inclusive of supporting documentation for subcontractor work, lien waivers, insurance premium charges, fee calculations, and status of other schedule of value costs.
4. Reviewed change orders for Contract within CSA's invoicing, confirmed proper approval, reasonableness and appropriateness of change to ensure work is not duplicated, and reviewed subcontractor documentation included for change support.
5. Reviewed other project documentation, RFI, submittals, meeting minutes, schedule, etc., to determine any potential risk that may warrant further review.
6. Assessed project administration by CSA, the City and LAN including numerous emails correspondence related to Substantial Completion.

A complete list of documents reviewed and interviews conducted is listed in Appendix A.

FINDINGS, OBSERVATIONS AND RECOMMENDATIONS

As a result of noted contractual and procedural areas of non-compliance, the audit yielded two (2) Findings and eight (8) Observations. Associated recommendations to the Findings are also provided for consideration by the City. The following classifications, **Finding** and **Observation** are provided to ensure alignment within our approach and methodology:

- **Finding** is an issue where a party (the City or other) is non-compliant with a contractual provision, a stated policy, or procedure. A finding may also be identified in situations of impact to the schedule or budget, or an immediate control risk has been identified. Corrective action must be taken, and a management response provided.
- **Observation** does not mean there is an issue of non-compliance; however, the auditor has determined that the issue poses a potential risk of becoming a finding in the future and **may** require a management response. An observation might also be a process enhancement that can be incorporated in a project going-forward or on future capital projects.

The following **Findings** have been discussed with the City:

Finding No. 1 – Commissioning Systems

Plans for the commissioning of process system per contract specifications had not been fully complied with and/or addressed through a formal submittal process. Evidence include:

- a) The operational testing and submission of certified reports for testing, start-up and calibration of the facility, to be prepared by CSA as the system supplier, has not been formally submitted and/or approved by the Design Engineer or Engineering Services as required in *Specification 40 80 00 Commissioning of Process Systems - 1.1 Scope*. *Specification 40 80 00 Commissioning of Process Systems - 1.2 Submittals* requires that a Test Plan be submitted for approval describing what tests should be conducted, inclusive of list of test equipment, procedures, check lists, and reporting formats. The Test Plan is to be submitted sixty (60) days before commissioning activities are scheduled to start. CSA's Submittal Log does not show a submission for this requirement nor was the City aware of any submission for commissioning by CSA.
- b) *Specification 40 80 00 Commissioning of Process Systems - 3.2 Test Reports* requires "check-off lists" to be submitted to the City at least sixty (60) days before commissioning starts, when requested by the City and no more frequently than once a week. CSA's Submittal Log does not show any "check-off list" submittals for this requirement.

Recommendation No. 1

CSA should submit operational testing, inspection and commissioning documentation for formal approval by LAN and receipt by the City/Operations prior to CSA requesting formal notice of Substantial Completion.

Finding No. 2 – Partial Utilization or Substantial Completion

The City is non-compliant with conditions of “partial utilization” or Substantial Completion requirements of the contract. Evidence include:

- a) Although the facility has been placed in service, the contractually required Certificate of Substantial Completion for partially accepted work has not been issued to CSA per *General Conditions Article 17.13 Partial Utilization*. This Article directs Contractor and Owner to follow the process detailed in *General Conditions Article 17.12 Substantial Completion* when the City takes beneficial use of installed equipment or systems. CSA submitted a letter dated June 8, 2023 memorializing the dates when the Filtration and UV Disinfection Systems were put into service and operated by the City and a subsequent email dated August 15, 2023 requesting Substantial Completion in October 2022. The City is obligated to responded on or before October 8, 2023 (120 days) with either acceptance or non-acceptance.
- b) The City has taken partial utilization of the Effluent Filter Facility which was placed in-service on September 26, 2022 and UV Disinfection Facility placed in service on September 7, 2022.
- c) On November 28, 2023, the City officially responded to CSA indicating partial utilization and warranty start date of September 28, 2022 for the Filter and UV systems.

Recommendation No. 2

The City should determine a schedule and related work scope to accurately forecast a realistic date to achieve Substantial Completion and subsequent final project closeout.

Management Executive Summary

In general terms, this project has been successfully delivered. In the words of Daniel Deng, CCW Assistant Director for Wastewater Treatment, "In my opinion, the operations is great".

There are some lingering issues with SCADA programming and testing that have delayed CSA's obtaining substantial completion on the project. These issues are being addressed by CSA and they have a plan for completing all outstanding work items in the near future.

The following bullets describe Engineering's general impressions about the overall project delivery and the Talson audit:

- Permit compliance has been exceptional and greatly exceeds the performance of the prior process unit.
- The project is providing nearly all of the intended benefits.
- Change orders have been minimal and are well within acceptable levels,
- After liquidated damages are assessed, the CSA contract will likely be completed below awarded contract value.
- The audit has failed to identify any significant issues that present risk to the City.
- With the exception of SCADA programming and testing, CSA's performance has been very good.
- CSA delayed the programming and testing of the required SCADA changes and will likely be assessed liquidated damages for that delayed execution
- LAN's performance has been acceptable as evidenced by project performance and low change orders.
- LAN is addressing some minor issues with design document conflicts and errors.
- LAN has offered the City a credit for a design deficiency.
- Engineering is confident that an acceptable arrangement will be reached with LAN to address the design issues.
- Engineering provided many thousands of pages of documents to Talson to support their audit. The audit report focuses only on negative findings and observations. Engineering believes that the reader should assume that any area that the report is silent on was found to be reasonably consistent with industry best management practices.

Findings Nos. 1 and 2 Management Responses:

Finding No. 1a – Management accepts. The testing plan has been received and is under review. There has been confusion due to disagreement between specification sections. The major systems come with local control panels that are provided by the manufacturer. Section 40 90 00 VENDOR CONTROL PANELS has a Startup and Field Testing section. Those tests were attended by a manufacturer representative and successfully completed prior to placing the system in operation. The overall system commissioning has not yet been completed. Specification 40 80 00 Commissioning of Process Systems is a generic specification that was not specifically edited to fit this project. Management is developing a plan to satisfy the intent of that specification section.

Finding No. 1b – Management partially accepts. As mentioned above, Specification 40 80 00 Commissioning of Process Systems is a generic specification that was not tailored for this specific project. Section 40 90 00 VENDOR CONTROL PANELS has a Startup and Field Testing section and the approved submittals and O&M manuals have start up and commissioning checklists.

Finding No. 2 – Management accepts. There should have been a formal response to CSA’s request. The City will be providing a staggered Substantial Completion due to the partial utilization that will be back dated for purposes of liquidated damages and warranty.

Management has agreed to address all accepted Findings on/or before March 31, 2024 and is diligently engaged with all project stakeholders to bring this contract to a successful conclusion.

The following *Observations* have been discussed with the City:

Observation No. 1

There is an opportunity to enhance communication between the City (various departments), LAN and CSA to resolve issues related to the closeout of the Project. Open issues may include, but are not limited to:

- a) New SCADA tie-in and integration with the existing SCADA software and programming
- b) Outfall pipe overflowing and drainage issues
- c) Flow meter in UV Disinfection System not working
- d) Status of punch list items
- e) Inconsistencies of design obligations for requirement and placement of measuring equipment (e.g., Flow Meter, etc.)
- f) Finalization of Commissioning Plan and associated activities
- g) Disposition of Substantial Completion date

Observation No. 2

Talson noted a lack of communication with LAN that occurred during the construction and start-up phase which may have led to current discrepancies and required clarity for various design questions. Evidence is as follows:

- a) LAN was unaware that CSA had demobilized from the project in the Spring of 2023
- b) LAN did not know that the City had placed the Effluent Filter and UV Disinfection System into service in September 2022
- c) LAN did not participate in commissioning, start-up, or acceptance testing of new systems
- d) In November 2023, LAN was asked to conduct or participate in Project punch list walks but no formal punch list have been completed.

Observation No. 3

Talson noted conflicting contract language (*which has been addressed in subsequent contracts*) regarding who receives notice of the request for the Certificate of Substantial Completion.

- *Article 17.12 Substantial Completion* directs CSA to notify the Owner Authorized Representative (OAR) when Work is substantially complete and request Certificate of Substantial Completion.
- *Article 29.02A Substantial Completion* directs the Contractor (CSA) to notify the Designer (LAN) that the Work is substantially complete including a list of items remaining to be completed or corrected before Project is considered complete. The Designer is designated as issuer of Notice of Substantial Completion.²

Observation No. 4

Talson noted numerous inconsistencies and discrepancies regarding the status of submitted contractually obligated documents and closeout activities, including items referenced in Observation No. 1 (e.g., Commissioning Plan, acceptance of punch list, etc.).

Observation No. 5

LAN has several open tasks remaining as part of the Project closeout activities.

- a) Submit Final Completion Letter to TCEQ (*Exhibit A - Task No. 6*)
- b) Conduct Project walk documenting punch list items for correction (*required in CSA contract – General Conditions*)
- c) Produce and transmit Record Drawings incorporating the redlines/as-built drawings submitted by the CSA (*required in CSA contract – General Conditions*)

² LAN's Construction Administration responsibilities does not include any reference to reviewing and/or issuing a Certificate of Substantial Completion.

Observation No. 6

CSA would like to proceed with final contract close-out but are awaiting the Certificate of Substantial Completion in order to proceed with Final Inspection and submit Final Payment Estimate to the City.

Observation No. 7

Talson was unable to obtain any documentation to determine if an evaluation of the use of the formal risk management process would be required for the Project per Engineering Services.

Observation No. 8

Final Project closeout per Project Closeout Procedure is delayed and cannot commence until Substantial Completion has been achieved and a project walk-through with punch list is conducted. Additionally, Contract Funds Administration (CFA) cannot begin the final closeout budget reconciliation until CSA has submitted the Final Payment Estimate No. 17.

The documents required for closing a project are as follows:

- | | |
|--------------------------|---|
| a. Final Estimate No. 17 | f. Minority Business Enterprise Participation |
| b. Acceptance Memo | g. Closeout Checklist |
| c. Project Summary | h. Record Drawings/As-Builts |
| d. Affidavit | i. Punch List |
| e. Waiver of Lien | |

Observation Nos. 1, 2, 3, 4, 5, 6, 7 & 8 Management Responses:

Observation 1: Accept. Communication can always be improved. An additional challenge that this project faced was that much of the construction took place during the COVID pandemic. Engineering is going to conduct training on proper communication and issue escalation.

Observation 2: Partially accept. LAN has been involved in the project and have been in discussions with the City regarding all design concerns. Staff turnover at LAN has contributed to some confusion within the company over what has occurred on this project. Design engineers are engaged as necessary during construction on a T&M basis to respond to RFI's, approve submittals and make periodic site visits. LAN should have been invited to attend testing.

***Auditor Response:** Per interviews and follow-up email correspondence with LAN, Talson respectfully disagrees. Additionally, LAN's contract states "The Consultant's fee will be on a lump sum or time and materials (T &M) basis as detailed in Exhibit A and will be full and total compensation for all services and for all expenses incurred in performing these services." Talson was not provided any evidence that any work was done on a T&M basis.*

***Engineering Response to Auditor:** Current practice is to pay AE's for construction phase services using a T&M allowance. Talson is correct that this legacy 2015 AE contract compensated construction phase services as a lump sum based on a proposed level of effort that included two site visits per month. It is unclear if that was performed. Engineering should have ensured that the LAN site visits occurred, included LAN on all correspondence and invited LAN to significant project events. Engineering will ensure that AE's are included on correspondence and invitations for significant project events.*

Observation 3: Accept that the observation is correct. This does not, however, present a problem. The General Condition language has been updated since this contract. Project Substantial Completion has not been achieved, once it is achieved the Engineer of Record and City can issue a joint Substantial Completion letter.

Observation 4: Do not accept. Project Substantial Completion has not yet been granted. See management response to Finding No. 1. There are inconsistencies between various specification sections. Engineering is offering to backdate overall substantial completion provided CSA addresses all outstanding issues in a timely fashion.

***Auditor Response:** The City has provided conflicting correspondence in October and November 2023 regarding the dates of partial utilization and the effective Substantial Completion date.*

Observation Nos. 1, 2, 3, 4, 5, 6, 7 & 8 Management Responses (continued):

Observation 5: Accept. We expect LAN to complete any open tasks as part of the closeout process.

Observation 6: Accept that CSA wishes to closeout the contract. As per Talson's findings, there are open CSA action items preventing final acceptance.

Auditor Response: Excluding an agreement on liquidated damages, Talson was not provided a list of agreed CSA action items preventing contract closeout. Through interviews and documentation review, Talson noted inconsistencies in the City's potential determination to pursue liquidated damages.

Observation 7: Accept. Engineering Services will perform and document a Risk Assessment.

Observation 8: Project completion has not been achieved, as such the warranty and closeout process has not started. For warranty and liquidated damage purposes, the OAR is contemplating a staggered Substantial Completion and warranty period for various elements of the work.

Auditor Response: For the two completed systems (Filter & UV), the warranty period has commenced since the systems were operational since September 2022.

Management has agreed to address all accepted Observations on/or before March 31, 2024

Closeout Audit of Greenwood WWTP Electrical Improvements to UV Systems

Appendix A: Documents Reviewed & Interviews Conducted

Documents Reviewed: City of Corpus Christi

1. On Site Monthly Meeting Minutes, April 15, 2021 to May 1, 2023
2. E10180 Change Order Tracker, undated
3. Executed Change Order No. 1 to CSA dated June 8, 2021
4. Executed Change Order No. 2 to CSA dated March 31, 2023
5. City of Corpus Christi Construction Inspection Daily Activity Report, July 17 – 23, 2023
6. Construction Project Management To Do List, dated September 28, 2023
7. Construction Status Report, dated September 28, 2023
8. Lockwood, Andrews & Newnam, Inc. Executed Agreement dated July 23, 2018
9. Notice to Proceed for CSA Construction, Inc. dated November 9, 2020
10. Executed Request for Bids Greenwood WWTP Electrical Improvement to UV System Project No. E10180
11. Certified Payroll for CSA and associated subcontractors:
 - a. Frank Jr. Reinforcement
 - b. Sitek-Omni
 - c. Scott Electric Company
12. Schedule, dated May 2, 2022
13. Bi-Weekly WW CIP Meeting Agenda & Status, dated October 22, 2022
14. Numerous emails correspondence to/from City, LAN, CSA
15. November 28, 2023 letter from Jeff H. Edmonds, P.E. to George Craig, CSA

Documents Reviewed: CSA

16. Emails from George Craig, various dates
17. CSA Greenwood Project Milestone Letter, dated June 8, 2023
18. Iso-Disc Filter System Operation & Maintenance Manual for Greenwood WWTP
19. CSA Construction, Inc Labor Burden Rate Detail
20. Greenwood SCADA IO Checklist 225389
21. UV Filter Drawings
22. E10180 UV Start Up
23. Submittal Response Nos. 1 – 44
24. Submittals No. 1, No. 4, No. 15 to No. 35, and No. 40
25. CSA Submittal Log
26. Scott Electric Executed Subcontractor Agreement
27. CSA Change Order Log, dated July 23, 2023
28. E10180 Estimate No. 18 Contractor
29. Job Cost Analysis, dated September 20, 2023
30. CSA RFI Log, dated June 1, 2023
31. CSA Schedule, dated August 2023
32. CSA Detail Subcontractor Status Report

Interviews Conducted:

- Brett Van Hazel, P.E. – Assistant Director of Construction Inspection
- Jeff Edmonds, P.E. – Director of Engineering Services
- Sandra Gomez – Project Manager
- Peter Collins – Director Information Technology Services
- David Lopez – SCADA Manager
- George Craig – CSA Construction, Inc.
- Scott Harris – Lockwood, Andrews & Newnam, Inc.

December 7, 2023

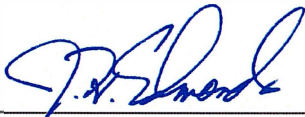
George H. Holland
City Auditor
Corpus Christi, Texas

Re: AU23-003 Greenwood WWTP Electrical

We have carefully reviewed the issues presented in the audit report referenced above, and our plans to correct the issues are described herewithin.

We are committed to correcting the issues in the audit report by implementing the action plans in a timely fashion.

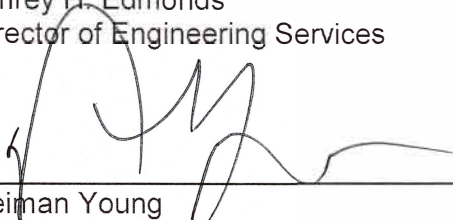
Sincerely,



Jeffrey H. Edmonds
Director of Engineering Services

12/7/23

Date



Neiman Young
Assistant City Manager

12/7/23

Date



Peter Zanoni
City Manager

12.7.23

Date