CONTRACT DOCUMENTS

CITY OF ALAMO WATER TREATMENT PLANT REHABILITATION AND PROTECTIVE COATING PHASE 1B

October 2025

STATE OF TEXAS
JAVIER GARCIA
83920
LICENSED
PROFESSIONAL ENGINEER

10/17/2025

CITY OF ALAMO
CLARICONE® CLARIFIER REHABILITATION AND PROTECTIVE COATING
PHASE 1B

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SECTION 00 11 16
REQUEST FOR COMPETITIVE SEALED PROPOSALS

PART 1 - GENERAL

1.1 NOTICE TO RESPONDENTS

Sealed proposals are requested by the City of Alamo for the rehabilitation and protective coating of Clarifier No. 1 and replacement of mechanical components for Clarifiers No. 1 and 2 at the Alamo Water Treatment Plant. **ELECTRONIC COPIES OF PLANS AND SPECIFICATIONS MAY BE DOWNLOADED ON THE CITY'S WEBSITE.**

A non-mandatory **pre-proposal conference** will be held at the City of Alamo Water Treatment Plant, 800 N 9th Pl, Alamo, Texas 78516 on **Monday, November 3, 2025, at 10:00 AM** for all prospective respondents to clarify any questions pertaining to the plans and specifications**.**

For questions regarding this solicitation, technical questions, or additional information, please contact The City of Alamo, Ms. Adela Perez, Purchasing Agent, in writing via email to aperez@alamotexas.org until **4:00 PM (CDT) on Monday, November 10, 2025**. Answers to the questions will be posted to the web site by **4:00 PM (CDT) on Friday, November 14, 2025,** as a separate document or included as part of an addendum. Be advised that firms responding to this RFCSP (Respondents) are prohibited from communicating with any other City of Alamo staff, the Consultant, or City officials regarding this RFCSP up until the contract is awarded as outlined in the Instructions to Respondents.

Sealed Proposals will be received, until **3:00 PM (CDT), on Thursday, November 20, 2025** at the City of Alamo City Hall, 420 N. Tower Rd., Alamo, TX 78516. Proposals shall be accompanied by a bid bond in an amount not less than five percent of the total proposal price. (Or, if providing the City of Alamo with a cashier's check or certified check in an amount not less than five percent of the total proposal price, the City of Alamo will request this within 24 hours from the Respondent who did not submit a bid bond). Proposals will then be publicly opened and read aloud.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

SECTION 00 21 13
INSTRUCTIONS TO RESPONDENTS

PART 1 - GENERAL

1.1 INSTRUCTIONS TO RESPONDENTS

The City of Alamo and/or its designated representative have determined that the Competitive Sealed Proposals method of procurement will provide the best value for this project. This procurement shall conform to Section 2269 of the Texas Government Code.

1.2 EVALUATION OF PROPOSAL

A. The City of Alamo will conduct a comprehensive, fair and impartial evaluation of all Competitive Sealed Proposals received in response to this request within 45 days of receipt of the proposals. The City of Alamo will appoint a selection committee to perform the evaluation. The City of Alamo will evaluate and rank each proposal in relation to the following selection criteria:

Team Qualifications and Experience	**20%**
Quality, Reputation, and Ability to Deliver Projects on Schedule and within Budget	**20%**
Project Approach, Schedule and Availability	**20%**
Price	**40%**
Total:	**100%**

B. During the evaluation and ranking of Respondents' proposals, the City of Alamo reserves the right to consider the following:
   1. Whether the Respondent can perform the contract within the specified time. In making this determination the City of Alamo may consider Respondent's existing commitments and whether in the City of Alamo sole discretion those commitments will adversely impact Respondent's ability to complete the work in the scheduled time.
   2. The quality and punctuality of performance on any current or previous contracts.
   3. The City of Alamo may contact references provided by the Respondent, as well as any other references to verify qualifications, experience and performance. In making this determination, the City of Alamo may consider work performed by the Respondent on any project, including but not limited to The City of Alamo projects, projects that the Respondent provides as references and any other projects that the City of Alamo has knowledge of.
   4. Respondent's previous and existing compliance with the applicable laws, ordinances, permits, and regulations.
   5. Respondent's financial resources and ability to perform the contract.
   6. If Respondent fails to provide a response to each of the Evaluation Criteria identified within this RFCSP, points may be deducted, or the proposal may be considered non-responsive and ineligible for consideration.

1.3 SUMMARY OF WORK

A. Mechanical improvements to Clarifiers Nos. 1 and 2. This work consists of repairing the Slurry Concentrator Assembly to ensure operation of this system.

B. Sandblast and apply protective coating on the interior and exterior of Clarifier No. 1 (West Unit).

1.4 REQUIRED EXPERIENCE

A. Respondents submitting a proposal for this RFCSP should clearly demonstrate experience in constructing proposed project improvements. This would include experience with treatment facilities and tank coating, having successfully provided these services for at least ten (10) continuous years.

1.5 DEFINITION

A. Personnel for the purpose of this RFCSP is defined as employees of the Prime Contractor, or any Subcontractor(s), affiliates, joint venture partners, or team members, and consultants engaged by any of those entities.

B. The personnel specified below are considered by the City of Alamo to be essential to the work being performed under this Contract and as such are defined as Key Personnel. Key Personnel include the Project Manager, Project Superintendent, Quality Control (QC) Manager, Project Scheduler, and Safety Coordinator. Prior to diverting any of the specified individuals to other projects, the contractor shall notify the Owner reasonably in advance and shall submit justification (including proposed substitutions) in sufficient detail to permit evaluation of the impact on the project. No diversion shall be made by the contractor without written consent of the Owner. Key Personnel must remain actively involved throughout the construction phase and be readily available. In accordance with the General Conditions, the proposed project Superintendent shall provide full-time on-site supervision to Work ongoing at the project site. The City of Alamo expects the contractor to assign and provide qualified Key Personnel that can effectively fulfill the responsibilities of their role for the duration of the project. Respondents must use their best judgement to ensure proposed Key Personnel remain effectively involved in the project for its entire duration.

C. Key Subcontractors for the purpose of this RFCSP are defined as subcontractors that are responsible for executing a significant portion of the work, and as such are deemed to be essential to the work being performed under this Contract. Key Subcontractor roles may include Electrical Mechanical, and Paint Coating.

1.6 RESPONSE FORMAT

A. Team Qualifications and Experience (20 Points)
1. Proposed Team Structure and Key Personnel Roles and Responsibilities.
2. Qualifications and Experience of Key Personnel Proposed for this Project.

B. Quality, Reputation, and Ability to Deliver Projects on Schedule and within Budget (20 Points)
1. Prime Contractor On-time Completion on Similar Projects in the Past Ten (10) Years
   a. List and describe three (3) completed projects within the last ten (10) years of similar size, scope, and complexity to the work described in the Contract Documents for this project. Respondents should provide references with contact information to include a valid, recently verified email and telephone number for each project listed.

C. Project Approach, Schedule, and Availability (20 Points)
1. **Project Approach**
   a. Provide a narrative of the project approach describing how the Respondent will complete this project. Include key milestones, specific critical processes and critical path items, submittals and shop drawings, phases and/or sequencing, coordination of trades and disciplines, permits, approvals, coordination with the City of Alamo staff, coordination with other contractors and projects, coordination with permitting agencies and project stakeholders, and procurement of critical equipment and materials anticipated to complete the project work. Identify potential risks and describe proposed mitigation measures to ensure on-time completion of the Project.
   b. Availability of Key Personnel and Equipment.

D. Price (40 Points)
1. The Proposal with the lowest total price will receive forty (40) points. Proposals will receive a percentage of the forty (40) points based on a comparison with the lowest total price proposal as described below.

a. Computation Steps:
   1) Step 1. Determine lowest total price and award 40 points for price.
   2) Step 2. Calculate the ratio between the lowest total price and each proposal. Multiply the ratio by 40 to obtain the points earned.

Proposal	Price	Calculation	Points Earned
A	$37,934,850	(26,785,100/37,934,850) x 40	28.24
B	$26,785,100	(26,785,100/26,785,100) x 40	40.00
C	$34,620,000	(26,785,100/34,620,000) x 40	30.95
D	$30,740,600	(26,785,100/30,740,600) x 40	34.85
E	$27,550,325	(26,785,100/27,550,325) x 40	38.89

1.7 FORMAT OF PROPOSALS

A. Proposals shall be prepared simply and economically, providing a straightforward, concise description of the Respondent's ability to meet the requirements of this RFCSP. Emphasis shall be on the quality, completeness, clarity of content, responsiveness to the requirements, responsiveness to the evaluation criteria, and an understanding of the City of Alamo needs.

B. Respondents shall carefully read the information contained in this RFCSP and submit a complete response to all requirements and questions as directed. Incomplete Proposals will be considered non-responsive and subject to rejection.

C. Proposals and any other information submitted by Respondents in response to this RFCSP shall become the property of the City of Alamo.

D. Proposals shall be prepared using letter-size 8-1/2” x 11” pages. The project schedule may be provided using tabloid-size 11” x 17” paper.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

Evaluation Criteria Form

The intent of this document is to provide Respondents with a structure for their responses.

Respondents should provide answers to the questions below in order and spaces provided.

When responding to the questions below, Respondents should use the space provided in this form, unless otherwise indicated. If the Response Forms provided here are not utilized, the information provided by the Respondent will not be considered and the Respondent's score for the evaluation criteria in question may be reduced and/or Respondent's proposal may be deemed non-responsive.

If all fields are not completed, the proposal may be deemed non-responsive.

1. Team Qualifications and Experience (20 Points)

a. Organizational Structure and Information of the Prime Contractor

i. Provide current business organizational structure, type of business structure, and stability of organization.
(Provide answer here)

ii. Provide total number of employees and annual company revenues as of October 31, 2025 (Provide answer here)

iii. Provide Debarment history for the company for the last ten (10) years.
(Provide answer here)

iv. Provide any litigation, arbitration, and claims history for the last three (3) years and any litigation, arbitration, and claims history with the City of Alamo regardless of the year they occurred.
(Provide answer here or insert in the next page if additional space is needed)

(Insert here additional information regarding litigation, arbitration, and claims history in the last three (3) years, and any litigation, arbitration, and claims history with the City of Alamo regardless of the year they occurred.)

v. Indicate the number of years performing contracting/construction work under current legal business name and/or previous legal business name(s).
(Provide answer here)

b. Proposed Team Structure and Key Personnel Roles and Responsibilities

i. Provide a 1-page organizational chart that describes the composition of the team for this project. The chart shall include proposed Key Personnel for the Prime Contractor and subcontractor(s). The chart shall also include percent availability (as percentage of total individual's workload) for Prime Contractor's Key Personnel and their proposed role for the duration of the Project.

(Insert here the 1-page organizational chart that describes the composition of the team for this project.)

ii. Provide a clear description of the proposed team identifying Key Subcontractor(s), their role on the project, and teaming history. If the Prime Contractor has not worked previously with proposed Key Subcontractor(s), describe the proposed approach for ensuring successful completion of the project in accordance with Contract Documents.

Team Member	Company Name	Proposed Role	Worked with in the Past
Prime Contractor			
Key Subcontractor #1			☐ Yes ☐ No
Key Subcontractor #2			☐ Yes ☐ No
Key Subcontractor #3			☐ Yes ☐ No

Describe teaming history between Prime Contractor and proposed subcontractor(s):
(Provide answer here)

iii. Provide a clear description of the proposed team's Key Personnel roles and responsibilities, including Key Personnel from Key Subcontractor(s). Use the table provided below. Add rows as needed based on the proposed team composition for this project.

Team Member	Proposed Key Personnel Role	Name of Key Personnel	Included in Org Chart?
Prime Contractor	Project Manager		☐ Yes ☐ No
	Project Superintendent		☐ Yes ☐ No
	QC Manager		☐ Yes ☐ No
	Other:		☐ Yes ☐ No
Key Subcontractor #1	Project Manager		☐ Yes ☐ No
	Project Superintendent		☐ Yes ☐ No
	Other:		☐ Yes ☐ No
Key Subcontractor #2	Project Manager		☐ Yes ☐ No
	Project Superintendent		☐ Yes ☐ No
	Other:		☐ Yes ☐ No
Key Subcontractor #3	Project Manager		☐ Yes ☐ No
	Project Superintendent		☐ Yes ☐ No
	Other:		☐ Yes ☐ No

c. Qualifications and Experience of Key Personnel Proposed for this Project

i. *Using separate 8 ½" x 11" sheet(s), titled "Team Qualifications and Experience – Resume" inserted immediately following this Section:*
Provide resumes for the Prime Contractor's Key Personnel identified on the organizational chart, one per person, not to exceed one (1) page each with the Project Manager's resume being first.

As part of this criteria, use the check boxes below as a checklist to help ensure the information above is understood and information provided follows the guidelines listed above.

☐ Project Manager's resume is first
☐ Resumes for all Key Personnel for the Prime Contractor have been included
☐ Resumes for all Key Personnel for the Prime Contractor have been identified on the organizational chart
☐ Resumes for all Key Personnel for the Prime Contractor do not exceed one (1) page each
☐ All resumes provided include the following information:
- Name, job title, education
- Number of years of total professional experience
- Number of years/months with current firm
- Number of years/months of experience in proposed role for this project
- Description of professional qualifications to include degrees, licenses, certifications, and associations

- Brief overview of professional experience
- Detailed description of capabilities and experience relevant to this project
- List of all other active projects the team member is assigned to for the duration of the Project, to include the phase and percentage of time allocated to each of the other projects. For each project included in each resume, please clearly identify whether the project is with current firm or part of the person's past professional experience.

END OF TEAM QUALIFICATIONS AND EXPERIENCE CRITERIA

(Insert proposed Project Manager's Resume, 1 page.)

(If more resumes are to be included, please insert a page break and insert the 1-page resume for additional Key Personnel as required.

2. Quality, Reputation, and Ability to Deliver Projects on Schedule and within Budget (20 Points)

A. Please complete all the fields below. Contracts A-1, A-2, and A-3 shall be separate contracts.

Answer all questions completely and all information must be clear, accurate and comprehensive.

Contract A-1 is to have been completed by the Prime Contractor or Subcontractor.

□ Contract A-1 demonstrates completion of water or wastewater treatment plant rehabilitation or similar improvement project.

□ Contract A-1 was completed between 2019 and 2025.

Contract A-1 Description

Name of Contract:_____ Location:_____

Scope of Work:_____

Pipe Sizes:_____ Pipe Lengths:_____

*Owner Point of Contact (POC):_____ Owner POC Title:_____

Owner POC Phone Number:_____ Construction Cost:_____

Contract Start Date:_____ Contract End Date:_____

Additional Information:_____

*Owner is defined as entity performed work for (i.e. City, County, Utility, State, etc.)

Provide a specific name with contact information that has previously verified. The design engineer may not serve as reference.

If all fields are not completed, the Contractor is at risk for being rejected due to

Contract A-2 is to have been completed by the Prime Contractor or Subcontractor.

- □ Contract A-2 demonstrates completion of water or wastewater treatment plant rehabilitation or similar improvement project.
- □ Contract A-2 was completed between 2019 and 2025.
- □ Contract A-2 cannot be the same as Project A-1

Contract A-2 Description

Name of Contract:_____ Location:_____

Scope of Work:_____

Pipe Sizes:_____ Pipe Lengths:_____

*Owner Point of Contact (POC):_____ Owner POC Title:_____

Owner POC Phone Number:_____ Construction Cost:_____

Contract Start Date:_____ Contract End Date:_____

Additional Information:_____

*Owner is defined as entity performed work for (i.e. City, County, Utility, State, etc.)

Provide a specific name with contact information that has previously verified. The design engineer may not serve as reference.

If all fields are not completed, the Contractor is at risk for being rejected due to

Contract A-3 is to have been completed by the Prime Contractor or Subcontractor.

□ Contract A-3 demonstrates completion of a water steel coating tank or similar basin.

□ Contract A-3 was completed between 2019 and 2025.

□ Contract A-3 cannot be the same as Project A-1 or A-2

Contract A-3 Description

Name of Project:_____ Location:_____

Scope of Work:_____

Pipe Sizes:_____ Pipe Lengths:_____

*Owner Point of Contact (POC):_____ Owner POC Title:_____

Owner POC Phone Number:_____ Construction Cost:_____

Contract Start Date:_____ Contract End Date:_____

Additional Information:_____

*Owner is defined as entity performed work for (i.e. City, County, Utility, State, etc.)

Provide a specific name with contact information that has previously verified. The design engineer may not serve as reference.

END OF PROJECT APPROACH, SCHEDULE, AND AVAILABILITY CRITERIA

SECTION 00 41 13
PRICE PROPOSAL

PART 1 - GENERAL

1.1 PRICE PROPOSAL

PROPOSAL OF _____, a

corporation a partnership consisting of _____

an individual doing business as _____

Pursuant to Instructions and Invitation for Competitive Sealed Proposals, the undersigned proposes to furnish all labor and materials as specified and perform the work required for the project as specified, in accordance with the Plans and Specifications for the following prices in the bid proposal to wit:

PLEASE SEE ATTACHED LIST OF BID ITEMS.

RESPONDENT'S SIGNATURE & TITLE: _____

FIRM'S NAME: _____

FIRM'S ADDRESS: _____

FIRM'S PHONE NO./FAX NO.: _____

FIRM'S EMAIL ADDRESS: _____

The Contractor herein acknowledges receipt of the following: **Addendum No(s).** _____

OWNER RESERVES THE RIGHT TO ACCEPT THE OVERALL MOST RESPONSIBLE BID.

The bidder offers to construct the Project in accordance with the Contract Documents for the contract price, and to complete the Project within **150** calendar days after the start date, as set forth in the Authorization to Proceed. **The bidder understands and accepts the provisions of the contract Documents relating to liquidated damages of the project if not completed on time.**

Complete the additional requirements of the Price Proposal which are included on the following pages.

Attachment A – Price Proposal Form

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

ATTACHMENT A – PRICE PROPOSAL FORM

PRICE PROPOSAL

Item	Description	Unit	Quantity	Unit Price	Total
CLARIFIER NO. 1					
1	ClariCone® Clarifier No. 1 (Interior Coating)	LS	1	$	$
2	ClariCone® Clarifier No. 1 (Exterior Coating)	SF	3,000	$	$
3	ClariCone® Clarifier No. 1 (Walkway Bridge Coating)	LS	1	$	$
4	Slurry Concentrator Air Release and Level Guide Replacement	EA	1	$	$
5	Slurry Concentrator Support Assembly Replacement	EA	1	$	$
6	Sampling Coupling Replacement	EA	1	$	$
7	Concentrator Lift Tube and Actuator Assembly	EA	1	$	$
8	Radial Trough Operator Assembly	EA	1	$	$
9	*Remove and Dispose of Sludge	Ton	80	$	$
CLARIFIER NO. 2					
10	Slurry Concentrator Air Release and Level Guide Replacement	EA	1	$	$
11	Slurry Concentrator Support Assembly Replacement	EA	1	$	$
12	Sampling Coupling Replacement	EA	1	$	$
13	*Remove and Dispose of Sludge	Ton	80	$	$
				TOTAL (Item 1 to 13)	$

*Contractor is required to submit proof to confirm the volume of sludge removed and disposed of on-site at the existing sludge holding pond . Payment will be based on actual tons of sludge disposed.

Item	Description	Unit	Quantity	Unit Bid Price	Total
CLARIFIER NO. 2 ALLOWANCE					
14	Repair Effluent Weir Trough Allowance	ALW	1	$ 25,000.00	$ 25,000.00
				TOTAL (Item 14)	$ 25,000.00

Item	Description	Unit	Quantity	Unit Price	Total
15	Mobilization & Demobilization (Max 6% of Line Items 1 to 13)	LS	1	$	$
16	**Intermediate Demobilization and Remobilization	EA	1	$	$
				TOTAL MOBILIZATION AND DEMOBILIZATION (Items 15-16)	$

Mobilization and demobilization lump sum bid shall be limited to a maximum 6% of the line item 1-13 Sub-Total Base Bid Amount.

The line item 1-13 Sub-total base bid is defined as all bid items EXCLUDING Item 14 Replace Effluent Weir Trough, Item 15 – Mobilization and Demobilization, Item 16- Intermediate Demobilization and Remobilization.

** This item shall govern CONTRACTOR expenses for an OWNER-directed intermediate Project demobilization of personnel and equipment that occurs after the Contract Notice to Proceed has been given and work has been commenced, and the subsequent remobilization of personnel and equipment to complete the project. Related work shall include furnishing all labor, materials, tools, equipment, testing, and incidentals required to demobilize and remobilize for the Project. **Each Intermediate Demobilization and Remobilization shall only be authorized and paid upon a written directive by OWNER.**

In the event of a discrepancy between the written percentage and dollar amount shown for Mobilization and Demobilization written percentage will govern. If the percentage written exceeds the allowable maximum stated for mobilization and demobilization, Owner reserves the right to cap the amount at the percentages shown and adjust the extensions of the bid items accordingly.

TOTAL PRICE PRICE (TO INCLUDE LINE ITEMS 1-13, 14, and 15-16)	$

Deductive and Additive Alternates: Owner reserves the right to accept or reject the following alternate(s). The decision to accept or reject will be made once Engineer, Contractor, and Owner have the opportunity to inspect effluent weir trough once Clarifier No. 1 is dewatered and cleaned. The total for each alternate should be the full price for the alternate separate from pricing included in the Total Bid Price. In addition, Mobilization/Demobilization shall be inclusive to each alternate's Total.

ADDITIVE ALTERNATE No. 1- Owner reserves the right to accept or reject the following additive alternate.					
Item	**Description**	**Unit**	**Quantity**	**Unit Price**	**Total**
CLARICONE® CLARIFIER NO. 1					
17	Remove and Replace Effluent Weir Trough	EA	1	$	$
				TOTAL ADDITIVE ALTERNATIVE (Item 17)	$

*****CLARICONE® CLARIFIER EQUIPMENT PRICING** **$_____**

*** Contractor shall include pricing of all replacement components to the two (2) ClariCone® Clarifiers as shown on the plans and specified in the contract documents for transparency purposes. Pricing must be included but will not impact selection.

Receipt is hereby acknowledged of the following addenda to the Contract Document:

Addendum No. 1: _____

Addendum No. 2: _____

SECTION 00 41 15
PROPOSAL CERTIFICATION

PART 1 - GENERAL

1.1 PROPOSAL CERTIFICATION

Accompanying this proposal is a Bid Bond or Certified or Cashier's Check payable to the Order of The City of Alamo, for_____dollars ($_____), which amount represents five percent (5%) of the total bid price. Said bond or check is to be returned to the bidder unless the proposal is accepted and the bidder fails to execute and file a contract within **10** calendar days after the award of the Contract, in which case the check shall become the property of said City of Alamo, and shall be considered as payment for damages due to delay and other inconveniences suffered by said City of Alamo due to the failure of the bidder to execute the contract. The City of Alamo reserves the right to reject any and all bids.

It is anticipated that the Owner will act on this proposal within **90** calendar days after the bid opening. Upon acceptance and award of the contract to the undersigned by the Owner, the undersigned shall execute Contract Documents and make Performance and Payment Bonds for the full amount of the contract within **10** calendar days after the award of the Contract to secure proper compliance with the terms and provisions of the contract, to insure and guarantee the work until final completion and acceptance, and the guarantee period stipulated, and to guarantee payment of all lawful claims for labor performed and materials furnished in the fulfillment of the contract.

It is anticipated that the Owner will provide written Authorization to Proceed within **30** days after the award of the contract.

The work called for in this Contract shall commence on the date indicated in the Notice to Proceed (NTP) Under no circumstances shall the work commence prior to the date provided in written NTP. Work shall be completed in full within **150** consecutive calendar days.

Signed: _____
Company Representative

_____
Company Name

_____

_____
Address

Please return bidder's check to: _____
Company Name

_____

_____
Address

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

SECTION 00 43 13
BID BOND

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. This section describes the standard bid bond form to be submitted with the bid on the project.

1.2 BID BOND FORM

A. Bidder is to inset an original bid bond or a copy of cashier's check provided for bid bond Purposes. Original check is to be submitted along with bid.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION

3.1 GENERAL

A. Standard Form follows.

END OF SECTION

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we the undersigned *(Contractor)* as Principal, and *(Surety)* _____ as Surety, are hereby held and firmly bound unto the CITY OF ALAMO as OWNER in the penal sum of *five percent (5% of bid amount)* _____ for the payment of which sum, well and truly to be made, we hereby jointly and severally bind ourselves, successors and assigns.

Signed, this _____ day of _____, 202_.
(Day) (Month)

The Condition of the above obligation is such that whereas the Principal has submitted to the **CITY OF ALAMO** a certain BID, attached hereto and hereby made a part hereof to enter into a contract in writing for the construction

CITY OF ALAMO WATER TREATMENT PLANT REHABILITATION AND PROTECTIVE COATING
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NOW, THEREFORE,

(A. If said BID shall be rejected, or in the alternate

(B. If said BID shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attached hereto (properly completed in accordance with said BID) and shall furnish a BOND for his faithful performance of said contract, and for the payment of all persons performing labor or furnishing materials in connection therewith and shall in all other respects perform the agreement created by the acceptance of said BID then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its BOND shall be in no way impaired or affected by any extension of the time within which the OWNER may accept such BID; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

_____ _____
Principal Witness

_____
Title

_____ _____
Surety Witness

_____
By: Attorney-in-Fact

IMPORTANT - Surety companies executing BONDS must be authorized to transact business in the State where the project is located.

SECTION 00 51 00
NOTICE OF AWARD

PART 1 - GENERAL

1.1 NOTICE TO RESPONDENT

A. This section describes the standard Notice of Award form for use in the project.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION

3.1 GENERAL

A. Standard form follows.

END OF SECTION

NOTICE OF AWARD

MONTH DAY, 202_

******Company Name** **E-Mail Address: *******
*****Contact, Title**
*****Address**
****City, TX ZIP**

RE: **CITY OF ALAMO WATER TREATMENT PLANT REHABILITATION AND PROTECTIVE COATING PHASE 1B**

Mr. ******,

This letter serves to officially inform you that your company was awarded the above referenced Construction Contract in the amount of $_____. The contract shall commence upon issuance of NTP dated and completed within **150** calendar days.

Attached please find three (3) sets of contracts for execution. Signed contract documents, and insurances must be submitted to the undersigned within ten (10) days of notification/receipt of this letter. Required insurance(s) shall remain active for the duration of the contract period.

Properly executed Payment and Performance Bonds shall be required and in strict accordance as outlined in the Instructions to Bidders.

Contract documents must be as follows:

1. **Three (3)** original construction contracts must be submitted with the correct Contractor's legal name as registered with the Texas Secretary of State.
2. The parties to the construction contract must between the **CITY OF ALAMO** and the CONTRACTOR'S legal name.
3. Performance and Payment Bonds must be provided in the amount of 100% of the contract award amount (correct contractor's legal name as registered with the Texas Secretary of State).
4. Insurance certificate must be provided and kept up-to-date with the **CITY OF ALAMO** named as the additional insured to include a waiver of subrogation, in favor of the **CITY OF ALAMO**.
5. List of subcontractors with proper certificates of insurance must be provided.

Respectfully,

XXXXXX

APPROVAL OF SUB-CONTRACTORS

CITY OF ALAMO WATER TREATMENT PLANT REHABILITATION AND PROTECTIVE COATING PHASE 1B

Prime contractors will not permit any Sub-contractor to start work on the project until the Sub-contractor has been approved by the project owner.

NAME AND ADDRESS OF PRIME CONTRACTOR:

_____ _____

_____ _____

SUB-CONTRACT DATA

NUMBER	TYPE OF WORK	SUB-CONTRACTORS NAME & ADDRESS	CONTRACT AMOUNT	ANTICIPATED START DATE	ANTICIPATED END DATE

CERTIFICATION BY PRIME CONTRACTOR

Each Sub-contractor listed above has established his/her ability and responsibility to perform the work to which the sub-contract relates. The applicable provisions of the contract, including labor and equal opportunity provisions, shall govern the work to which the subcontract relates, and each subcontractor has been advised as to the necessary contract provisions and the requirement to incorporate them in each subcontract.

_____ _____

CONTRACTOR DATE

APPROVED:	CONCUR:

END OF SECTION

SECTION 00 52 00
AGREEMENT

STATE OF TEXAS
COUNTY OF KENDALL

THIS AGREEMENT made and entered into this the ___ day of _____A.D., 202_, by and between the **CITY OF ALAMO.** of the State of Texas, First Part, hereinafter called OWNER, and _____ _____, _____, Party of the Second Part hereinafter termed CONTRACTOR.

WITNESSETH, that the CONTRACTOR and the OWNER for the consideration hereinafter named agree as follows:

ARTICLE 1. SCOPE OF WORK:

The CONTRACTOR shall under the terms stated in the general conditions furnish all the materials, supplies, machinery, equipment, tools, superintendence, labor, insurance, and other accessories shown on addendums, drawings as described in the specifications for the following project.

CITY OF ALAMO WATER TREATMENT PLANT REHABILITATION AND PROTECTIVE COATING PHASE 1B

ARTICLE 2. INSURANCE AND BONDS:

The contractor shall according to the specifications shall provide Performance and Payment Bonds and Insurance during the duration of the project.

ARTICLE 3. TIME OF COMPLETION:

The OWNER shall provide a Notice to Proceed in which a date for commencement of the work shall be stated; such commencement date shall be **ten (10) days** after the date of the notice. The Contractor shall achieve substantial completion of the work within **One Hundred Twenty (120) calendar days** for initial task order after such commencement date (future task orders shall express commencement date & completion date "as needed") and completion within **Thirty (30) calendar days** after the substantial completion. The completion date may be extended by approved Change Orders.

If the contractor fails to complete this contract in the calendar days specified, the time charge will be made for each calendar day thereafter.

The time set forth in the proposal for the completion of the work is an essential element of the contract. For each calendar day in addition to the calendar days herein before stated as extended by the Owner, the amount per day given in the following schedule will be deducted from the money due or to become due to the Contractor not as a penalty, but as added expense for Engineering/Architectural supervision.

ARTICLE 4. LIQUIDATED DAMAGES:

In the event the CONTRACTOR fails to attain substantial completion of the project within the time (plus extensions of time) set forth in the Proposal, the OWNER may withhold money permanently from the CONTRACTOR'S total compensation as liquidated damages and for added expenses for inspection services, etc. The amount withheld as liquidated damages shall be the sum of two hundred fifty dollars ($250.00) per day for every calendar day beyond the specified number of calendar days (plus extensions of time) agreed upon for the substantial completion of the work herein specified and contracted for. If the time of completion exceeds 30 calendar days beyond the specified number of calendar days (plus extensions of time) agreed upon for the substantial completion of the work herein specified and contracted for, then the OWNER may withhold permanently from the CONTRACTOR'S total compensation for the work under this Contract the sum of five hundred dollars ($500.00) per day for every calendar day beyond the specified number of calendar days (plus extensions of time) agreed upon for substantial completion of the work starting on the 31st day past the specified number of calendar days agreed upon for the substantial completion of the work. The OWNER will be the sole judge as to whether the work has been completed within or before the allotted time. This remedy shall not be considered as OWNER'S exclusive remedy.

ARTICLE 5. INSPECTION AND TESTING:

The OWNER, ENGINEER, Inspectors or testing firm may not be available on weekends or holidays. CONTRACTOR is to notify these personnel 48 hours prior to working on these days or limit work activity such that these personnel are not required. Under no circumstances is the CONTRACTOR allowed to perform work requiring the OWNER, ENGINEER, Inspector, or testing firm on weekends or holidays without proper notification and approval.

ARTICLE 6. CONTRACT TIME EXTENSION:

Under a Calendar Day Contract, CONTRACTOR may also be granted an extension of time because of unusual inclement weather, which is beyond the normal weather recorded and expected for Alamo, Texas. Normal rainfall compiled by the State climatologist, based on U.S. Weather Bureau Records for Alamo, Texas, is considered a part of the Calendar Day Contract, and it not a justification for an extension of time. Listed as follows are the mean number of days in which there occurred 0.01 in or more of precipitation:

January	8 days
February	8 days
March	7 days
April	7 days
May	9 days
June	6 days
July	5 days
August	5 days
September	7 days
October	7 days
November	7 days
December	7 days

Rain days per month in amounts exceeding the number of days shown above may be credited as a Rain Day if a Claim is made in accordance with Section 00 72 00, EJCDC Article 4.05 of the Contract and meets the following definition: a “Rain Day” is any day in which a rain event occurs at the site and is sufficient to prevent the CONTRACTOR from performing units of Work critical to maintaining the

project schedule. Total Rain Days during the Contract Time will be considered cumulatively for the purpose of calculating extensions to the Contract Time.

ARTICLE 7. SCOPE OF THE WORK AND CONTRACT SUM:

The Contractor hereby agrees to furnish all of the materials and all of the equipment and labor necessary and to perform all of the work shown on the drawings and described in the specifications for the Project entitled **CITY OF ALAMO WATER TREATMENT PLANT REHABILITATION AND PROTECTIVE COATING PHASE 1B**
for the contract amount of **$**_____, Written in words _____ Dollars.

(a) Drawings prepared for same by **Garcia Infrastructure Consultants, LLC**

(b) Specifications consisting of:

1. "Standard General Specifications" issued by the City of Alamo and as issued in the contract documents.
2. The "General Conditions for Engineering/Architectural Construction".
3. Addenda
   NO. _____ DATED _____

   NO _____ DATED _____

ARTICLE 5. AWARD OF CONTRACT:

This Agreement is a contract for the services of Construction, and Contractor's interest in this Agreement, duties hereunder and/or fees due hereunder may not be assigned or delegated to a third party.

This Agreement supersedes all prior agreements, written or oral, between Contractor and Owner and shall constitute the entire Agreement and understanding between parties with respect to the project. This Agreement and each of its provisions shall be binding upon the parties and may not be waived, modified, amended or altered except by a writing signed by Contractor and Owner.

BY SIGNING BELOW, the parties have executed and bound themselves to this Agreement as of the day and year first above written.

CONTRACTOR	**CITY OF ALAMO**
By: _____	By: _____
Authorized Signor	Authorized Signor
_____	_____
(name) – (title)	*(name) – (title)*
Date: _____	Date: _____
ATTEST:	
By: _____	By: _____
Signature	Signature

(name) – (title)	*(name) – (title)*

END OF SECTION

SECTION 00 55 00
NOTICE TO PROCEED

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. This section describes the standardized Notice to Proceed (NTP) form for use in the project. Refer to **Attachment A**.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

ATTACHMENT A – NOTICE TO PROCEED LETTER

NOTICE TO PROCEED

Date

Contractor
Attn: Owner
Address
City, State Zip Code

RE: **CITY OF ALAMO WATER TREATMENT PLANT REHABILITATION AND PROTECTIVE COATING PHASE 1B**

Contract Amount: $_____

This is to inform you that **(contractor)** may proceed with the construction of the above referenced project as of **(date).** The construction period for this project will be **(word) (number)** consecutive calendar days. The construction time will expire on **(date)**. Please review and abide by the construction plans and specifications throughout the execution of the work. Please submit a proposed construction schedule pursuant to the specifications.

_____
XXXXXXXX
XXXX

CC:

SECTION 00 61 13
PERFORMANCE AND PAYMENT BOND

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. This section describes the standard performance and payment bond form to be submitted with the bid for the project.

1.2 PERFORMANCE AND PAYMENT BOND (OR BONDS)

A. Following the current Section, CONTRACTOR shall insert the approved form of the statutory surety bond or bonds to ensure the performance of the Contract and payment of labor and materials. In addition to the corporation signatures of the surety company(ies) on the bond(s), each bond should be countersigned by the surety company's attorney-in-fact, authorize to act within the State in which the Project is situated.

B. The following form is provided for sample purposes only. Contracts and agreements have important legal consequences. It is imperative that you consult with your attorney concerning the proper drafting, completion, or modification of such documents.

1.3 PERFORMANCE BOND REQUIREMENTS

A. Pursuant to the Texas Uniform Grant and Contract Management Act of 1981, the following minimum requirements apply to all contracts exceeding $25,000 in total value:
   1. Performance bond on the part of the CONTRACTOR for 100% percent of the contract price. A "performance bond" is one executed in connection with a contract to secure fulfillment of all the contractor's obligations under the contract. Only if specifically noted in the Instructions to Respondents (Section 00 21 13), for contracts under $50,000, Owner may exercise an option of withholding payment to construction contractors until completion of construction and acceptance of work by the Owner in lieu of such performance bonds.
   2. A payment bond on the part of the CONTRACTOR for 100% percent of the contract price. A "payment bond" is one executed in connection with a contract to assure payment as required by law of all persons supplying labor and material in the execution of the work provided for in the contract.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION

3.1 GENERAL

A. Standard forms follow.

END OF SECTION

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS, THAT _____

_____
(Name of Contractor or Company)

_____
(Address)

a _____ hereinafter called Principal, and
(Corporation/Partnership)

_____
(Name of Surety Company)

_____
(Address)

hereinafter called Surety, are held and firmly bound unto _____

_____
(Name of Recipient)

_____
(Recipient's Address)

hereinafter called OWNER, in the penal sum of no less than 100% of the contract price _____**(**_____**),** dollars in lawful money of the United States, for the payment of which sum we bind ourselves, our successors, and assigns, jointly and severally, by these presents, and shall remain in effect for one year beyond the date of approval by the political subdivision's engineer.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the OWNER dated the _____ day of _____, 202__, a copy of which is hereto attached and made part thereof for the construction of:

CITY OF ALAMO WATER TREATMENT PLANT REHABILITATION AND PROTECTIVE COATING PHASE 1B

PERFORMANCE BOND

NOW THEREFORE, if the Principal shall well, truly and faithfully perform its duties in all the undertakings, covenants, terms, conditions, and agreement of said contract during the original term thereof, and any extensions thereof which may be granted by the OWNER, with or without notice to the Surety and during the one year guaranty period, and if it shall satisfy all claim and demands incurred under such contract, and shall fully indemnify and save harmless the OWNER from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the OWNER all outlay and expense which the OWNER may incur in making good any default, then this obligation shall be void, otherwise to remain in full force and effect.

PROVIDED FURTHER, that the said Surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to WORK to be performed thereunder or the SPECIFICATIONS accompanying the same shall in any way affect its obligation on this BOND, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the WORK or to the SPECIFICATIONS.

PROVIDED, FURTHER, that no final settlement between the OWNER and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in four counterparts, each one of which shall be deemed an original, this the _____day of _____A.D., 20_____.

	_____ Principal
ATTEST:	
_____ (Principal) Secretary (SEAL)	_____ Signature
_____ Witness as to Principal	_____ (Print/Type Name)
_____ (Address)	_____ (Address)
ATTEST:	_____ Surety
_____ (Surety) Secretary (SEAL)	_____ Attorney-in-Fact (Signature)
_____ Witness as to Surety	_____ (Print/Type Name)
_____ (Address)	_____ (Address)

NOTE: Date of Bond must not be prior to date of Contract (1) Correct name of Contractor; (2) A Corporation, a Partnership or an Individual, as case may be; (3) Correct name of Surety; (4) Correct name of Owner; (5) County or Parish and State; (6) Owner; (7) If Contractor is Partnership, all partners should execute bond.

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS, THAT _____

_____
(Name of Contractor or Company)

_____
(Address)

a _____ hereinafter called Principal, and
(Corporation/Partnership)

_____
(Name of Surety Company)

_____
(Address)

hereinafter called Surety, are held and firmly bound unto _____

_____
(Name of Recipient)

_____
(Recipient's Address)

hereinafter called OWNER, in the penal sum of no less than 100% of the contract price **( ) (_____),** dollars in lawful money of the United States, for the payment of which sum we bind ourselves, our successors, and assigns, jointly and severally, by these presents and remain if effect for one year beyond the date of approval by the political subdivision's engineer.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the OWNER dated the _____ day of _____, 202___, a copy of which is hereto attached and made part thereof for the construction of:

CITY OF ALAMO WATER TREATMENT PLANT REHABILITATION AND PROTECTIVE COATING PHASE 1B

NOW THEREFORE, if the Principal shall promptly make payment to all persons, firms, SUB-CONTRACTORS, and corporations furnishing materials for or performing labor in the prosecution of the WORK provided for in such contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such WORK, and all insurance premiums on said WORK, and for all labor, performed in such WORK whether by SUB-CONTRACTOR or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

PAYMENT BOND

PROVIDED FURTHER, that the said Surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to WORK to be performed thereunder or the SPECIFICATIONS accompanying the same shall in any way affect its obligation on this BOND, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the WORK or to the SPECIFICATIONS.

PROVIDED, FURTHER, that no final settlement between the OWNER and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in four counterparts, each one of which shall be deemed an original, this the _____day of _____A.D., 202_____.

	Principal
ATTEST:	
(Principal) Secretary (SEAL)	Signature
Witness as to Principal	(Print/Type Name)
(Address)	(Address)
ATTEST:	Surety
(Surety) Secretary (SEAL)	Attorney-in-Fact (Signature)
Witness as to Surety	(Print/Type Name)
(Address)	(Address)

NOTE: Date of Bond must not be prior to date of Contract (1) Correct name of Contractor; (2) A Corporation, a Partnership or an Individual, as case may be; (3) Correct name of Surety; (4) Correct name of Owner; (5) County or Parish and State; (6) Owner; (7) If Contractor is Partnership, all partners should execute bond.

SECTION 00 65 36
WARRANTY AND FINAL PAYMENT

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. This section describes the warranty and final payment. The conditions contained in this Section are specific administrative and policy requirements in addition to the general conditions and other requirements listed in the contract documents.

1.2 CONTRACTOR'S WARRANTY OF TITLE

A. CONTRACTOR warrants and guarantees that all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to OWNER no later than the time of payment free and clear of all Liens.

1.3 SUBSTANTIAL COMPLETION

A. When CONTRACTOR considers the entire Work ready for its intended use CONTRACTOR shall notify OWNER and ENGINEER in writing that the entire Work is substantially complete (except for items specifically listed by CONTRACTOR as incomplete) and request that ENGINEER issue a certificate of Substantial Completion. Promptly thereafter, OWNER, CONTRACTOR and ENGINEER shall make an inspection of the Work to determine the status of completion. If ENGINEER does not consider the Work substantially complete, ENGINEER will notify CONTRACTOR in writing giving the reasons therefore. If ENGINEER considers the Work substantially complete, ENGINEER will prepare and deliver to OWNER a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment.

B. OWNER shall have seven days after receipt of the tentative certificate during which to make written objection to ENGINEER as to any provisions of the certificate or attached list. If, after considering such objections, ENGINEER concludes that the Work is not substantially complete, ENGINEER will within 14 days after submission of the tentative certificate to OWNER notify CONTRACTOR in writing, stating the reasons therefore. If, after consideration of OWNER's objections, ENGINEER considers the Work substantially complete, ENGINEER will within said 14 days execute and deliver to OWNER and CONTRACTOR a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as ENGINEER believes justified after consideration of any objections from OWNER.

C. At the time of delivery of the tentative certificate of Substantial Completion ENGINEER will deliver to OWNER and CONTRACTOR a written recommendation as to division of responsibilities pending final payment between OWNER and CONTRACTOR with respect to security, operation, safety and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless OWNER and CONTRACTOR agree otherwise in writing and so inform ENGINEER in writing prior to ENGINEER's issuing the definitive certificate of Substantial Completion, ENGINEER's aforesaid recommendation will be binding on OWNER and CONTRACTOR until final payment.

1.4 PARTIAL UTILIZATION

A. Use by OWNER at OWNER's option of any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which OWNER, ENGINEER, and CONTRACTOR agree constitutes a separately functioning and usable part of the Work that can be used by OWNER for its intended purpose without significant interference with CONTRACTOR's performance of the remainder of the Work, may be accomplished prior to Substantial Completion of all the Work subject to the following conditions.

B. OWNER at any time may request CONTRACTOR in writing to permit OWNER to use any such part of the Work which OWNER believes to be ready for its intended use and substantially complete. If CONTRACTOR agrees that such part of the Work is substantially complete, CONTRACTOR will certify to OWNER and ENGINEER that such part of the Work is substantially complete and request ENGINEER to issue a certificate of Substantial Completion for that part of the Work. CONTRACTOR at any time may notify OWNER and ENGINEER in writing that CONTRACTOR considers any such part of the Work ready for its intended use and substantially complete and request ENGINEER to issue a certificate of Substantial Completion for that part of the Work. Within a reasonable time after either such request, OWNER, CONTRACTOR, and ENGINEER shall make an inspection of that part of the Work to determine its status of completion. If ENGINEER does not consider that part of the Work to be substantially complete, ENGINEER will notify OWNER and CONTRACTOR in writing giving the reasons therefore. If ENGINEER considers that part of the Work to be substantially complete, the above provisions will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto. No occupancy or separate operation of part of the Work may occur prior to compliance with the requirement of regarding property insurance.

1.5 FINAL INSPECTION

A. Upon written notice from CONTRACTOR that the entire Work or an agreed portion thereof is complete, ENGINEER will promptly make a final inspection with OWNER, and CONTRACTOR and will notify CONTRACTOR in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. CONTRACTOR shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

1.6 FINAL PAYMENT

A. Application for Payment

1. After CONTRACTOR has, in the opinion of ENGINEER, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, Bonds, certificates or other evidence of insurance certificates of inspection, marked-up record documents and other documents, CONTRACTOR may make application for final payment following the procedure for progress payments.
2. The final Application for Payment shall be accompanied (except as previously delivered) by: (i) all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required (ii) consent of the surety, if any, to final payment; and (iii) complete and legally effective releases or waivers (satisfactory to OWNER) of all Lien rights arising out of or Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified above and as approved by OWNER, the CONTRACTOR may furnish receipts or releases in full and an affidavit of CONTRACTOR that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which OWNER or OWNER's property might in any way be responsible have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, CONTRACTOR may furnish a Bond or other collateral satisfactory to OWNER to indemnify OWNER against any Lien.
4. If, on the basis of ENGINEER's observation of the Work during construction and final inspection, and ENGINEER's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, ENGINEER is satisfied that the Work has been completed and CONTRACTOR's other obligations under the Contract Documents have been fulfilled, ENGINEER will, within ten days after receipt of the final Application for Payment, indicate in writing ENGINEER's recommendation of payment and present the Application for Payment to OWNER. At the same time ENGINEER will also give written notice to OWNER and CONTRACTOR that the Work is acceptable subject to the above provisions. Otherwise, ENGINEER will return the Application for Payment to CONTRACTOR, indicating in writing the reasons for refusing to recommend final payment, in which case CONTRACTOR shall make the necessary corrections and resubmit the Application for Payment.
5. Payment becomes due within thirty days after approval, the amount recommended by ENGINEER will become due and, when due, will be paid by OWNER to CONTRACTOR.

6. If, through no fault of CONTRACTOR, final completion of the Work is significantly delayed, and if ENGINEER so confirms, OWNER shall, upon receipt of CONTRACTOR's final Application for Payment and recommendation of ENGINEER, and without terminating the Agreement, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by OWNER for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if Bonds have been furnished as required above, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by CONTRACTOR to ENGINEER with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

1.7 WAIVER OF CLAIMS

A. The making and acceptance of final payment will constitute:
   1. A waiver of all Claims by OWNER against CONTRACTOR, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to the above, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from CONTRACTOR's continuing obligations under the Contract Documents; and
   2. A waiver of all Claims by CONTRACTOR against OWNER other than those previously made in writing which are still unsettled.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the controlling Laws and Regulations.

SECTION 00 72 00

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

EJCDC®
ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

Issued and Published Jointly by

ACEC
AMERICAN COUNCIL OF ENGINEERING COMPANIES

ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

National Society of Professional Engineers®

These General Conditions have been prepared for use with the Agreement Between Owner and Contractor for Construction Contract (EJCDC® C-520, Stipulated Sum, or C-525, Cost-Plus, 2013 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other.

To prepare supplementary conditions that are coordinated with the General Conditions, use EJCDC's Guide to the Preparation of Supplementary Conditions (EJCDC® C-800, 2013 Edition). The full EJCDC Construction series of documents is discussed in the Commentary on the 2013 EJCDC Construction Documents (EJCDC® C-001, 2013 Edition).

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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.

2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.

3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

5. *Bidder*—An individual or entity that submits a Bid to Owner.

6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.

7. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.

8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.

9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.

10. *Claim*—(a) A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein: seeking an adjustment of Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract; or (b) a demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal; or seeking resolution of a contractual issue that Engineer has declined to address. A demand for money or services by a third party is not a Claim.

11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to (a) the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq. ("CERCLA"); (b) the Hazardous Materials Transportation Act, 49 U.S.C. §§5501 et seq.; (c) the Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. ("RCRA"); (d) the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq.; (e) the Clean Water Act, 33 U.S.C. §§1251 et seq.; (f) the Clean Air Act, 42 U.S.C. §§7401 et seq.; or (g) any other federal, state, or local statute, law, rule, regulation, ordinance, resolution, code, order, or decree regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.

12. *Contract*—The entire and integrated written contract between the Owner and Contractor concerning the Work.

13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.

14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents. .

15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.

16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.

17. *Cost of the Work*—See Paragraph 13.01 for definition.

18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.

19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.

20. *Engineer*—The individual or entity named as such in the Agreement.

21. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.

22. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated in the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, does not establish a Hazardous Environmental Condition.

23. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

24. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.

25. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date or by a time prior to Substantial Completion of all the Work.

26. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.

27. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.

28. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.

29. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.

30. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.

31. *Project Manual*—The written documents prepared for, or made available for, procuring and constructing the Work, including but not limited to the Bidding

Documents or other construction procurement documents, geotechnical and existing conditions information, the Agreement, bond forms, General Conditions, Supplementary Conditions, and Specifications. The contents of the Project Manual may be bound in one or more volumes.

32. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative or "RPR" includes any assistants or field staff of Resident Project Representative.

33. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.

34. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer's review of the submittals and the performance of related construction activities.

35. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

36. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.

37. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands furnished by Owner which are designated for the use of Contractor.

38. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.

39. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.

40. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

41. *Successful Bidder*—The Bidder whose Bid the Owner accepts, and to which the Owner makes an award of contract, subject to stated conditions.

42. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.

43. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.

44. *Technical Data*—Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (a) subsurface conditions at the Site, or physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) or (b) Hazardous Environmental Conditions at the Site. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then the data contained in boring logs, recorded measurements of subsurface water levels, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical or environmental report prepared for the Project and made available to Contractor are hereby defined as Technical Data with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06.

45. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including but not limited to those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, fiber optic transmissions, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

46. *Unit Price Work*—Work to be paid for on the basis of unit prices.

47. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.

48. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

1.02 *Terminology*

A. The words and terms discussed in the following paragraphs are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

B. *Intent of Certain Terms or Adjectives*:

1. The Contract Documents include the terms "as allowed," "as approved," "as ordered," "as directed" or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.

C. *Day*:

1. The word "day" means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective*:

1. The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it:

    a. does not conform to the Contract Documents; or

    b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or

    c. has been damaged prior to Engineer's recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or 15.04).

E. *Furnish, Install, Perform, Provide*:

1. The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word "install," when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words "perform" or "provide," when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words "furnish," "install," "perform," or "provide," then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.

F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

A. *Bonds*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.

B. *Evidence of Contractor's Insurance*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract), the certificates and other evidence of insurance required to be provided by Contractor in accordance with Article 6.

C. *Evidence of Owner's Insurance*: After receipt of the executed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or otherwise), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

2.02 *Copies of Documents*

A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully executed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.

B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 *Before Starting Construction*

A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise specifically required by the Contract Documents), Contractor shall submit to Engineer for timely review:

1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;

2. a preliminary Schedule of Submittals; and

3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.

B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 *Initial Acceptance of Schedules*

A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.03.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.

1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.

3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.

2.06 *Electronic Transmittals*

A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may transmit, and shall accept, Project-related correspondence, text, data, documents, drawings, information, and graphics, including but not limited to Shop Drawings and other submittals, in electronic media or digital format, either directly, or through access to a secure Project website.

B. If the Contract does not establish protocols for electronic or digital transmittals, then Owner, Engineer, and Contractor shall jointly develop such protocols.

C. When transmitting items in electronic media or digital format, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the items, or from those established in applicable transmittal protocols.

ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

A. The Contract Documents are complementary; what is required by one is as binding as if required by all.

B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents.

C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic or digital versions of the Contract Documents (including any printed copies derived from such electronic or digital versions) and the printed record version, the printed record version shall govern.

D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.

E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.

3.02 *Reference Standards*

A. Standards Specifications, Codes, Laws and Regulations

1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard specification, manual, reference standard, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*:

1. *Contractor's Verification of Figures and Field Measurements*: Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.

2. *Contractor's Review of Contract Documents*: If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.

3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies*:

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:

a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or

b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Requirements of the Contract Documents*

A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work thereunder.

B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.

C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly give written notice to Owner and Contractor that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

3.05 *Reuse of Documents*

A. Contractor and its Subcontractors and Suppliers shall not:

1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions

of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or

2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.

B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Contract, whichever date is earlier.

4.02 *Starting the Work*

A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to such date.

4.03 *Reference Points*

A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.04 *Progress Schedule*

A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.

1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 11.

B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

4.05 *Delays in Contractor's Progress*

A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Times and Contract Price. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.

C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:

1. severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;

2. abnormal weather conditions;

3. acts or failures to act of utility owners (other than those performing other work at or adjacent to the Site by arrangement with the Owner, as contemplated in Article 8); and

4. acts of war or terrorism.

D. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or

indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5.

E. Paragraph 8.03 governs delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.

F. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor.

G. Contractor must submit any Change Proposal seeking an adjustment in Contract Price or Contract Times under this paragraph within 30 days of the commencement of the delaying, disrupting, or interfering event.

ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *Availability of Lands*

A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.

B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

5.02 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas*:

1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the

performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.

2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.12, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or at law; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.

B. *Removal of Debris During Performance of the Work*: During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

C. *Cleaning*: Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

D. *Loading of Structures*: Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.

5.03 *Subsurface and Physical Conditions*

A. *Reports and Drawings*: The Supplementary Conditions identify:

1. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site;

2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities); and

3. Technical Data contained in such reports and drawings.

B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

5.04 *Differing Subsurface or Physical Conditions*

A. *Notice by Contractor*: If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site either:

1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate; or

2. is of such a nature as to require a change in the Drawings or Specifications; or

3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

B. *Engineer's Review*: After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine the necessity of Owner's obtaining additional exploration or tests

with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A above; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.

C. *Owner's Statement to Contractor Regarding Site Condition*: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.

D. *Possible Price and Times Adjustments*:

1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, or both, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

    a. such condition must fall within any one or more of the categories described in Paragraph 5.04.A;

    b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,

    c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:

    a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise; or

    b. the existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or

c. Contractor failed to give the written notice as required by Paragraph 5.04.A.

3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.

4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

5.05 *Underground Facilities*

A. *Contractor's Responsibilities*: The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or adjacent to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. Owner and Engineer do not warrant or guarantee the accuracy or completeness of any such information or data provided by others; and

2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:

a. reviewing and checking all information and data regarding existing Underground Facilities at the Site;

b. locating all Underground Facilities shown or indicated in the Contract Documents as being at the Site;

c. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and

d. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.

B. *Notice by Contractor*: If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer.

C. *Engineer's Review*: Engineer will promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to

Owner regarding the Contractor's resumption of Work in connection with the Underground Facility in question; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and advise Owner in writing of Engineer's findings, conclusions, and recommendations. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

D. *Owner's Statement to Contractor Regarding Underground Facility*: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question, addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.

E. *Possible Price and Times Adjustments*:

1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, or both, to the extent that any existing Underground Facility at the Site that was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

    a. Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated the existence or actual location of the Underground Facility in question;

    b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;

    c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times; and

    d. Contractor gave the notice required in Paragraph 5.05.B.

2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.

3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

5.06 *Hazardous Environmental Conditions at Site*

A. *Reports and Drawings*: The Supplementary Conditions identify:

1. those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and

2. Technical Data contained in such reports and drawings.

B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.

C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.

D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.

E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly

thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.

F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.

G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off.

H. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.

I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.H shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or

arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 6 – BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of all of Contractor's obligations under the Contract. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the Supplementary Conditions, or other specific provisions of the Contract. Contractor shall also furnish such other bonds as are required by the Supplementary Conditions or other specific provisions of the Contract.

B. All bonds shall be in the form prescribed by the Contract except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (as amended and supplemented) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.

C. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds in the required amounts.

D. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state or jurisdiction where any part of the Project is located, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the bond and surety requirements above.

E. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.

F. Upon request, Owner shall provide a copy of the payment bond to any Subcontractor, Supplier, or other person or entity claiming to have furnished labor or materials used in the performance of the Work.

6.02 *Insurance—General Provisions*

A. Owner and Contractor shall obtain and maintain insurance as required in this Article and in the Supplementary Conditions.

B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.

C. Contractor shall deliver to Owner, with copies to each named insured and additional insured (as identified in this Article, in the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Contractor has obtained and is maintaining the policies, coverages, and endorsements required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

D. Owner shall deliver to Contractor, with copies to each named insured and additional insured (as identified in this Article, the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Owner has obtained and is maintaining the policies, coverages, and endorsements required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

E. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, shall not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.

F. If either party does not purchase or maintain all of the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.

G. If Contractor has failed to obtain and maintain required insurance, Owner may exclude the Contractor from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 16.

H. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price shall be adjusted accordingly.

I. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests.

J. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner and other individuals and entities in the Contract.

6.03 *Contractor's Insurance*

A. *Workers' Compensation*: Contractor shall purchase and maintain workers' compensation and employer's liability insurance for:

1. claims under workers' compensation, disability benefits, and other similar employee benefit acts.

2. United States Longshoreman and Harbor Workers' Compensation Act and Jones Act coverage (if applicable).

3. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees (by stop-gap endorsement in monopolist worker's compensation states).

4. Foreign voluntary worker compensation (if applicable).

B. *Commercial General Liability—Claims Covered*: Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against:

1. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees.

2. claims for damages insured by reasonably available personal injury liability coverage.

3. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.

C. *Commercial General Liability—Form and Content*: Contractor's commercial liability policy shall be written on a 1996 (or later) ISO commercial general liability form (occurrence form) and include the following coverages and endorsements:

1. Products and completed operations coverage:

    a. Such insurance shall be maintained for three years after final payment.

    b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.

2. Blanket contractual liability coverage, to the extent permitted by law, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.

3. Broad form property damage coverage.

4. Severability of interest.

5. Underground, explosion, and collapse coverage.

6. Personal injury coverage.

7. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together); or CG 20 10 07 04 and CG 20 37 07 04 (together); or their equivalent.

8. For design professional additional insureds, ISO Endorsement CG 20 32 07 04, "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.

D. *Automobile liability*: Contractor shall purchase and maintain automobile liability insurance against claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy shall be written on an occurrence basis.

E. *Umbrella or excess liability*: Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the paragraphs above. Subject to industry-standard exclusions, the coverage afforded shall follow form as to each and every one of the underlying policies.

F. *Contractor's pollution liability insurance*: Contractor shall purchase and maintain a policy covering third-party injury and property damage claims, including clean-up costs, as a result of pollution conditions arising from Contractor's operations and completed operations. This insurance shall be maintained for no less than three years after final completion.

G. *Additional insureds*: The Contractor's commercial general liability, automobile liability, umbrella or excess, and pollution liability policies shall include and list as additional insureds Owner and Engineer, and any individuals or entities identified in the

Supplementary Conditions; include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds; and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby (including as applicable those arising from both ongoing and completed operations) on a non-contributory basis. Contractor shall obtain all necessary endorsements to support these requirements.

H. *Contractor's professional liability insurance*: If Contractor will provide or furnish professional services under this Contract, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance shall provide protection against claims arising out of performance of professional design or related services, and caused by a negligent error, omission, or act for which the insured party is legally liable. It shall be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. If such professional design services are performed by a Subcontractor, and not by Contractor itself, then the requirements of this paragraph may be satisfied through the purchasing and maintenance of such insurance by such Subcontractor.

I. *General provisions*: The policies of insurance required by this Paragraph 6.03 shall:

1. include at least the specific coverages provided in this Article.

2. be written for not less than the limits of liability provided in this Article and in the Supplementary Conditions, or required by Laws or Regulations, whichever is greater.

3. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed, or renewal refused until at least 10 days prior written notice has been given to Contractor. Within three days of receipt of any such written notice, Contractor shall provide a copy of the notice to Owner, Engineer, and each other insured under the policy.

4. remain in effect at least until final payment (and longer if expressly required in this Article) and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract Documents.

5. be appropriate for the Work being performed and provide protection from claims that may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable.

J. The coverage requirements for specific policies of insurance must be met by such policies, and not by reference to excess or umbrella insurance provided in other policies.

6.04 *Owner's Liability Insurance*

A. In addition to the insurance required to be provided by Contractor under Paragraph 6.03, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.

B. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.

6.05 *Property Insurance*

A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the full insurable replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:

1. include the Owner and Contractor as named insureds, and all Subcontractors, and any individuals or entities required by the Supplementary Conditions to be insured under such builder's risk policy, as insureds or named insureds. For purposes of the remainder of this Paragraph 6.05, Paragraphs 6.06 and 6.07, and any corresponding Supplementary Conditions, the parties required to be insured shall collectively be referred to as "insureds."

2. be written on a builder's risk "all risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire; lightning; windstorm; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; flood; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; water damage (other than that caused by flood); and such other perils or causes of loss as may be specifically required by the Supplementary Conditions. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance may be provided through other insurance policies acceptable to Owner and Contractor.

3. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the

permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.

4. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects).

5. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier).

6. extend to cover damage or loss to insured property while in transit.

7. allow for partial occupation or use of the Work by Owner, such that those portions of the Work that are not yet occupied or used by Owner shall remain covered by the builder's risk insurance.

8. allow for the waiver of the insurer's subrogation rights, as set forth below.

9. provide primary coverage for all losses and damages caused by the perils or causes of loss covered.

10. not include a co-insurance clause.

11. include an exception for ensuing losses from physical damage or loss with respect to any defective workmanship, design, or materials exclusions.

12. include performance/hot testing and start-up.

13. be maintained in effect, subject to the provisions herein regarding Substantial Completion and partial occupancy or use of the Work by Owner, until the Work is complete.

B. *Notice of Cancellation or Change*: All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 6.05 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured.

C. *Deductibles*: The purchaser of any required builder's risk or property insurance shall pay for costs not covered because of the application of a policy deductible.

D. *Partial Occupancy or Use by Owner*: If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide notice of such occupancy or use to the builder's risk insurer. The

builder's risk insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy; rather, those portions of the Work that are occupied or used by Owner may come off the builder's risk policy, while those portions of the Work not yet occupied or used by Owner shall remain covered by the builder's risk insurance.

E. *Additional Insurance*: If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.05, it may do so at Contractor's expense.

F. *Insurance of Other Property*: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, such as tools, construction equipment, or other personal property owned by Contractor, a Subcontractor, or an employee of Contractor or a Subcontractor, then the entity or individual owning such property item will be responsible for deciding whether to insure it, and if so in what amount.

6.06 *Waiver of Rights*

A. All policies purchased in accordance with Paragraph 6.05, expressly including the builder's risk policy, shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all Subcontractors, all individuals or entities identified in the Supplementary Conditions as insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.

B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for:

1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and

2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during

partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06.

C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 6.06.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them.

D. Contractor shall be responsible for assuring that the agreement under which a Subcontractor performs a portion of the Work contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by builder's risk insurance and any other property insurance applicable to the Work.

6.07 *Receipt and Application of Property Insurance Proceeds*

A. Any insured loss under the builder's risk and other policies of insurance required by Paragraph 6.05 will be adjusted and settled with the named insured that purchased the policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.

B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.05 shall distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.

C. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the money so received applied on account thereof, and the Work and the cost thereof covered by Change Order, if needed.

ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES

7.01 *Supervision and Superintendence*

A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be

necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.

B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

7.02 *Labor; Working Hours*

A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.

B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

7.03 *Services, Materials, and Equipment*

A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.

B. All materials and equipment incorporated into the Work shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

7.04 *"Or Equals"*

A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is

followed by words reading that no like, equivalent, or "or equal" item is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment, or items from other proposed suppliers under the circumstances described below.

1. If Engineer in its sole discretion determines that an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer shall deem it an "or equal" item. For the purposes of this paragraph, a proposed item of material or equipment will be considered functionally equal to an item so named if:

    a. in the exercise of reasonable judgment Engineer determines that:

        1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

        2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;

        3) it has a proven record of performance and availability of responsive service; and

        4) it is not objectionable to Owner.

    b. Contractor certifies that, if approved and incorporated into the Work:

        1) there will be no increase in cost to the Owner or increase in Contract Times; and

        2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

B. *Contractor's Expense*: Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.

C. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal", which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.

D. *Effect of Engineer's Determination*: Neither approval nor denial of an "or-equal" request shall result in any change in Contract Price. The Engineer's denial of an "or-equal" request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents.

E. *Treatment as a Substitution Request*: If Engineer determines that an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer considered the proposed item as a substitute pursuant to Paragraph 7.05.

7.05 *Substitutes*

A. Unless the specification or description of an item of material or equipment required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment under the circumstances described below. To the extent possible such requests shall be made before commencement of related construction at the Site.

1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of material or equipment from anyone other than Contractor.

2. The requirements for review by Engineer will be as set forth in Paragraph 7.05.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.

3. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:

a. shall certify that the proposed substitute item will:

1) perform adequately the functions and achieve the results called for by the general design,

2) be similar in substance to that specified, and

3) be suited to the same use as that specified.

b. will state:

1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times,

2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and

3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.

c. will identify:

1) all variations of the proposed substitute item from that specified, and

2) available engineering, sales, maintenance, repair, and replacement services.

d. shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.

B. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.

C. *Special Guarantee*: Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

D. *Reimbursement of Engineer's Cost*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

E. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute at Contractor's expense.

F. *Effect of Engineer's Determination*: If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.05.D, by timely submittal of a Change Proposal.

7.06 *Concerning Subcontractors, Suppliers, and Others*

A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner.

B. Contractor shall retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of designated parts of the Work if required by the Contract to do so.

C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against which Contractor has reasonable objection.

D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable, during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within five days.

E. Owner may require the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors, Suppliers, or other individuals or entities for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor, Supplier, or other individual or entity so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity.

F. If Owner requires the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, or both, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.

G. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.

H. On a monthly basis Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.

I. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions.

J. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors, Suppliers, and all other individuals or entities performing or furnishing any of the Work.

K. Contractor shall restrict all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed herein.

L. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

M. All Work performed for Contractor by a Subcontractor or Supplier shall be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer.

N. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor on account of Work performed for Contractor by the particular Subcontractor or Supplier.

O. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier, or other individual or entity; nor

2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

7.07 *Patent Fees and Royalties*

A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.

B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising

out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.

C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

7.08 *Permits*

A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work

7.09 *Taxes*

A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

7.10 *Laws and Regulations*

A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It shall not be Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with

Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.

C. Owner or Contractor may give notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.11 *Record Documents*

A. Contractor shall maintain in a safe place at the Site one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved Shop Drawings. Contractor shall keep such record documents in good order and annotate them to show changes made during construction. These record documents, together with all approved Samples, will be available to Engineer for reference. Upon completion of the Work, Contractor shall deliver these record documents to Engineer.

7.12 *Safety and Protection*

A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:

1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify Owner; the owners of adjacent property, Underground Facilities, and other utilities; and other contractors and utility owners performing work at or adjacent to the Site, when prosecution of the Work may affect them, and shall cooperate

with them in the protection, removal, relocation, and replacement of their property or work in progress.

C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.

D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.

E. All damage, injury, or loss to any property referred to in Paragraph 7.12.A.2 or 7.12.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

F. Contractor's duties and responsibilities for safety and protection shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 15.06.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

G. Contractor's duties and responsibilities for safety and protection shall resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.13 *Safety Representative*

A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

7.14 *Hazard Communication Programs*

A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

7.15 *Emergencies*

A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened

damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

7.16 *Shop Drawings, Samples, and Other Submittals*

A. *Shop Drawing and Sample Submittal Requirements*:

1. Before submitting a Shop Drawing or Sample, Contractor shall have:

a. reviewed and coordinated the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;

b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

c. determined and verified the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and

d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.

2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that submittal, and that Contractor approves the submittal.

3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be set forth in a written communication separate from the Shop Drawings or Sample submittal; and, in addition, in the case of Shop Drawings by a specific notation made on each Shop Drawing submitted to Engineer for review and approval of each such variation.

B. *Submittal Procedures for Shop Drawings and Samples*: Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals. Each submittal will be identified as Engineer may require.

1. *Shop Drawings*:

a. Contractor shall submit the number of copies required in the Specifications.

b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.D.

2. *Samples*:

a. Contractor shall submit the number of Samples required in the Specifications.

b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 7.16.D.

3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. *Other Submittals*: Contractor shall submit other submittals to Engineer in accordance with the accepted Schedule of Submittals, and pursuant to the applicable terms of the Specifications.

D. *Engineer's Review*:

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs incident thereto.

3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

4. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will document any such approved variation from the requirements of the Contract Documents in a Field Order.

5. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 7.16.A and B.

6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, shall not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.

7. Neither Engineer's receipt, review, acceptance or approval of a Shop Drawing, Sample, or other submittal shall result in such item becoming a Contract Document.

8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.D.4.

E. *Resubmittal Procedures*:

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

2. Contractor shall furnish required submittals with sufficient information and accuracy to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing a fourth or subsequent submittal of a Shop Drawings, sample, or other item requiring approval, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges.

3. If Contractor requests a change of a previously approved submittal item, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

7.17 *Contractor's General Warranty and Guarantee*

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on Contractor's warranty and guarantee.

B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or

2. normal wear and tear under normal usage.

C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:

1. observations by Engineer;

2. recommendation by Engineer or payment by Owner of any progress or final payment;

3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;

4. use or occupancy of the Work or any part thereof by Owner;

5. any review and approval of a Shop Drawing or Sample submittal;

6. the issuance of a notice of acceptability by Engineer;

7. any inspection, test, or approval by others; or

8. any correction of defective Work by Owner.

D. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract shall govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

7.18 *Indemnification*

A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable.

B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee

(or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

C. The indemnification obligations of Contractor under Paragraph 7.18.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:

1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or

2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

7.19 *Delegation of Professional Design Services*

A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable Laws and Regulations.

B. If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.

D. Pursuant to this paragraph, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals

(except design calculations and design drawings) will be only for the purpose stated in Paragraph 7.16.D.1.

E. Contractor shall not be responsible for the adequacy of the performance or design criteria specified by Owner or Engineer.

ARTICLE 8 – OTHER WORK AT THE SITE

8.01 *Other Work*

A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.

B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any utility work at or adjacent to the Site, Owner shall provide such information to Contractor.

C. Contractor shall afford each other contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.

D. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 8, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

8.02 *Coordination*

A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site,

the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:

1. the identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;

2. an itemization of the specific matters to be covered by such authority and responsibility; and

3. the extent of such authority and responsibilities.

B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

8.03 *Legal Relationships*

A. If, in the course of performing other work at or adjacent to the Site for Owner, the Owner's employees, any other contractor working for Owner, or any utility owner causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment shall take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract. When applicable, any such equitable adjustment in Contract Price shall be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due to Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this paragraph.

C. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to

Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due to Contractor.

D. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

ARTICLE 9 – OWNER'S RESPONSIBILITIES

9.01 *Communications to Contractor*

A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

9.02 *Replacement of Engineer*

A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents shall be that of the former Engineer.

9.03 *Furnish Data*

A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

9.04 *Pay When Due*

A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

9.05 *Lands and Easements; Reports, Tests, and Drawings*

A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.

B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.

C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

9.06 *Insurance*

A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

9.07 *Change Orders*

A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.

9.08 *Inspections, Tests, and Approvals*

A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 *Limitations on Owner's Responsibilities*

A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

9.10 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 *Evidence of Financial Arrangements*

A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents (including obligations under proposed changes in the Work).

9.12 *Safety Programs*

A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.

B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 10 – ENGINEER'S STATUS DURING CONSTRUCTION

10.01 *Owner's Representative*

A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract.

10.02 *Visits to Site*

A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.08. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Project Representative*

A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 10.08. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent, or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

10.04 *Rejecting Defective Work*

A. Engineer has the authority to reject Work in accordance with Article 14.

10.05 *Shop Drawings, Change Orders and Payments*

A. Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, are set forth in Paragraph 7.16.

B. Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, are set forth in Paragraph 7.19.

C. Engineer's authority as to Change Orders is set forth in Article 11.

D. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.06 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

10.07 *Decisions on Requirements of Contract Documents and Acceptability of Work*

A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.08 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 15.06.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 10.08 shall also apply to the Resident Project Representative, if any.

10.09 *Compliance with Safety Program*

A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs (if any) of which Engineer has been informed.

ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK

11.01 *Amending and Supplementing Contract Documents*

A. The Contract Documents may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.

1. *Change Orders*:

a. If an amendment or supplement to the Contract Documents includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order. A Change Order also may be used to establish amendments and supplements of the Contract Documents that do not affect the Contract Price or Contract Times.

b. Owner and Contractor may amend those terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, without the recommendation of the Engineer. Such an amendment shall be set forth in a Change Order.

2. *Work Change Directives*: A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.04 regarding change of Contract Price. Contractor must submit any Change Proposal seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 30

days after the completion of the Work set out in the Work Change Directive. Owner must submit any Claim seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 60 days after issuance of the Work Change Directive.

3. *Field Orders*: Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.02 *Owner-Authorized Changes in the Work*

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Such changes shall be supported by Engineer's recommendation, to the extent the change involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters. Such changes may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work shall be performed under the applicable conditions of the Contract Documents. Nothing in this paragraph shall obligate Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.03 *Unauthorized Changes in the Work*

A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.

11.04 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment of Contract Price shall comply with the provisions of Article 12.

B. An adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03); or

2. where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.04.C.2); or

3. where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.04.C).

C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or

2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

a. for costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee shall be 15 percent;

b. for costs incurred under Paragraph 13.01.B.3, the Contractor's fee shall be five percent;

c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.01.C.2.a and 11.01.C.2.b is that the Contractor's fee shall be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.A.1 and 13.01.A.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of five percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted work the maximum total fee to be paid by Owner shall be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the work;

d. no fee shall be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;

e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net

decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and

f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 11.04.C.2.a through 11.04.C.2.e, inclusive.

11.05 *Change of Contract Times*

A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment in the Contract Times shall comply with the provisions of Article 12.

B. An adjustment of the Contract Times shall be subject to the limitations set forth in Paragraph 4.05, concerning delays in Contractor's progress.

11.06 *Change Proposals*

A. Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; appeal an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; contest a set-off against payment due; or seek other relief under the Contract. The Change Proposal shall specify any proposed change in Contract Times or Contract Price, or both, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents.

1. *Procedures*: Contractor shall submit each Change Proposal to Engineer promptly (but in no event later than 30 days) after the start of the event giving rise thereto, or after such initial decision. The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal. The supporting data shall be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event. Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal.

2. *Engineer's Action*: Engineer will review each Change Proposal and, within 30 days after receipt of the Contractor's supporting data, either deny the Change Proposal in whole, approve it in whole, or deny it in part and approve it in part. Such actions shall be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.

3. *Binding Decision*: Engineer's decision will be final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.

B. *Resolution of Certain Change Proposals*: If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice shall be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

11.07 *Execution of Change Orders*

A. Owner and Contractor shall execute appropriate Change Orders covering:

1. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;

2. changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;

3. changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.02, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters; and

4. changes in the Contract Price or Contract Times, or other changes, which embody the substance of any final and binding results under Paragraph 11.06, or Article 12.

B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of this Paragraph 11.07, it shall be deemed to be of full force and effect, as if fully executed.

11.08 *Notification to Surety*

A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

ARTICLE 12 – CLAIMS

12.01 *Claims*

A. *Claims Process*: The following disputes between Owner and Contractor shall be submitted to the Claims process set forth in this Article:

1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;

2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents; and

3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters.

B. *Submittal of Claim*: The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim shall rest with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, or both, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.

C. *Review and Resolution*: The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim shall be stated in writing and submitted to the other party, with a copy to Engineer.

D. *Mediation*:

1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate shall stay the Claim submittal and response process.

2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process shall resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim submittal and decision process shall resume as of the date of the conclusion of the mediation, as determined by the mediator.

3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.

E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action shall be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.

F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim shall be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.

G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim shall be incorporated in a Change Order to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

ARTICLE 13 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

13.01 *Cost of the Work*

A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:

1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or

2. To determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.

B. *Costs Included*: Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 13.01.C, and shall include only the following items:

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for

employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, and vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.

5. Supplemental costs including the following:

    a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.

    b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

    c. Rentals of all construction equipment and machinery, and the parts thereof, whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements.

The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.

e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 6.05), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

g. The cost of utilities, fuel, and sanitary facilities at the Site.

h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.

i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.

C. *Costs Excluded*: The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.

2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.

3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.

4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee*: When the Work as a whole is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 11.04.C.

E. *Documentation*: Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

13.02 *Allowances*

A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

B. *Cash Allowances*: Contractor agrees that:

1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

C. *Contingency Allowance*: Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

13.03 *Unit Price Work*

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an

amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.

C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of the following paragraph.

E. Within 30 days of Engineer's written decision under the preceding paragraph, Contractor may submit a Change Proposal, or Owner may file a Claim, seeking an adjustment in the Contract Price if:

1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement;

2. there is no corresponding adjustment with respect to any other item of Work; and

3. Contractor believes that it is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price, and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 14 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

14.01 *Access to Work*

A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

14.02 *Tests, Inspections, and Approvals*

A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.

B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work shall be governed by the provisions of Paragraph 14.05.

C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:

1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;

2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;

3. by manufacturers of equipment furnished under the Contract Documents;

4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and

5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests shall be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.

F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering shall be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 *Defective Work*

A. *Contractor's Obligation*: It is Contractor's obligation to assure that the Work is not defective.

B. *Engineer's Authority*: Engineer has the authority to determine whether Work is defective, and to reject defective Work.

C. *Notice of Defects*: Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.

D. *Correction, or Removal and Replacement*: Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.

E. *Preservation of Warranties*: When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

F. *Costs and Damages*: In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work shall be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 *Uncovering Work*

A. Engineer has the authority to require special inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.

B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.

C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.

1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.

2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *Owner May Stop the Work*

A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

14.07 *Owner May Correct Defective Work*

A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, then

Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.

C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

15.01 *Progress Payments*

A. *Basis for Progress Payments*: The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.

B. *Applications for Payments*:

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens, and evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or

other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

C. *Review of Applications*:

1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.

2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

   a. the Work has progressed to the point indicated;

   b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and

   c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.

3. By recommending any such payment Engineer will not thereby be deemed to have represented that:

   a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or

b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:

   a. to supervise, direct, or control the Work, or

   b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or

   c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or

   d. to make any examination to ascertain how or for what purposes Contractor has used the money paid on account of the Contract Price, or

   e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.

5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.

6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:

   a. the Work is defective, requiring correction or replacement;

   b. the Contract Price has been reduced by Change Orders;

   c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;

   d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or

   e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due*:

1. Thirty (30) days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

E. *Reductions in Payment by Owner*:

1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:

   a. claims have been made against Owner on account of Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages on account of Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;

   b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;

   c. Contractor has failed to provide and maintain required bonds or insurance;

   d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;

   e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;

   f. the Work is defective, requiring correction or replacement;

   g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;

   h. the Contract Price has been reduced by Change Orders;

   i. an event that would constitute a default by Contractor and therefore justify a termination for cause has occurred;

   j. liquidated damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;

   k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;

   l. there are other items entitling Owner to a set off against the amount recommended.

2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any

amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed shall be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 15.01.C.1 and subject to interest as provided in the Agreement.

15.02 *Contractor's Warranty of Title*

A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than seven days after the time of payment by Owner.

15.03 *Substantial Completion*

A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.

B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.

C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which shall fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.

D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.

E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.

F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

15.04 *Partial Use or Occupancy*

A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:

1. At any time Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through E for that part of the Work.

2. At any time Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.05 regarding builder's risk or other property insurance.

15.05 *Final Inspection*

A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

15.06 *Final Payment*

A. *Application for Payment*:

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, annotated record documents (as provided in Paragraph 7.11), and other documents, Contractor may make application for final payment.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:

a. all documentation called for in the Contract Documents;

b. consent of the surety, if any, to final payment;

c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.

d. a list of all disputes that Contractor believes are unsettled; and

e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner

against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.

B. *Engineer's Review of Application and Acceptance*:

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the Application for Payment to Owner for payment. Such recommendation shall account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to the provisions of Paragraph 15.07. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. *Completion of Work*: The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment.

D. *Payment Becomes Due*: Thirty days after the presentation to Owner of the final Application for Payment and accompanying documentation, the amount recommended by Engineer (less any further sum Owner is entitled to set off against Engineer's recommendation, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions above with respect to progress payments) will become due and shall be paid by Owner to Contractor.

15.07 *Waiver of Claims*

A. The making of final payment will not constitute a waiver by Owner of claims or rights against Contractor. Owner expressly reserves claims and rights arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 15.05, from Contractor's failure to comply with the Contract Documents or the terms of any special guarantees specified therein, from outstanding Claims by Owner, or from Contractor's continuing obligations under the Contract Documents.

B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted or appealed under the provisions of Article 17.

15.08 *Correction Period*

A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents, or by any specific provision of the Contract Documents), any Work is found to be defective, or if the repair of any damages to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas used by Contractor as permitted by Laws and Regulations, is found to be defective, then Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. correct the defective repairs to the Site or such other adjacent areas;

2. correct such defective Work;

3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and

4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting therefrom.

B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others).

C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.

D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

E. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION

16.01 *Owner May Suspend Work*

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension. Any Change Proposal seeking such adjustments shall be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule);

2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;

3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or

4. Contractor's repeated disregard of the authority of Owner or Engineer.

B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) ten days written notice that Owner is considering a declaration that Contractor is in default and termination of the contract, Owner may proceed to:

1. declare Contractor to be in default, and give Contractor (and any surety) notice that the Contract is terminated; and

2. enforce the rights available to Owner under any applicable performance bond.

C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.

D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within seven days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.

E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.

G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond shall govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate For Convenience*

A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):

1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and

3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.

B. Contractor shall not be paid on account of loss of anticipated overhead, profits, or revenue, or other economic loss arising out of or resulting from such termination.

16.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted,

or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.

B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

ARTICLE 17 – FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

A. *Disputes Subject to Final Resolution*: The following disputed matters are subject to final resolution under the provisions of this Article:

1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full; and

2. Disputes between Owner and Contractor concerning the Work or obligations under the Contract Documents, and arising after final payment has been made.

B. *Final Resolution of Disputes*: For any dispute subject to resolution under this Article, Owner or Contractor may:

1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions; or

2. agree with the other party to submit the dispute to another dispute resolution process; or

3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18 – MISCELLANEOUS

18.01 *Giving Notice*

A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:

1. delivered in person, by a commercial courier service or otherwise, to the individual or to a member of the firm or to an officer of the corporation for which it is intended; or

2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the sender of the notice.

18.02 *Computation of Times*

A. When any period of time is referred to in the Contract by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

18.03 *Cumulative Remedies*

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

18.04 *Limitation of Damages*

A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

A. A party's non-enforcement of any provision shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

18.07 *Controlling Law*

A. This Contract is to be governed by the law of the state in which the Project is located.

18.08 *Headings*

A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

END OF SECTION

SECTION 00 73 00
SUPPLEMENTAL CONDITIONS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. This section describes the supplemental conditions of the project and contract agreement. The conditions in this Section are specific administrative and policy requirements in addition to the general conditions and other requirements listed in the contract documents.

1.2 INDEMNIFICATION

A. The Contractor agrees to indemnify and to hold the Owner and the (Architect or Engineer) harmless from and against any and all damages, claims, demands, suits, judgments and costs including attorney's fees and expenses for or on account of damage to property of any person, firm corporation, or Government agency, or death of or injury to any person or persons (including property and employees of the Owner, the Contractor, and employees of the Contractor) directly or indirectly arising out of, or caused by or in connection with the performance of or failure to perform any work provided for hereunder by the Contractor, his subcontractors, or their or the Contractor's agents, servants, or employees.

B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, Engineer, Engineer’s Consultants and the officers, directors, partners, employees, agents, other consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Section shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual’s or entity’s own negligence.

C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner, (Architect or Engineer), (Architect's or Engineer’s) Consultants, and the officers, directors, partners, employees, agents, other consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this paragraph shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual’s or entity’s own negligence.

1.3 INSURANCE

A. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance this Section and the Contract Documents, shall contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner, Construction Manager and Contractor and to each other additional insured to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with this Section and the Contract Documents.

B. The Contractor will shall require the subcontractors to provide to the Owner all the below insurance limits by the use of a certificate of insurance.

C. The Contractor shall not commence work under this contract until he has obtained all the insurance required under this paragraph and such insurance has been approved by the Owner.

1. Worker's Compensation Insurance: The Contractor shall procure and shall maintain during the life of this Contract, Worker's Compensation Insurance as required by the State of Texas for all of employees to be engaged in work at the site of the project under this contract and, in case of any such work sublet, the Contractor shall require the subcontractor similarly to provide Worker's Compensation Insurance for all employees to be engaged in such work unless such employees are covered by the protection afforded by the Contractor's Worker's Compensation Insurance.
2. Contractor's Public Liability and Property Damage Insurance and Vehicle Liability Insurance: The Contractor shall procure and shall maintain during the life of this contract Contractor's Public Liability Insurance, Contractor's Property Damage Insurance and Vehicle Liability Insurance in the following amounts shown in Insurance Limits in Paragraph 1.06 below.

D. Proof of Insurance: The Contractor and Subcontractors shall furnish the Owner with certificates showing the type, amount, class of operations covered, effective dates and date of expiration of policies. Such certificates shall also contain substantially the following statement: "The insurance covered by this certificate will not be canceled or materially altered, except after ten (10) days written notice has been received by the Owner."

1.4 INSURANCE LIMITS

A. The Contractor and Subcontractors, at his expense, shall take out and keep in force throughout the term of this Contract, the following insurance coverage in the amounts specified below to cover all of his operations in connection with the work to be performed under the Technical Specifications. The insurance certificates shall be submitted to the Owner for acceptance prior to move in and beginning work.

MINIMUM INSURANCE REQUIREMENTS

INSURANCE TYPE	LIMITS OF LIABILITY
A. Workman's Compensation	$1,000,000 per occurrence
B. General Liability Comprehensive Form Premises - Operations Products/Completed Operations Hazard Contractual Insurance Independent Contractors Personal Injury	$1,000,000
C. Automobile Liability Comprehensive Owned Hired Non-owned	$1,000,000
D. Excess Liability Umbrella Form	$1,000,000
E. Property Damage	$1,000,000

B. The remaining term of all policies shall extend at least to the completion date of this Contract; if the expiration date shall occur prior to final completion of all operations hereunder, Contractor shall, not less than fifteen (15) days prior to expiration date, furnish evidence of renewal of or extension of such insurance. All such evidence of insurance shall provide for ten (10) days prior notice to be given to Owner in the event of cancellation.

1.5 EQUAL EMPLOYMENT OPPORTUNITY AND AFFIRMATIVE ACTION PROGRAM

A. Equal Employment Opportunity
   1. The Contractor will not discriminate against any employee or the applicant for employment because of race, color, religion, sex, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to the following: employment, promotion, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the owner.
   2. The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin.
   3. The Contractor will cause the foregoing provisions to be inserted in all subcontracts for any work covered by this contract so that such provisions will be binding upon each subcontractor, provided that the foregoing provisions shall not apply to contracts or subcontracts for standard commercial supplies or raw materials.
   4. The Contractor shall take affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions.
   5. Contractors are encouraged to participate in voluntary associations which assist in fulfilling their affirmative action obligations.
   6. A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority.
   7. The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.
   8. The Contractor shall not enter into any Subcontract with any person or firm debarred from Government contracts.
   9. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents.

B. Affirmative Action for Handicapped Workers
   1. The Contractor will not discriminate against any employee or applicant for employment because of physical or mental handicap in regard to any position for which the employee or applicant for employment is qualified. The Contractor agrees to take affirmative action to employ, advance in employment and otherwise treat qualified handicapped individuals without discrimination based upon their physical or mental handicap in all employment practices such as the following: employment, promotion, demotion or transfer, recruitment, advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship.

C. Non-Segregated Facilities
   1. The Contractor certifies that he does not and will not maintain or provide for his employees any segregated facilities at any of his establishments, and that he does not and will not permit his employees any segregated facilities at any of his establishments, or permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. As used in this paragraph the term "segregated facilities" means any waiting rooms, work areas, rest rooms and washrooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, creed, color, or national origin, because of habit, local custom, or otherwise.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

SECTION 00 90 00
MODIFICATIONS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. This section contains information pertaining to modifications and changes of the Contract Documents for the Project.

1.2 MODIFICATION OF CONTRACT DOCUMENTS

A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof in one or more of the following ways: (i) a Written Amendment; (ii) a Change Order; or (iii) a Work Change Directive.

B. The requirements of the Contract Documents may be supplemented and minor variations and deviations in the Work may be authorized, by one or more of the following ways: (i) a Field Order; (ii) Engineer's approval of a Shop Drawing or Sample; or (iii) Engineer's written interpretation or clarification.

C. Contractor and any Subcontractor or Supplier or other individual or entity performing or furnishing any of the Work under a direct or indirect contract with Owner: (i) shall not have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or Engineer's Consultant, including electronic media editions; and (ii) shall not reuse any of such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adoption by Engineer. This prohibition will survive final payment, completion, and acceptance of the Work, or termination or completion of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

SECTION 00 92 00
SPECIAL CONDITIONS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. This section contains information pertaining to special conditions for the Project.

1.2 SC1-COMMUNICATION PROTOCOL

A. All communication from the Owner to the Contractor shall be through the Contractor's Project Manager and/or Superintendent. Communication to/from the Contractor's subcontractors shall be routed to the Owner through the Contractor. Contact information for the Owner and the Contractor will be provided at the pre-construction conference.

1.3 SC2-CONSTRUCTION PHASING AND SEQUENCING

A. The Contractor may follow the proposed construction sequencing in the Contract Documents. If the Contractor does not plan to follow the construction sequence included in the Contract Documents, the Contractor shall submit the proposed alternative sequence of construction in writing to the Owner and the Consultant for review and approval. It is the Contractor's responsibility to provide sufficient work force, materials, and equipment to complete the work in accordance with the Contract duration.

B. The City of Alamo Water Treatment Plant (WTP) cannot be taken offline to complete the Work.

1.4 SC3-RESIDENTIAL AREAS

A. The City of Alamo WTP is located within a residential neighborhood and adjacent to a school. Work and work hours shall be mindful of noise to minimize nuisance to nearby residents.

1.5 SC4-WASTEWATER TREATMENT OPERATION

A. The City of Alamo WTP is a critical water treatment facility for the Owner. The Contractor shall provide site access to the Owner as needed to operate and maintain these facilities.

1.6 SC5-SAFETY

A. Following are the safety conditions for the Contractor to comply with:
   1. The Contractor shall implement safety measures and take precautions to provide a safe work environment. At a minimum, the safety measures and precautions shall be in compliance with City, County, State and Federal requirements.
   2. The Contractor shall have at least one person with them at all times that have attended Contractor Safety training.
   3. The Contractor shall submit a copy of their Safety Plan for review and approval before the work commences.

1.7 SC6-SITE RESTORATION

A. The Contractor shall be responsible for protecting existing features during construction. Any features damaged shall be repaired or replaced at no additional cost to the Owner to the owner's satisfaction. The Contractor is responsible for restoration of all disturbed areas within the limits of construction and existing easements.

1.8 SC9-COORDINATION WITH ON-SITE PERSONNEL

A. The Contractor agrees to cooperate and coordinate its work with the work conducted by other supplier(s)/contractor(s) and/or City of Alamo Operations staff within the project area so that this project can be completed in an orderly and coordinated manner, reasonably free of significant disruption to any party. Without limitation of the foregoing, the Contractor understands and agrees that access areas to the project site may be utilized by other supplier(s)/contractor(s). All parties shall be solely required and obligated to coordinate and cooperate with each other to accomplish the scope of work required by their respective contracts, meaning Owner shall have no duty to administer, perform or supervise the coordination for the use of the project site by all suppliers/contractors. The Contractor agrees that any delay or hindrance caused by or contributed to by failure to cooperate and/or coordinate among all parties will be governed by this Section, Security Procedures and General Conditions of the Contract Documents.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

TECHNICAL
SPECIFICATIONS

SECTION 01 11 00
SUMMARY OF WORK

PART 1 - GENERAL

1.1 LOCATION

A. The work is located at the City of Alamo Water Treatment Plant at 800 South Alamo Rd..

1.2 DESCRIPTION OF THE WORK

A. The work to be performed under this contract includes but is not limited to constructing the Work described below and all related appurtenances:
   1. Mechanical Repair to Clarifier No. 1
   2. Mechanical Repair to Clarifier No. 2
   3. Protective coating to Clarifier No. 1.

B. Contracting Method: Project will be constructed under one prime Contract.

1.3 WORK BY OWNER

A. OWNER will perform the following in connection with the work:
   1. Operate all existing valves, gates, pumps, equipment, and appurtenances that will affect OWNER's operation, unless otherwise specified or indicted.
   2. The OWNER will continue to use the existing facilities during the Project and the OWNER will conduct operational and maintenance work items to maintain existing system operations.

1.4 WORK BY OTHERS

A. Not Applicable.

1.5 SEQUENCE AND PROGRESS OF WORK

A. Requirements for sequencing and coordinating with OWNER's Operations, including maintenance of facility operations during construction, and requirements for tie-ins and shutdown. Contractor shall abide by the following:
   1. Only one (1) Clarifier is allowed to be out of service at any one time.
   2. Contractor is not allowed to initiate work related to the second clarifier is complete and back in service.
   3. Clarifier must be in service for at least two (2) weeks to demonstrate reliable operation prior to initiating work on the second clarifier.
   4. All work shall be completed during the City's low demand period, November 15, 2025 to April 15, 2025.

1.6 CONTRACTOR USE OF PREMISES

A. CONTRACTOR shall limit his use of the Site to the areas shown on the Plans by the limits of construction. If CONTRACTOR needs to access additional areas not outlined in the limits of construction, a written request notice shall be provided to OWNER and ENGINEER.

B. Assume full responsibility for the protection and safekeeping of products under this Contract, stored on the site.

C. Move stored materials and equipment that interfere with operations of OWNER, other contractors, and other performing work for OWNER.

D. Limits on CONTRACTOR'S use of the Sites are:
   1. OWNER shall have access to existing facilities, including but not limited to the entire water treatment plant at all times during construction.

1.7 SALVAGE OF MATERIALS AND EQUIPMENT AND EQUIPMENT

A. Existing materials and equipment removed and not shown or specified to be reused in the Work will become CONTRACTOR's property. OWNER has the right of first refusal on any item shown to be demolished/removed/replaced. CONTRACTOR to request clarification on items for salvage prior to starting demolition.

B. Existing materials and equipment removed by CONTRACTOR shall not be reused in the Work, except where so specified or indicated.

C. Removal, Storage, Handling, Reinstallation:
   1. Carefully remove in manner to prevent damage all materials and equipment shown or indicated to be salvaged and reused or to remain property of OWNER.
   2. Store and protect salvaged items shown or indicated to be used in the Work.
   3. Replace in-kind or with new items those items of materials and equipment.
   4. damaged during removal, storage, or handling through CONTRACTOR's actions, negligence, or improper procedures.

D. CONTRACTOR may furnish and install new items, with ENGINEER's approval, instead of those specified or indicated to be salvaged and reused, in which case such removed items will become CONTRACTOR's property.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

SECTION 01 22 13
MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 SCOPE SUMMARY

A. Procedures for measurement and payment plus conditions for nonconformance assessment and non-payment for rejected products.

1.2 AUTHORITY

A. Measurement methods delineated in Specification sections are intended to complement the criteria of this section. In the event of conflict, the requirements of the Specification section shall govern.

1.3 UNIT QUANTITIES SPECIFIED

A. **NO ADDITIONAL PAY SHALL BE PROVIDED IF THE ACTUAL WORK REQUIRED IS GREATER THAN THOSE INDICATED IN THE BID FORM. IF NO BID ITEM IS PROVIDED FOR WORK SHOWN ON THE DRAWINGS, IT SHALL BE CONSIDERED INCIDENTAL TO ONE OF THE OTHER BID ITEMS**.

1.4 ADMINISTRATIVE SUBMITTALS

A. Schedule of Values.

B. Schedule of Estimated Progress Payments:
   1. Submit with initially acceptable schedule of values.
   2. Submit adjustments thereto with Application for Payment.

C. Application for Payment.

D. Final Application for Payment.

1.5 SCHEDULE OF VALUES

A. Prepare a separate schedule of values for each schedule of Work under the Agreement.

B. Unit Price Work: Reflect unit price quantity and price breakdown from conformed Bid Form.

C. An unbalanced or front-end loaded schedule will not be acceptable.

D. Summation of the complete schedule of values representing all Work shall equal the Contract Price.

E. Refer to Section 01 29 73, SCHEDULE OF VALUES.

1.6 PROGRESS PAYMENTS

A. Scope:
   1. CONTRACTOR’s requests for payment shall be in accordance with the Agreement, General Conditions and Supplementary Conditions, and the Specifications.
   2. Form: Applications for Payment shall be in the form of Engineers Joint Contract Documents Committee (EJCDC) document EJCDC® C-620, “Contractor’s Application for Payment”, 2013 edition or later.

B. Procedure:
   1. Review with OWNER’S Inspections/Field Engineer quantities and the Work proposed for inclusion in each progress payment. Application for Payment shall cover only the Work and quantities recommended by the OWNER Inspections/Field Engineer.

2. CONTRACTOR will be required to review with ENGINEER or OWNER Inspections/Field Engineer the status of record documents in connection with OWNERS's review of each Application for Payment. Failure to maintain record document current will be just cause for ENGINEER to recommend a reduction in payment for record documents in accordance with Section 01 29 73, SCHEDULE OF VALUES, and will entitle OWNER to setoffs in accordance with the Contract Documents.
3. ENGINEER will act on request for payment in accordance with the General Conditions and Supplementary Conditions.

C. Each request for progress payment shall include:
1. Completed Application for Payment form, including summary/signature page, progress estimate sheets, and stored materials summary. Progress estimate sheets shall have the same level of detail as the Schedule of Values.
2. Documentation for Stored Materials and Equipment:
   a. For materials and equipment not incorporated in the Work but suitably stored, submit documentation in accordance with the General Conditions and Supplementary Conditions.
   b. Legibly indicate on invoice or bill of sale the specific materials or equipment included in the payment request and corresponding bid/payment item number for each.
3. Listing of Subcontractors and Suppliers:
   a. In accordance with the General Conditions, submit not less than monthly updated listing of all Subcontractors and Suppliers known to CONTRACTOR, whether or not such entities have a contract directly with CONTRACTOR.
   b. Submit complete information using the form attached to this Section.
4. Record drawings redlines.

D. Final Payment:
1. Requirements for request for final payment are in the General Conditions, as may be modified by the Supplementary Conditions.

1.7 PAYMENT FOR STORED MATERIALS AND EQUIPMENT

A. Observation of Stored Materials and Equipment Prior to Application for Payment:
1. General:
   a. Prior to materials or equipment suitably stored but not yet incorporated into the Work can be eligible for payment, ENGINEER or SAWS Inspector shall visit the storage location and verify the extent, condition, and storage environment of the stored items.
   b. When the same material or equipment item is stored for more than two months, such visits to storage location shall be not less than once every two months.
2. Cost Responsibility for Observations:
   a. When storage location is less than 20 miles from the Site or less than 20 miles from ENGINEER's office, CONTRACTOR is not responsible for reimbursing OWNER for cost of ENGINEER's time and expenses for observing stored materials and equipment.

1.8 MEASUREMENT – GENERAL

A. Weighing, measuring, and metering devices used to measure quantity of materials for Work shall be suitable for purpose intended and conform to tolerances and specifications as specified in National Institute of Standards and Technology, Handbook 44.

B. Whenever pay quantities of material are determined by weight, the material shall be weighed on scales furnished by CONTRACTOR and certified accurate by the state agency responsible. A weight or load slip shall be obtained from the weigher and delivered to the OWNER's representative at the point of delivery of the material.

C. If material is shipped by rail, the car weights will be accepted provided that actual weight of material only will be paid for and not minimum car weight used for assessing freight tariff, and provided further that car weights will not be acceptable for material to be passed through mixing plants.

D. Vehicles used to haul material being paid for by weight shall be weighed empty daily and at such additional times as required by ENGINEER. Each vehicle shall bear a plainly legible identification mark.

E. All materials which are specified for measurement by the cubic yard measured in the vehicle shall be hauled in vehicles of such type and size that the actual contents may be readily and accurately determined. Unless all vehicles are of uniform capacity, each vehicle must bear a plainly legible identification mark indicating its water level capacity. All vehicles shall be loaded to at least their water level capacity. Loads hauled in vehicles not meeting the above requirements or loads of a quantity less than the capacity of the vehicle, measured after being leveled off as above provided, will be subject to rejection, and no compensation will be allowed for such material.

F. Quantities will be based on ground profiles shown.

G. Where measurement of quantities depends on elevation of existing ground, elevations obtained during construction will be compared with those shown on Drawings. Variations of 1 foot or less will be ignored, and profiles shown on Drawings will be used for determining quantities.

H. Units of measure shown on the Bid Form shall be as follows unless specified otherwise.

Item	Method of Measurement
AC	Acre—Field Measure by ENGINEER
CY	Cubic Yard—Field Measure by ENGINEER within the limits specified or shown
CY-VM	Cubic Yard—Measured in the Vehicle by Volume
EA	Each—Field Count by ENGINEER
GAL	Gallon—Field Measure by ENGINEER
HR	Hour
LB	Pound(s)—Weight Measure by Scale
LF	Linear Foot—Field Measure by ENGINEER
LS	Lump Sum—Unit is one; no measurement will be made
SF	Square Foot
SY	Square Yard
TON	TON Ton—Weight Measure by Scale (2,000 pounds)

1.9 PAYMENT

A. Payment for lump sum work covers all Work necessary to furnish and install the following items.

Item No.	Description
CLARIFIER NO. 1	
1	**CLARI CONE® CLARIFIER NO. 1 (INTERIOR COATING):** **Measurement:** This item includes all costs for the interior coating of the ClariCone®. It shall include, but is not limited to installation and all labor material, tools, submittals, and incidentals required to perform the work in accordance with the contract documents, complete for the lump sum price. **Payment:** Lump sum payment for Item 1 will be full compensation for completing the Work, as shown on the Contract Documents or indicated under Division 01 through Division 46.
2	**CLARI CONE® CLARIFIER NO. 1 (EXTERIOR COATING):** **Measurement:** This item includes all costs for the exterior coating of the Clari Cone®. It shall include, but is not limited to installation and all labor material, tools, submittals, and incidentals required to perform the work in accordance with the contract documents, complete for the lump sum price. **Payment:** Unit price payment on a SF basis for Item 2 will be full compensation for completing the Work, as shown on the Contract Documents or indicated under Division 01 through Division 46.
3	**CLARI CONE® CLARIFIER NO. 1 (WALKWAY BRIDGE COATING):** This item includes all costs for the clarifier walkway bridge coating. It shall include, but is not limited to installation and all labor material, tools, submittals, and incidentals required to perform the work in accordance with the contract documents, complete for the lump sum price.

Item No.	Description
	Payment: Lump sum payment for Item 3 will be full compensation for completing the Work, as shown on the Contract Documents or indicated under Division 01 through Division 46.
4	**SLURRY CONCENTRATOR AIR RELEASE AND LEVEL GUIDE REPLACEMENT:** **Measurement:** This item includes all costs for the removal and replacement of the slurry concentrator air release and level guide. It shall include, but is not limited to the demolition, equipment, installation, startup/commissioning, manufacturer's services, and all labor material, tools, equipment submittals, and incidentals required to perform the work in accordance with the contract documents, complete for lump sum price. **Payment:** Unit price payment for Item 4 will be full compensation for completing the Work, as shown on the Contract Documents or indicated under Division 01 through Division 46.
5	**SLURRY CONCENTRATOR SUPPORT ASSEMBLY REPLACEMENT:** **Measurement:** This item includes all costs for the removal and replacement of the slurry concentrator support assembly. It shall include, but is not limited to the demolition, equipment, installation, startup/commissioning, manufacturer's services, and all labor material, tools, equipment submittals, and incidentals required to perform the work in accordance with the contract documents, complete for lump sum price. **Payment:** Unit price payment for Item 5 will be full compensation for completing the Work, as shown on the Contract Documents or indicated under Division 01 through Division 46.
6	**SAMPLING COUPLING REPLACEMENT:** **Measurement:** This item includes all costs for the removal and replacement of the sampling coupling assembly. It shall include, but is not limited to the demolition, equipment, installation, startup/commissioning, manufacturer's services, and all labor material, tools, equipment submittals, and incidentals required to perform the work in accordance with the contract documents, complete for lump sum price. **Payment:** Unit price **p**ayment for Item 6 will be full compensation for completing the Work, as shown on the Contract Documents or indicated under Division 01 through Division 46.
7	**CONCENTRATOR LIFT TUBE AND ACTUATOR ASSEMBLY:** **Measurement:** This item includes all costs for the removal and replacement of the concentrator lift tube and actuator assembly. It shall include, but is not limited to the demolition, equipment, installation, startup/commissioning, manufacturer's services, and all labor material, tools, equipment submittals, and incidentals required to perform the work in accordance with the contract documents, complete for lump sum price. **Payment:** Unit price **p**ayment for Item 7 will be full compensation for completing the Work, as shown on the Contract Documents or indicated under Division 01 through Division 46.
8	**RADIAL TROUGH OPERATOR ASSEMBLY:** **Measurement:** This item includes all costs for the removal and replacement of the radial trough operator assembly. It shall include, but is not limited to the demolition, equipment, installation, startup/commissioning, manufacturer's services, and all labor material, tools, equipment submittals, and incidentals required to perform the work in accordance with the contract documents, complete for lump sum price. **Payment:** Unit price **p**ayment for Item 8 will be full compensation for completing the Work, as shown on the Contract Documents or indicated under Division 01 through Division 46.
9	**REMOVE AND DISPOSE OF SLUDGE:** **Measurement:** This item includes all costs for the removal and disposal of sludge remaining in the clarifier after basin is dewatered by the owner. It shall include, but is not limited to all labor material, tools, submittals, and incidentals required to perform the work in accordance with the contract documents, complete for the unit price.

Item No.	Description
	Payment: Unit price payment on a TON basis for Item 9 will be full compensation for completing the Work, as shown on the Contract Documents or indicated under Division 01 through Division 46. Contractor must submit proof to confirm the volume of sludge removed and disposed of on-site at the exiting sludge holding pond.
CLARIFIER NO. 2	
10	**SLURRY CONCENTRATOR AIR RELEASE AND LEVEL GUIDE REPLACEMENT:** **Measurement:** This item includes all costs for the removal and replacement of the slurry concentrator air release and level guide. It shall include, but is not limited to the demolition, equipment, installation, startup/commissioning, manufacturer's services, and all labor material, tools, equipment submittals, and incidentals required to perform the work in accordance with the contract documents, complete for lump sum price. **Payment:** Unit price payment for Item 10 will be full compensation for completing the Work, as shown on the Contract Documents or indicated under Division 01 through Division 46.
11	**SLURRY CONCENTRATOR SUPPORT ASSEMBLY REPLACEMENT:** **Measurement:** This item includes all costs for the removal and replacement of the slurry concentrator support assembly. It shall include, but is not limited to the demolition, equipment, installation, startup/commissioning, manufacturer's services, and all labor material, tools, equipment submittals, and incidentals required to perform the work in accordance with the contract documents, complete for lump sum price. **Payment:** Unit price payment for Item 11 will be full compensation for completing the Work, as shown on the Contract Documents or indicated under Division 01 through Division 46.
12	**SAMPLING COUPLING REPLACEMENT:** **Measurement:** This item includes all costs for the removal and replacement of the sampling coupling assembly. It shall include, but is not limited to the demolition, equipment, installation, startup/commissioning, manufacturer's services, and all labor material, tools, equipment submittals, and incidentals required to perform the work in accordance with the contract documents, complete for lump sum price. **Payment:** Unit price **p**ayment for Item 12 will be full compensation for completing the Work, as shown on the Contract Documents or indicated under Division 01 through Division 46.
13	**REMOVE AND DISPOSE OF SLUDGE:** **Measurement:** This item includes all costs for the removal and disposal of sludge remaining in the clarifier after basin is dewatered by the owner. It shall include, but is not limited to all labor material, tools, submittals, and incidentals required to perform the work in accordance with the contract documents, complete for the unit price. **Payment:** Unit price payment on a TON basis for Item 13 will be full compensation for completing the Work, as shown on the Contract Documents or indicated under Division 01 through Division 46. Contractor must submit manifest documents to confirm payment on per TON basis for the removal and disposal of sludge.

B. Allowance

Item No.	Description
14	**REPAIR EFFLUENT WEIR TROUGH ALLOWANCE (CLARIFIER NO. 2)**: **Measurement:** Allowance for $25,000 for unforeseen repairs that may be required to the effluent weir trough. This shall include furnishing all labor, tools, equipment, and incidentals required to repair the items, and to be negotiated under the contract terms and conditions for complete in place.

Item No.	Description
	Payment: Contractor to pay and be reimbursed actual amount by OWNER.

C. Mobilization and Demobilization

Item No.	Description
15	**MOBILIZATION AND DEMOBILIZATION, MAX 6% OF LINE ITEMS 1 -13**: **Measurement:** This item shall include project move-in and move-out of personnel and equipment, for all work including furnishing all labor, materials, tools, equipment and incidentals required to mobilize, demobilize, clean site upon project completion, and bond and ensure the Work for the Project, in accordance with the Contract Documents, complete in place. Maximum of 6% of the total of Line Items 1 through 13. **Payment:** Lump sum payment for Item 15 will be full compensation for completing the Work, as shown on the Contract Documents or indicated under Division 01 through Division 46.
16	**INTERMEDIATE DEMOBILIZATION AND REMOBILIZATION**: **Measurement:** This item shall govern CONTRACTOR expenses for an OWNER-directed intermediate Project demobilization of personnel and equipment that occurs after the Contract Notice to Proceed has been given and work has been commenced, and the subsequent remobilization of personnel and equipment to complete the project. Related work shall include furnishing all labor, materials, tools, equipment, testing, and incidentals required to demobilize and remobilize for the Project, in accordance with the Contract Documents, Complete in Place. **Payment:** Each Intermediate Demobilization and Remobilization shall only be authorized upon a **written directive by OWNER**. Unit price payment for Item 16 will be full compensation for completing the Work, as shown on the Contract Documents or indicated under Division 01 through Division 46 for actual intermediate mobilization/demobilization up to quantity shown in the Proposal Form.

D. Additive Alternate

Item No.	Description
17	**REMOVE AND REPLACE EFFLUENT WEIR TROUGH (CLARIFIER NO. 1):** **Measurement:** This item includes all costs for the removal and replacement of the effluent weir trough h. It shall include, but is not limited to the demolition, equipment, installation, startup/commissioning, manufacturer's services, and all labor material, tools, equipment submittals, and incidentals required to perform the work in accordance with the contract documents, complete for lump sum price. **Payment: Unit price p**ayment for Item 17 will be full compensation for completing the Work, as shown on the Contract Documents or indicated under Division 01 through Division 46.

1.10 NONPAYMENT FOR REJECTED OR UNUSED PRODUCTS

A. Payment will not be made for following:
1. Loading, hauling, and disposing of rejected material.
2. Quantities of material wasted or disposed of in manner not called for under Contract Documents.
3. Rejected loads of material, including material rejected after it has been placed by reason of failure of CONTRACTOR to conform to provisions of Contract Documents.
4. Material not unloaded from transporting vehicle.
5. Defective Work not accepted by OWNER.
6. Material remaining on hand after completion of Work.

1.11 PARTIAL PAYMENT FOR STORED MATERIALS AND EQUIPMENT

A. Partial Payment: No partial payments will be made for materials and equipment delivered or stored unless Shop Drawings or preliminary operation and maintenance manuals are acceptable to OWNER.

B. Final Payment: Will be made only for products incorporated in Work; remaining products, for which partial payments have been made, shall revert to CONTRACTOR unless otherwise agreed, and partial payments made for those items will be deducted from final payment.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

SECTION 01 25 00
SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope: Section includes:
   1. Administrative and procedural requirements for selecting materials and equipment for the Project.
   2. Procedural requirements for substitutions of materials and equipment.
   3. Procedural requirements for substitute construction methods or procedures, when construction methods or procedures are specified.

B. A proposed substitute will not be accepted for review if:
   1. Approval would require changes in design concept or a substantial revision of the Contract Documents.
   2. Approval would delay completion of the Work or the work of other contractors.
   3. Substitution request is indicated or implied on a Shop Drawing or other submittal, or on a request for interpretation or clarification, and is not accompanied by CONTRACTOR's formal and complete request for substitution.
   4. Approval of substitution would require and increase in cost.

C. If proposed substitute is not approved, CONTRACTOR shall provide the specified materials, equipment, method, or procedure, as applicable.

D. Approval of a substitute does not relieve CONTRACTOR from requirement for submitting Shop Drawings and other submittals in accordance with the Contract Documents.

E. ENGINEER and OWNER have the right to rely upon the completeness and accuracy of the information included in CONTRACTOR's request for approval of a substitute, and CONTRACTOR accepts full responsibility for the completeness and accuracy thereof.

F. When approved substitute is defective or fail to perform in accordance with the Contract Documents, responsibility for remedying the defect or failure resides solely with CONTRACTOR and Supplier.

1.2 SUBSTITUTE MATERIALS AND EQUIPMENT

A. Requests for approval of substitute items of materials or equipment will be considered within a period of 7 days after the Notice to Proceed of the Contract. After the end of specified period, substitution requests will be considered only in case of unavailability of a specified item of material or equipment or other conditions beyond CONTRACTOR's control.

B. Procedure:
   1. Submit requests for substitution in accordance with requirements for furnishing submittals, as indicated in Section 01 33 00, Submittal Procedures.
   2. Submit separate request for each proposed substitute.
   3. Submit request for substitution using forms attached to this Section. Complete all information requested on each form, and enclose with the forms supplementary information as required. In addition to requirements of the General Conditions and information required on substitution request forms, include with each substitute request the following:
      a. Identification of the materials and equipment (as applicable), including manufacturer's name and address.
      b. Manufacturer's literature with description of the materials and equipment, performance and test data, and reference standards with which materials and equipment comply.
      c. Samples, when appropriate.
      d. Name and address of similar projects on which the materials and equipment were used, date of installation, and names and contact information (including telephone number) for the facility operations and maintenance manager.

1.3 SUBSTITUTE CONSTRUCTION METHODS OR PROCEDURES

A. The provisions of the General Conditions, as may be modified by the Supplementary Conditions, regarding substitute items of materials and equipment are hereby extended to apply to substitute construction methods or procedures.

B. Procedure:
   1. Submit requests for substitution in accordance with requirements for furnishing submittals, as indicated in Section 01 33 00, Submittal Procedures.
   2. Submit separate request for each proposed substitute.
   3. Submit request for substitution using forms attached to this Section. Complete all information requested on each form, and enclose with the forms supplementary information as required. In addition to requirements of the General Conditions and information required on substitution request forms, include with each substitute request the following:
      a. Detailed description of proposed method or procedure.
      b. Itemized comparison of the proposed substitution with the specified method or procedure.
      c. Drawings illustrating method or procedure.
      d. Other data required by ENGINEER to establish that proposed substitution is equivalent to specified method or procedure.

1.4 CONTRACTOR'S REPRESENTATIONS

A. In submitting request for substitution, CONTRACTOR represents that:
   1. CONTRACTOR has read and fully understands the provisions regarding substitutes as indicated in the General Conditions, as may be modified by the Supplementary Conditions.
   2. Substitution request is complete and includes all information required by the Contract Documents.
   3. CONTRACTOR certifications required by the General Conditions, as may be modified by the Supplementary Conditions, are valid and made with CONTRACTOR's full knowledge, information, and belief.
   4. CONTRACTOR will provide the same or better guarantees or warranties for proposed substitute as for the specified materials, equipment, methods, or procedures, as applicable.
   5. CONTRACTOR waives all Claims for additional costs or extension of time related to proposed substitute that subsequently may become apparent.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION

3.1 ATTACHMENTS

A. The documents listed below, and attached following this Section's "End of Section" designation, are part of this Specification Section.
   1. Substitution Request Form (two pages).
   2. Product Substitution Checklist (one page).

END OF SECTION

SUBSTITUTION REQUEST

Project: _____ Substitution Request Number: _____

_____ From: _____

To: _____ Date: _____

_____ Engineer Project. No. _____

Re: _____ Contract For: _____

Specification Title: _____ Description: _____

Section: _____ Page: _____ Article/Paragraph: _____

Proposed Substitute: _____

Manufacturer: _____ Address: _____ Phone: _____

Trade Name: _____ Model No.: _____

Installer: _____ Address: _____ Phone: _____

History: ☐ New product ☐ 1 to 4 years old ☐ 5 to 10 years old ☐ More than 10 years old

Differences between proposed substitute and specified item: _____

_____

_____

☐ Point-by-point comparative data attached — REQUIRED BY THE CONTRACT DOCUMENTS

Reason for not providing specified item: _____

_____

Similar Installation:

Project: _____ Engineer: _____

Address: _____ Owner: _____

_____ Date Installed: _____

Proposed substitution affects other parts of Work: ☐ No ☐ Yes; explain _____

_____

Savings to Owner for accepting substitute: ($)
(attach detailed, itemized estimate)

_____ _____

Proposed substitute changes Contract Time: ☐ No ☐ Yes [Add] [Deduct] _____ days.
(clarify whether change is to Substantial Completion, Milestone, or time for readiness for final payment)

Supporting Data Attached: ☐ Drawings ☐ Product Data ☐ Samples ☐ Tests ☐ Reports _____

SUBSTITUTION REQUEST
(Continued)

☐ Substitute product, method, or procedure is subject to payment of licensing fee or royalty (check if "yes" and attach information)

☐ Substitute product, method, or procedure is patented or copyrighted (check if "yes" and attach information)

The undersigned certifies:

- Representations in the General Conditions and in Section 01 25 00, Substitution Procedures, regarding substitutions are valid.
- Same or better warranty and guarantee will be furnished for proposed substitution as for specified item.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitute will have no adverse effect on other trades and will not affect or delay Progress Schedule.
- Cost data as stated above is complete. Claims for additional costs or time related to accepted substitution which may subsequently become apparent are waived.
- Proposed substitute does not affect dimensions and functional clearances.
- Payment will be made for Engineer's review and changes, if any, to the design and Contract Documents, and construction costs caused by the substitute.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by: _____

Signed by: _____

Firm: _____

Address: _____

_____

Telephone: _____

Attachments: ☐

ENGINEER'S REVIEW AND ACCEPTANCE (OR NON-ACCEPTANCE) WILL BE DOCUMENTED IN A FIELD ORDER OR CHANGE ORDER, AS APPROPRIATE. _____

Additional Comments: ☐ Contractor ☐ Subcontractor ☐ Supplier ☐ Manufacturer ☐ Engineer ☐ Other:

Adapted from CSI Form No. 13.0B, 2004 edition

PRODUCT SUBSTITUTION CHECKLIST

Date: _____ Re: _____

Engineer Proj No.: _____ Manufacturer's Project No.: _____

Filing No.: _____ Contract For: _____

Item Equivalence:

☐ Is the submitted item equivalent to the specified item? _____

☐ Does it serve the same function? _____

☐ Does it have the same dimensions? _____

☐ Does it have the same appearance? _____

☐ Will it last as long? _____

☐ Does it comply with the same codes, and standards and performance requirements? _____

☐ Has the item been used locally, and where are the projects? _____

_____

☐ Has a problem occurred with the item, and what was the remedy? _____

_____

Effect on the Project:

☐ Will the substitute affect other aspects of the construction? _____

☐ Are any details affected and are changes required? _____

☐ What is the cost of the changes? _____

☐ Who pays for the required changes? _____

☐ Are Contract Times affected? _____

_____

Effect on the Warranty:

☐ How does the proposed warranty differ from the specified warranty? _____

_____

☐ Does the manufacturer have a track record of standing behind the warranty? _____

_____

Adapted from CSI Form No. 20.3, 1998 edition

SECTION 01 29 73
SCHEDULE OF VALUES

PART 1 - GENERAL

1.1 DESCRIPTION

A. CONTRACTOR shall prepare and submit to ENGINEER for acceptance a Schedule of Values that allocates cost to each item of the work. Schedule of Value list of line items shall correspond to each aspect of the work, establishing in detail the portion of the Contract Price allocated to each major component of the work.

B. Upon request of ENGINEER, support values with data that substantiate their correctness.

C. Submit preliminary Schedule of Values to ENGINEER for initial review. CONTRACTOR shall incorporate ENGINEER's comments into the Schedule of Values and resubmit to ENGINEER. ENGINEER may require corrections and re-submittals until Schedule of Values is acceptable. The preliminary Schedule of Values will be reviewed by the OWNER and ENGINEER for acceptance.

D. Schedule of Values may be used as a basis for negotiating price of changes, if any, in the work.

E. Schedule of Values will be basis for preparing each Application for Payment.

F. Include in Schedule of Values unit price payment items with their associated quantity. Provide in the Schedule of Values detailed breakdown of unit prices when required by ENGINEER.

1.2 SUBMITTALS

A. Submit to ENGINEER Schedule of Values in the form and quantity required in Section 01 33 00 SUBMITTAL PROCEDURES.

B. Content of Schedule of Values submittals shall be in accordance with Article 1.3 of this Section.

C. Timing of Submittals:
   1. Submit preliminary Schedule of Values within time limit indicated in the General Conditions and Special Conditions.
   2. Submittal of the Schedule of Values for acceptance by ENGINEER shall be in accordance with the General Conditions. ENGINEER will not accept Applications for Payment without an approved Schedule of Values.

1.3 SCHEDULE OF VALUES FORMAT AND CONTENT

A. Prepare Schedule of Values on the "schedule of estimated progress payments," as applicable, of the Application for Payment form indicated in Section 01 29 76 PROGRESS PAYMENT PROCEDURES and in accordance with the

B. Include in Schedule of Values itemized list of work for each major work area included in the work, for each payment item specified in Section 01 29 76 PROGRESS PAYMENT PROCEDURES.

C. Organization in Accordance with Specification Sections:
   1. Within each work area, organize the Schedule of Values by the various Specifications Section numbers and titles included in the Contract Documents.
   2. Label each row in the Schedule of Values with the appropriate Specifications Section number. Include an amount for each row in the Schedule of Values.
   3. List sub-items of major products or systems, as appropriate or when requested by ENGINEER.

D. Include in Schedule of Values unit price payment items with their associated quantity. Provide in the Schedule of Values detailed breakdown of unit prices when required by ENGINEER.

E. Requirements for preliminary Schedule of Values and Schedule of Values are:
   1. Subcontracted work:
      a. Schedule of Values shall show division of work between the CONTRACTOR and Subcontractors.
      b. Line items for work to be done by Subcontractor shall include the word, "(SUBCONTRACTED)."

2. Apportionment between Materials and Equipment, and Installation:
   a. Schedule of Values shall include breakdown of costs for materials and equipment, installation, and other costs used in preparing the Bid by CONTRACTOR and each Subcontractor.
   b. List purchase and delivery costs for materials and equipment for which CONTRACTOR may apply for payment as stored materials.
3. Sum of individual values shown on the Schedule of Values shall equal the total of associated payment item. Sum of payment item totals in the Schedule of Values shall equal the Contract Price.
4. Overhead and Profit: Include in each line item a directly proportional amount of CONTRACTOR's overhead and profit. Do not include overhead and profit as separate item(s).
5. Include separate line item for each allowance, and for each unit price item.
6. In so far as possible, total quantities and unit prices shall be shown for all items of work, separating for each item the materials and labor and such other sub-items the CONTRACTOR may desire.
7. "Lump Sum" and "miscellaneous" and other such general entries in the Schedule shall be avoided whenever possible.
8. Such items as Bond premiums, insurance, temporary facilities and equipment storage may be listed separately in the Schedule provided the costs can be substantiated.
9. Overhead and profit shall not be listed as separate items in the Schedule.
10. Breakdown costs to list major products or operations for each line item which has an installed value of more than $20,000.
11. Bonds and Insurance Costs: Include line item for bonds and insurance in payment item for Mobilization, in amount not exceeding 2 percent of the Contract Price. This amount may be applied for in the first Application for Payment. Receipts from bonding and insuring agency must be provided to allocate payment.
12. Include relevant items for the General Conditions, permits (when applicable), construction Progress Schedule, and other items required by ENGINEER Include such items in Applications for Payment-on-payment schedule acceptable to ENGINEER.
13. Line items for Site maintenance such as dust control, compliance with storm water pollution prevention plans and permits, spill prevention control and countermeasures plan, and for construction photographic documentation; temporary utilities and temporary facilities, field offices, temporary controls, field engineering, and similar work shall be included in the Schedule of Values and proportioned in Applications for Payment throughout duration of the work.
14. Mobilization and Demobilization:
   a. Include separate line items under each appropriate payment item for mobilization and demobilization. Document for ENGINEER the activities included in mobilization and demobilization line items.
   b. Mobilization will be limited to ten percent of the Contract Price and will be paid as follows:
      1) When 1% of the adjusted contract amount for construction items is earned, 50% of the "lump sum" mobilization bid item will be paid.
      2) When 5% of the adjusted contract amount for construction items is earned, 75% of the "lump sum" mobilization bid item will be paid.
      3) When 10% of the adjusted contract amount for construction items is earned, 90% of the "lump sum" mobilization bid item will be paid.
      4) The remaining 10% of the mobilization bid item will be paid upon completion of all work.
   c. Demobilization shall be not less than 1 percent of the Contract Price, and shall be included with the Application for Payment following Substantial Completion, or other schedule acceptable to ENGINEER.
15. Costs for Shop Drawings, Samples, and other submittals; operations and maintenance manuals; field testing; and training of operations and maintenance personnel shall be as follows, unless otherwise accepted by ENGINEER:
   a. No direct or separate payment will be made for these items.
16. Project Record Documents:
   a. No direct or separate payment will be made for these items.
17. Schedule of Values shall include an itemized list of work-by-work area, as applicable, for work included.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

SECTION 01 29 76
PROGRESS PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes description and requirements of:
   1. Submittals Related to Payment Procedures.
   2. Allowances.
   3. Schedule of Values.
   4. Schedule of Estimated Progress Payments.
   5. Payment.
   6. Nonpayment for Rejected or Unused Products.
   7. Partial Payment for Stored Materials and Equipment.
   8. Partial Payment for Undelivered, Project Specific Manufactured or Fabrication Equipment.

B. Related sections:
   1. Section 01 22 13, MEASUREMENT AND PAYMENT
   2. Section 01 29 73, SCHEDULE OF VALUES

1.2 SUBMITTALS

A. Informational Submittals:
   1. Schedule of Values: Submit on CONTRACTOR's standard form.
   2. Schedule of Estimated Progress Payments:
      a. Submit with initially acceptable Schedule of Values.
      b. Submit adjustments thereto with Application for Payment.
   3. Application for Payment.
   4. Final Application for Payment.

1.3 ALLOWANCES

A. Allowances are defined in Section 01 22 13, MEASUREMENT AND PAYMENT.

B. Consult with OWNER/ENGINEER. Obtain proposals from Suppliers and installers and offer recommendations.

C. Allowances will be administered in accordance with the General Conditions and as specified herein.

D. CONTRACTOR Agrees:
   1. The Lump Sum Work includes the allowances specified and includes all Work to perform such items covered by the Allowance as approved by OWNER and ENGINEER.
   2. The Allowances include the cost of material and equipment required by the allowances to be delivered to the Site and applicable taxes.
   3. CONTRACTOR's cost for unloading, handling, labor, installation cost, overhead, profit, and other expenses for the allowance have been included in the Lump Sum Work and not in the allowance.
   4. Accept payment equal to the amount of the actual invoices for services and products without markup.

E. Expenditure of any portion of Allowances shall only be done with authorization by OWNER and ENGINEER. Allowances are estimated amounts and final payment shall be based on actual costs as authorized by Change Order and the Contract Price shall be correspondingly adjusted.

1.4 SCHEDULE OF VALUES

A. Prepare a separate Schedule of Values for the schedule of the Work under the Agreement.

B. Upon request of OWNER/ENGINEER, provide support documentation to support the accuracy of the Schedule of Values.

C. Unit Price Work: Reflect unit price quantity and price breakdown from Proposal Form.

D. Lump Sum Work:
   1. Reflect Schedule of Values format included in Proposal Form, specified allowances, alternates, and equipment selected by OWNER, as applicable.
   2. List bonds and insurance premiums, mobilization, demobilization, preliminary and detailed progress schedule preparation, facility startup, and contract closeout separately.
   3. Break down by Division 2 through 46 with appropriate subdivision of each specification for each Project facility.

E. An unbalanced or front-end loaded schedule will not be acceptable.

F. Summation of the complete Schedule of Values representing all the Work shall equal the Contract Price.

G. Submit Schedule of Values in a spreadsheet format compatible with latest version of Microsoft Excel.

1.5 SCHEDULE OF ESTIMATED PROGRESS PAYMENTS

A. Show estimated payment requests throughout Contract Times aggregating initial Contract Price.

B. Base estimated progress payments on initially acceptable progress schedule. Adjust to reflect subsequent adjustments in progress schedule and Contract Price as reflected by modifications to the Contract Documents.

1.6 APPLICATION FOR PAYMENT

A. Scope: CONTRACTOR's requests for payment shall be in accordance with the Agreement, General Conditions and Supplementary Conditions, and the Specifications.

B. Procedure:
   1. Review with OWNER/ENGINEER quantities and the Work proposed for inclusion in each progress payment. Application for Payment shall cover only the Work and quantities recommended by the OWNER/ENGINEER.
   2. CONTRACTOR will be required to review with OWNER/ENGINEER the status of record documents in connection with OWNER's review of each Application for Payment.
   3. Submit Application for Payment to OWNER. Include the following documents with each monthly payment application:
      a. Updated Work Progress Schedule as pdf and Microsoft Project or Primavera files.
      b. Updated redlines/record drawings.
      c. Narrative/Daily Log documenting Weather Days/Delay Request for previous month.

1.7 NONPAYMENT FOR REJECTED OR UNUSED PRODUCTS

A. Payment will not be made for following:
   1. Loading, hauling, and disposing of rejected material.
   2. Quantities of material wasted or disposed of in manner not called for under Contract Documents.
   3. Rejected loads of material, including material rejected after it has been placed by reason of failure of CONTRACTOR to conform to provisions of Contract Documents.
   4. Material not unloaded from transporting vehicle.
   5. Defective Work not accepted by OWNER.
   6. Material remaining on hand after completion of Work.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

SECTION 01 31 19
PROJECT MEETINGS

PART 1 - GENERAL

1.1 PRE-CONSTRUCTION CONFERENCE

A. Date, time, and Location:
   1. OWNER will schedule a pre-construction conference after execution of the Contract and before construction is started at the site.

B. Attendance Required:
   1. CONTRACTOR and major subcontractors.
   2. OWNER's representative(s).
   3. Representatives of government agencies having any degree of control or responsibility, if available.

C. Agenda:
   1. Agenda will include, but will not necessarily be limited to, the following:
      a. Distribution of Contract Documents.
      b. Designation of personnel representing the parties in Contract and the Architect/Engineer.
      c. Review of Insurance.
      d. Discussion of format for schedule of values and construction schedule.
      e. Processing of Shop Drawings and distribution of Submittals, Change Orders, Request for Information, and Contract Closeout.
      f. Processing and Schedule of Payments.
      g. Working hours and overtime.
      h. Use of premises.
      i. Security.
      j. Housekeeping.
      k. Record Drawings.
      l. Letter of Authorization to Proceed.
      m. Any other project related items.

D. Submittals Required Prior to Pre-Construction Conference:
   1. Not less than three (3) days prior to the pre-construction conference, submit the following preliminary documents:
      a. Preliminary Project Schedule
      b. Preliminary Schedule of Submittals
      c. Preliminary Schedule of Values
      d. Listing of planned subcontractors and suppliers. Indicate extent of each subcontract proposed and overall percentage of Contract Price to be subcontracted.

E. Handouts for the Pre-Construction Conference
   1. CONTRACTOR shall bring the following, with sufficient copies for each attendee the following:
      a. Preliminary Project Schedule
      b. Preliminary Schedule of Submittals
      c. Preliminary Schedule of Values

1.2 PROGRESS MEETINGS

A. Date and Time:
   1. Regular monthly meetings or as designated by OWNER.
   2. Sequencing Meetings.
   3. Other meetings may be on call.

B. Place:
   1. Project field office or another pre-designated place by OWNER.

C. ENGINEER shall prepare agenda, preside at meetings, and prepare and distribute a transcript of proceedings to all parties.

D. CONTRACTOR shall provide data required and be prepared to discuss all items on agenda.

E. Minimum Attendance:
   1. CONTRACTOR and subcontractor's representatives present for each party shall be authorized to act on their behalf.
   2. OWNER's representative(s).

F. Agenda will include but not necessarily be limited to the following:
   1. Review of minutes of previous meeting.
   2. Review of work progress schedule submittal pay estimates, and payroll and compliance submittals.
   3. Field observations, problems, and decisions.
   4. Review of submittal schedule and status of submittals.
   5. Review of Request for Information (RFI), Request for Proposal (RFP) Status.
   6. Change Orders Status.
   7. Coordination with OWNER and/or other CONTRACTORS.
   8. Progress since last meeting.
   9. Project schedule updates.
   10. Planned progress for next meeting.
   11. Other Business.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

SECTION 01 31 26
ELECTRONIC COMMUNICATION PROTOCOLS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:
   1. This Section establishes the procedures with which the parties will comply regarding transmission or exchange of electronic data for the Project.
   2. CONTRACTOR shall provide labor, materials, tools, equipment, services, utilities, and incidentals shown, specified, and required for complying with this Section throughout the Project.
   3. This Section does not supersede the General Conditions, as may be modified by the Supplementary Conditions, regarding transmitting of the Contract Documents to CONTRACTOR after the Effective Date of the Contract.
   4. In addition to the requirements of this Section, comply with requirements for exchange of electronic data in the following:
      a. Section 01 33 00, SUBMITTAL PROCEDURES.
      b. Section 01 34 00, PHOTOGRAPHIC AND VIDEO DOCUMENTATION.
      c. Section 01 78 39, PROJECT RECORD DOCUMENTS.

B. Coordination:
   1. CONTRACTOR shall require all Subcontractors and Suppliers to comply with the electronic communication protocols established in this Section.

C. Related Sections:
   1. Section 01 33 00, SUBMITTAL PROCEDURES.
   2. Section 01 34 00, PHOTOGRAPHIC AND VIDEO DOCUMENTATION.
   3. Section 01 78 39, PROJECT RECORD DOCUMENTS.

1.2 TERMINOLOGY

A. The following words or terms are not defined but, when used in this Section, have the following meaning:
   1. “Electronic data” means information, communications, drawings, or designs created or stored for the Project in electronic or digital form.
   2. “Confidential information” means electronic data that the transmitting party has designated as confidential and clearly marked with an indication such as “Confidential”, “Business Proprietary”, or similar designation.
   3. “Written” or “in writing” means any and all communications, including without limitation a notice, consent, or interpretation, prepared and sent to an address provided in the Contract Documents or otherwise agreed upon by the parties and ENGINEER using a transmission method sent forth in this Section that allows the recipient to print or store the communication. Communications transmitted electronically are presumed received when sent in conformance with this Paragraph 1.2.A.3.

1.3 TRANSMISSION OF ELECTRONIC DATA

A. Transmission of electronic data constitutes a warrant by the transmitting party to the receiving party that the transmitting party is one or more of the following:
   1. The copyright owner of the electronic data.
   2. Has permission from the copyright owner to transmit the electronic data for its use on the Project.
   3. Is authorized to transmit confidential information.

B. Receiving party agrees to keep confidential information confidential and not to disclose it to another person except to (1) its employees, (2) those who need to know the content of the confidential information to perform services or construction solely and exclusively for the Project, or (3) its consultants, contractors, Subcontractors, and Suppliers whose contracts include similar restrictions on the use of electronic data and confidential information.

C. Transmitting party does not convey any right in the electronic data or in the software used to generate or transmit such data. Receiving party may not use electronic data unless permission to do so is provided in the Contract Documents, or in a separate license.

D. Unless otherwise granted in a separate license, receiving party's use, modification, or further transmission of electronic data, as provided the Contract Documents, is specifically limited to the design and construction of the Project in accordance with this Section, and nothing contained in this Section conveys any other right to use the electronic data for any other purpose.

E. To the fullest extent permitted by Laws and Regulations, receiving party shall indemnify and defend the transmitting party from and against all claims arising from or related to receiving party's modification to, or unlicensed use of, electronic data.

F. Means of Transmitting Electronic Data: Unless otherwise indicated in Table 01 31 26-A of this Section or elsewhere in the Contract Documents, transmission of electronic data for the Project will generally be via:
   1. E-mail and files attached to e-mail. Maintain e-mail system capable of transmitting and receiving files not less than 20 megabytes (MB) file size.

1.4 ELECTRONIC DATA PROTOCOLS

A. Comply with the data formats, transmission methods, and permitted uses set forth in Table 01 31 26-A, Electronic Data Protocol Table, below, when transmitting or using electronic data on the Project. Where a row in the table has no indicated means of transmitting electronic data, use for such documents only printed copies transmitted to the receiving party via appropriate delivery method.

TABLE 01 31 26-A
ELECTRONIC DATA PROTOCOL TABLE (E-MAIL ATTACHMENTS)

Electronic Data	Data Format	Transmitting Party	Transmission Method	Receiving Party	Permitted Uses	Notes
1.4.A.1. Project communications						
General communications & correspondence	EM, PDF	O, E, C	EM, EMA	O, E, C	**R**	
Meeting notices and agendas	EM, PDF	E	EM, EMA	O, C	**R**	
Meeting minutes	PDF	E	EM, EMA	O, C	**R**	
1.4.A.2. Contractor's submittals to Engineer						
Shop Drawings	PDF	C	EM, EMA	E	**M (1)**	**(1)**
Product data	PDF	C	EM, EMA	E	**M (1)**	**(1)**
Informational and closeout submittals:	PDF	C	EM, EMA	E	**M (1)**	**(1) (6)**
Documentation of delivery of maintenance materials submittals	PDF	C	EM, EMA	E	**M (1)**	
1.4.A.3. Engineer's return of reviewed submittals to Contractor						
Shop Drawings	PDF	E	EM, EMA	O., C	**R**	
Product data	PDF	E	EM, EMA	O., C	**R**	
Informational and closeout submittals:	PDF	E	EM, EMA	O., C	**R**	**(6)**
Documentation of delivery of maintenance materials submittals	PDF	E	EM, EMA	O. C	**R**	
1.4.A.4. Contract Modifications Documents						
Requests for interpretation to Engineer	PDF	C., O	EM, EMA	E	**M (1)**	**(1)**
Engineer's interpretations (RFI responses)	PDF	E	EM, EMA	C, O	**R**	
Engineer's clarifications to Contractor	EM, PDF	E	EM, EMA	C, O	**R**	
Engineer's issuance of Field Orders	PDF	E	EM, EMA	C, O	**R**	

Electronic Data	Data Format	Transmitting Party	Transmission Method	Receiving Party	Permitted Uses	Notes
Proposal Requests	PDF	E, O	EM, EMA	C	**R**	
Change Proposals – submitted to Engineer	PDF	C	EM, EMA	O, E	**S**	
Change Proposals – Engineer's response	PDF	E	EM, EMA	C. O		
Work Change Directives (for Contractor signature)	PDF	E	EM, EMA	C	**R**	**(2)**
Change Orders (for Contractor signature)	PDF	E	EM, EMA	C	**R**	**(2)**
1.4.A.5. Applications for Payment			EM, EMA			**(3)**
1.4.A.6. Claims and other notices			EM, EMA			**(4)**
1.4.A.7. Closeout Documents			EM, EMA			
Record drawings	DWG and PDF	C	EM, EMA	E, O	**M (5)**	**(5)**
Other record documents	PDF	C	EM, EMA	E. O	**M (5)**	**(5)**
Contract closeout documents						

B. Key to Electronic Data Protocol Table: 02196040 01 31 26-3 Electronic Communications

Data Format:		
	EM	.msg, .htm, .txt, .rtf, e-mail text
	W	docx, Microsoft® Word 2007 or later
	EX	.xlsx, Microsoft® Excel 2007 or later
	PDF	.pdf. Portable Document Format
	DWG	.dwg. Autodesk AutoCAD 2013 drawing
Transmission Party:		
	O	OWNER
	C	CONTRACTOR
	E	ENGINEER
Transmission Method:		
	EM	Via e-mail
	EMA	As an attachment to an e-mail transmission
	CD	Delivered via compact disc
	PW	Posted to Project website
	FTP	FTP transfer to receiving FTP server
Receiving Party:		
	O	OWNER
	C	CONTRACTOR
	E	ENGINEER
Permitted Uses:		
	S	Store and view only
	R	Reproduce and distribute
	I	Integrate (incorporate additional electronic data without modifying data received)
	M	Modify as required to fulfill obligations for the Project
Notes:		
	(1)	Modifications by ENGINEER to CONTRACTOR's submittals and

		requests for interpretations are limited to printing out, marking-up, and adding comment sheets.
	(2)	May be distributed only to affected Subcontractors and Suppliers. Print out, sign document, and return executed printed copy originals to ENGINEER.
	(3)	Submit printed Applications for Payment with original (“wet”) signatures.
	(4)	Submit notices, including Claims, in accordance with the notice provisions of the General Conditions, as may be modified by the Supplementary Conditions.
	(5)	Submit record drawings in native CAD format indicated when CONTRACTOR has executed ENGINEER’s standard agreement for release of electronic files. In addition, always submit record drawings as a PDF file. Comply with requirements of Section 01 78 39, PROJECT RECORD DOCUMENTS.
	(6)	For operation and maintenance data, also submit printed copies as required by Section 01 78 23, OPERATIONS AND MAINTENANCE DATA.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

SECTION 01 33 00
SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SCOPE SUMMARY

A. Submittal procedures apply to the following:
1. Schedule of Values.
2. Construction Schedules.
3. Shop Drawings, Product Data, and Sampler/Operations and Maintenance.
4. Manufacturer's Certificates.
5. Construction Photographs.
6. Project Record Documents.
7. Video Tapes.
8. Design Mixes.
9. Accident Reports
10. Safety Plan
11. Test and Inspection Reports

1.2 SUBMITTAL PROCEDURES

A. Scheduling and Handling:
1. Schedule submittals well in advance of the need for the material or equipment for construction. Allow time to make delivery of material or equipment after submittal is approved.
2. Develop a submittal schedule that allows sufficient time for initial review, correction, resubmission and final review of all submittals. The OWNER/ENGINEER will review and return submittals to the CONTRACTOR as expeditiously as possible, but the amount of time required for review will vary depending on the complexity and quantity of data submitted. In no case will a submittal schedule be acceptable which allows less than 30-days for initial review by the OWNER/ENGINEER. This time for review shall in no way be justification for delays or additional compensation to the CONTRACTOR.
3. Submit electronic PDF file of documents. OWNER reserves the right to request hard copies of submittals.
4. Distribution of all submittals will be made via e-mail.
5. Action Submittal Dispositions: ENGINEER will review, mark, and stamp as appropriate, and distribute marked-up copies as noted:
   a. APPROVED:
      1) CONTRACTOR may incorporate product(s) or implement Work covered by submittal.
   b. APPROVED AS NOTED:
      1) CONTRACTOR may incorporate product(s) or implement Work covered by submittal, in accordance with ENGINEER’s notations.
   c. REVISE AND RESUBMIT:
      1) CONTRACTOR may not incorporate product(s) or implement Work covered by submittal without revisions in accordance with ENGINEER’s notations.
   d. REJECTED:
      1) CONTRACTOR may not incorporate products(s) or implement Work covered by the submittal and needs to develop an alternate Submittal.
6. The CONTRACTOR shall assume the risk for material or equipment which is fabricated or delivered prior to approval. No material or equipment shall be incorporated into the Work or included in periodic progress payments until approval has been obtained in the specified manner.
7. If more than one re-submission is required because of failure of the CONTRACTOR to provide all previously requested corrected data or information, the CONTRACTOR shall reimburse the OWNER for the charges of ENGINEER for review and processing of the additional resubmission upon project completion.

B. Transmittal Form and Numbering:

1. Provide transmittal form for each submittal.
2. Sequentially number each transmittal form beginning with the number 1. Re-submittals shall use the original number with an alphabetic suffix (i.e., 2A for first re-submittal of Submittal 2 or 15C for third re-submittal of Submittal 15). Each submittal shall only contain one type of work, material, or equipment. Mixed submittals will not be accepted.
3. Identify variations from requirements of Contract Documents and identify product or system limitations.
4. For submittal numbering of video tapes, see paragraph 1.09 Video.

C. CONTRACTOR'S Stamp:
1. Apply CONTRACTOR'S stamp, certifying that the items have been reviewed in detail and are correct and in accordance with Contract Documents, except as noted by any requested variance.
2. As a minimum, Contractor's Stamp shall include:
   a. CONTRACTOR'S name.
   b. Job number.
   c. Submittal number.
   d. Certification statement that the CONTRACTOR has reviewed the submittal and it is in compliance with the Contract Documents.
   e. Signature line for CONTRACTOR.

1.3 SCHEDULE OF VALUES

A. Submit a Schedule of Values in accordance with Section 01 29 73, SCHEDULE OF VALUES.

1.4 CONSTRUCTION SCHEDULES

A. Submit Construction Schedules as provided in Article 5.13 of the General Conditions.

B. Submit in pdf and in MS Project Format.

1.5 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

A. Submit shop drawings in accordance with Section 01 33 00, SUBMITTAL PROCEDURES.

1.6 MANUFACTURER'S CERTIFICATES

A. When specified in Specification sections, submit manufacturers' certificate of compliance for review by OWNER/ENGINEER.

B. Contractor's Stamp, as described in paragraph 1.02C, shall be placed on front page of the certification.

C. Submit supporting reference data, affidavits, and certifications as appropriate.

D. Certificates may be recent or previous test results on material or product but must be acceptable to OWNER/ENGINEER.

1.7 CONSTRUCTION PHOTOGRAPHS

A. Submit Construction Photographs in accordance with Section 01 34 00, PHOTOGRAPHIC AND VIDEO DOCUMENTATION.

1.8 PROJECT RECORD DOCUMENTS

A. Submit Project Record Documents in accordance with Article 3.3.1 of the General Conditions.

1.9 VIDEO

A. Submit Pre- and Post-Construction videos as required in Article 5.3.9 of the General Conditions.

B. Transmittal forms for video tapes shall be numbered sequentially beginning with T01, T02, T03, etc.

1.10 DESIGN MIXES

A. When specified in Specifications, submit design mixes for review.

B. CONTRACTOR'S Stamp, as described in paragraph 1.02C, shall be placed on front page of each design mix.

C. Mark each design mix to identify proportions, gradations, and additives for each class and type of design mix submitted. Include applicable test results on samples for each mix.

D. Maintain a copy of approved design mixes at mixing plant.

1.11 MISCELLANEOUS SUBMITTALS

A. The following documents shall be submitted as described in Section 1.2.
   1. Accident reports.
   2. Inspection and test reports.
      a. Guarantees and warranties.
   3. Traffic Control Plan.
   4. Erosion and Sedimentation Control Plan.
   5. Safety Plan:
      a. Refer to Section 01 35 29, SAFETY PLAN.

1.12 REQUESTS FOR SUBSTITUTION

A. General:
   1. Base all bid on materials, equipment, and procedures specified.
   2. Certain types of equipment and kinds of material are described in specifications by means of references to name of manufacturers and vendors, trade names, or catalog numbers. When this method of specifying is used, it is not intended to exclude from consideration other products bearing other manufacturer's or vendor's names, trade names, or catalog numbers, provided said products are capable of accomplishing the same tasks as the products specifically indicated.
   3. Other types of equipment and kinds of material may be acceptable.

B. Quality Assurance:
   1. The Contractor will document each request with complete data substantiating compliance of proposed substitution with the Contract Documents. Each request constitutes a declaration from the Contractor that:
      a. The Contractor has investigated the proposed product and determined that it meets or exceeds, in all respects, the specified product and will perform the function intended.
      b. The Contractor will provide the same warranty and guarantee for substitution as for the specified product.
      c. The Contractor will coordinate installation and make all other changes, including building modifications if necessary, and make such changes as may be required for work to be complete in all respects.
      d. The Contractor waives claims for additional costs which may subsequently become apparent.

C. Procedure for Requesting Substitution:
   1. Only after execution of the Contract will the OWNER consider requests from the Contractor for substitutions. Substitutions will be considered only when a product becomes unavailable due to no fault of the Contractor or is shown to be superior to the specified product.
   2. Written requests through Contractor only.
   3. Substitutions will not be considered when they are indicated or implied on shop drawings or product data submittals without a separate written request, or when acceptance will require substantial revision of the Contract Documents.
   4. OWNER will determine acceptability of proposed substitution and will notify Contractor of acceptance or rejection in writing within a reasonable period of time.
   5. Transmittal Mechanics:
      a. Follow the transmittal mechanics prescribed for shop drawings in this Section.
      b. Product substitution will be treated in a manner similar to "deviations" as described in this Section.
      c. List the deviation and justifications on the transmittal form in the space provided under the column with the heading "Description."
      d. Include in the transmittal letter, either directly or as a clearly marked attachment, the items listed in paragraph C.6 below.
   6. Transmittal Contents:
      a. Product Identification:

1) Manufacturer's name.
2) Telephone number and representative contact name.
3) Specification section or drawing reference of originally specified product, including discrete name or tag number assigned to original product in the Contract Documents.

b. Manufacturer's literature clearly marked to show compliance of proposed product with Contract Documents.
c. Itemized comparison of original and proposed product addressing product characteristics including but not necessarily limited to:
   1) Size.
   2) Composition or materials of construction.
   3) Weight.
   4) Electrical or mechanical requirements.
d. Product Experience:
   1) Location of past projects utilizing product.
   2) Name and telephone number of persons associated with referenced projects knowledgeable concerning proposed product.
   3) Available field data and reports associated with proposed product.
e. Data relating to changes in construction schedule.
f. Data relating to changes in cost.
g. Samples:
   1) At request of ENGINEER.
   2) Full size if requested by ENGINEER.
   3) Held until substantial completion.
   4) ENGINEER not responsible for loss or damage to supplies.

D. Approval or rejection:
   1. Written approval or rejection of substitution given by OWNER.
   2. OWNER reserves the right to require proposed product to comply with color and pattern of specified product, if necessary, to secure design intent.
   3. In event substitution results in a change of Contract price or time, provisions in General Conditions will be applied for adjustment.
   4. Substitutions will be rejected if:
      a. Submittal is not through the Contractor with his stamp of approval.
      b. Requests are not made in accordance with this Section.
      c. In the ENGINEER’s opinion, acceptance will require substantial revision of the original design.
      d. In the ENGINEER’s opinion, substitution is not equal to original product specified or will not perform adequately the function for which it was intended.
   5. Only one request for substitution will be considered for each product. When substitution is not accepted, the Contractor will provide the specified product.

1.13 SUPPLEMENTS

A. The supplement listed below, following “END OF SECTION”, is a part of this specification.
   1. Transmittal of Contractor’s Submittal.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

TRANSMITTAL OF CONTRACTOR'S SUBMITTAL

DATE:_____

TO:_____ **SUBMTTAL NO:**_____

_____ ☐ **New Submittal** ☐ **Resubmittal**

_____ **PROJECT:**_____

_____ **PROJECT NO.**_____

_____ **SPECIFICATION SECTION NO.:**_____
(Cover only one section with each submittal)

FROM:_____ **SCHEDULE DATE OF SUBMITTAL:**
CONTRACTOR _____

_____

_____

_____

SUBMITTAL TYPE: ☐ Shop Drawing ☐ Sample ☐ Informational

The following items are hereby submitted:

Number of Copies	Description of Item Submitted (Type, Size, Model Number, Etc.)	Spec. and Para. No.	Drawing or Brochure Number	Contains Variation to Contract	
				No	Yes

CONTRACTOR hereby certifies that (i) CONTRACTOR has complied with the requirements of Contract Documents in preparation, review, and submission of designated Submittal and (ii) the Submittal is complete and in accordance with the Contract Documents and requirements of laws and regulations and governing agencies.

By:_____
CONTRACTOR (Authorized Signature)

SECTION 01 34 00

PHOTOGRAPHC AND VIDEO DOCUMENTATION

PART 1 - GENERAL

1.1 GENERAL

A. CONTRACTOR shall be responsible to produce construction photographs as provided herein. CONTRACTOR shall provide construction photographs taken on first working day of each month, prior to demolitions, during demolitions and other significant stages of construction.

1.2 QUALITY

A. Photographs shall be digital color photographs. Each print shall be marked with the name of CONTRACTOR, description and location of view and identity of photographer.

1.3 VIEWS AND QUANTITIES

A. Each month, an average of 30 photographs shall be taken. Provide photographs showing the preconstruction site, construction progress and the post construction site.

PART 2 - PRODUCTS

2.1 PRE-CONSTRUCTION AND POST-CONSTRUCTION PHOTOGRAPHS AND VIDEOS

A. Pre- and post-construction photographs and videos of grit removal system shall be taken. Post-construction photographs and videos shall be taken within ten (10) days following the date of substantial completion.

B. All Photographs and videos shall be provided in USB Flash Drive.

2.2 PROGRESS PHOTOGRAPHS

A. Take progress photographs at intervals to coincide with each pay estimate application to show status of construction and progress.

2.3 QUALITY

A. Provide photographs with a minimum digital photo resolution setting of 3.0 MP.

PART 3 - EXECUTION

3.1 EXECUTION

A. These photographs shall be submitted with the CONTRACTOR’s application for progress payment.

B. Technique is to present important factual details with high resolution, minimum distortion, maximum depth-of-field, and sharpness. Views shall adequately illustrate project status or condition of construction.

END OF SECTION

SECTION 01 35 29
SAFETY PLAN

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes: Development and Maintenance of a Safety Plan.

1.2 REFERENCES

A. National Fire Protection Association (NFPA):
   1. 70E -Standard for Electrical Safety in the Workplace.

B. Occupational Safety and Health Standards (OSHA).

C. United States Code of Federal Regulations (CFR), Title 29.

1.3 SAFETY PLAN

A. Detail the Methods and Procedures to comply with NFP A 70E Standard for Electrical Safety in the Workplace, Federal, and Local Health and Safety Laws, Rules and Requirements for the duration of the Contract Times. Methods and procedures must also comply with the OWNER's Safety Plan. Include the following:
   1. Identification of the Certified or Licensed Safety Consultant (CONTRACTOR's Safety Manager) who will prepare, initiate, maintain and supervise safety programs, and procedures.
   2. Procedures for providing workers with an awareness of safety and health hazards expected to be encountered during construction.
   3. Safety equipment appropriate to the safety and health hazards expected to be encountered during construction. Include warning devices, barricades, safety equipment in public right-of-way and protected areas, safety equipment used in multi-level structures, personal protective equipment (PPE) as required by NFPA 70E.
   4. Methods for minimizing employees' exposure to safety and health hazards expected during construction.
   5. Procedures for reporting safety or health hazards.
   6. Procedures to follow to correct a recognized safety and health hazard.
   7. Procedures for investigation of accidents, injuries, illnesses, and unusual events that have occurred at the construction site.
   8. Periodic and scheduled inspections of general work areas and specific workstations.
   9. Training for employees and workers at the jobsite.
   10. Methods of communication of safe working conditions, work practices and required personal protection equipment.

B. Assume responsibility for every aspect of Health and Safety on the jobsite, including the health and safety of subcontractors, suppliers, and other persons on the jobsite:
   1. Forward available information and reports to the CONTRACTOR's Safety Manager who shall make the necessary recommendations concerning worker health and safety at the jobsite.
   2. Employ additional health and safety measures specified by the CONTRACTOR's Safety Manager, as necessary, for workers in accordance with OSHA guidelines.

C. Transmit to OWNER and ENGINEER copies of reports and other documents related to accidents or injuries encountered during construction.

D. The CONTRACTOR shall submit a Safety and Health Plan to the OWNER prior to start of construction that complies with current OSHA requirements, industry standards, and appropriate other local, state, and federal statutes, ordinances, and regulatory guidelines. The purpose of the safety plan shall be to establish and administer an effective management system to prevent or adequately control loss potential and to minimize personal injuries, occupational illnesses and damage to equipment and property. The objective of the safety plan must be specified and shall be project-specific and, in addition to expected features, shall address any unusual or unique aspects of the project for which it is written.

1. The plan shall address fall protection and prevention against chemical exposure.
2. A Spill Response Plan shall also be provided.

E. CONTRACTOR to obtain OWNER's electrical safety program.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

SECTION 01 40 00
QUALITY CONTROL

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. This section describes the requirements for quality control necessary for the execution of this contract. Requirements within the following subject areas are included:
   1. General Quality Control
   2. Workmanship
   3. Manufacturer's Instructions
   4. Manufacturer's Certificates
   5. Manufacturer's Field Services
   6. Testing Laboratory Services

1.2 GENERAL QUALITY CONTROL

A. The CONTRACTOR shall maintain control over subcontractor's suppliers, manufacturers, products, services, site conditions, and workmanship to produce work of a specified quality.

B. CONTRACTOR will comply with industry standards except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship is required.

C. CONTRACTOR will produce work that meets or exceeds workmanship standards described in these specifications.

1.3 MANUFACTURER'S INSTRUCTIONS

A. CONTRACTOR shall comply with published instructions in full detail, including each in-step sequence recommended by the manufacturer. In the event that these instructions conflict with these specifications, the CONTRACTOR shall obtain clarification from the OWNER.

1.4 MANUFACTURER'S CERTIFICATES

A. CONTRACTOR shall submit manufacturer certificates that guarantee compliance with the specified requirements when indicated by these specifications.

1.5 MANUFACTURER'S FIELD SERVICES

A. As specified in Section 01 64 00 MANUFACTURERS FIELD SERVICES and when required in respective specification sections, the CONTRACTOR will require manufacturers to provide qualified personnel to observe field conditions; conditions of surfaces and previous installations; quality of workmanship; start-up of equipment; test, adjust, and balance of equipment as applicable, and to make appropriate recommendations.

B. CONTRACTOR shall submit written report to the Consultant listing manufacturer's observations and recommendations.

END OF SECTION

SECTION 01 42 00
REFERENCES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:
   1. Section includes the following:
      a. Definitions and terminology in general use in the Contract Documents.
      b. Applicable codes.
      c. Abbreviations in general use throughout the Contract Documents.
      d. General requirements regarding reference standards, including a listing of standard-issuing organizations (and their acronyms) used in the Contract Documents.

1.2 DEFINITIONS AND TERMINOLOGY

A. Definitions and terminology applicable to all the Contract Documents are included in the General Conditions, as may be modified by the Supplementary Conditions.

B. Additional terminology used in the Contract Documents includes the following:
   1. “Indicated” refers to graphic representations, notes, or schedules on the Drawings, or to other paragraphs, provisions, tables, or schedules in the Specifications and similar locations in the other Contract Documents. Terminology such as “shown”, “noted”, “scheduled”, and “specified” are used to help the user locate the reference without limitation on the location.
   2. “Installer”, “applicator”, or “erector” is CONTRACTOR or another person or entity engaged by CONTRACTOR, either as an employee or Subcontractor, to perform a particular construction activity, including installation, erection, application, or similar Work. Installers shall be experienced in the Work that installer is engaged to perform.
      a. The term “experienced”, when used in conjunction with the term “installer”, means having successfully completed not less than five previous projects similar in size and scope to this Project; being familiar with the special requirements indicated and required; being familiar with Laws and Regulations; and having complied with requirements of authorities having jurisdiction, and complying with requirements of the Supplier of the material or equipment being installed, unless other experience requirements specific to that element of the Work are indicated elsewhere in the Contract Documents.
   3. Trades: Use of terms such as “carpentry” does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as “carpenter”, unless otherwise indicated in the Contract Documents or required by Laws or Regulations. Such terminology also does not imply that specified requirements apply exclusively to trade personnel of the corresponding generic name.
   4. “Assigned specialists ”and similar terms: Certain Sections of the Specifications require that specific construction activities be performed by specialists with recognized, extensive experience in such operations. Engage said specialists for such activities, and their engagement is a requirement over which CONTRACTOR has no option. These requirements do not conflict with enforcement of building codes and other Laws and Regulations. Also, such requirements are not intended to interfere with local trade union jurisdictional settlements and similar conventions. Such assignments shall not relieve CONTRACTOR of responsibility for complying with the requirements of the Contract Documents.

1.3 APPLICABLE CODES

A. References in the Contract Documents to local code(s) shall mean the following:
   1. Texas Commission on Environmental Quality (TCEQ).
   2. National Electric Code in effect at the location of the Project.
   3. NFPA 101, Life Safety Code.

1.4 ABBREVIATIONS

A. Common abbreviations that may be found in the Contract Documents are indicated below, alphabetically by their written-out meaning:

alternating current	a-c
ampere	A
antemeridian	a.m.
Architectural Barriers Act	ABA
Americans with Disabilities Act	ADA
Americans with Disabilities Act Accessibility Guidelines	ADAAG
ante meridian	a.m.
average	avg
biochemical oxygen demand	BOD
five-day biochemical oxygen demand	BOD_5
brake horsepower	bhp
British thermal unit	Btu
building information model	BIM
carbonaceous biochemical oxygen demand	CBOD
five-day carbonaceous biochemical oxygen demand	$CBOD_5$
chemical oxygen demand	COD
Centigrade (or Celsius)	C
chlorinated polyvinyl chloride	CPVC
chlorofluorocarbons	CFC
Code of Federal Regulations	CFR
computer-aided drafting and design	CADD, or CAD
cubic inch	cu in
cubic foot	cu ft
cubic yard	cu yd, or CY
cubic feet per minute	cfm
cubic feet per second	cfs
decibel	db
degree Centigrade (or Celsius) (Write)	degrees C, °C, or deg C
degrees Fahrenheit	degrees F, °F, or deg F
diameter	dia
direct current	d-c
dollars	$
each	ea
efficiency	eff
Fahrenheit	F
feet	ft

feet per hour	fph, or ft/hr
feet per minute	fpm
feet per second	fps, or ft/min
figure	fig
flange	flg
foot-pound	ft-lb
gallon	gal
gallons per hour	gph, or gal/hr
gallons per minute	gpm
gallons per second	gps
gram	g
grams per liter	g/L
Hertz	Hz
horsepower	hp or HP
hour	hr
human-machine interface	HMI
inch	in.
inches of mercury	in. Hg
inches water gage	in. w.g.
inch-pound	in.-lb
inside diameter	ID
iron pipe size	IPS
thousand pounds	kips
thousand pounds per square inch	ksi
kilovolt-ampere	kva
kilowatt	kw
kilowatt-hour	kwhr or kwh
linear foot	lin ft or LF
liter	L
Leadership in Energy and Environmental Design (USGBC)	LEED
maximum	max
mercury	Hg
milligram	mg
milligrams per liter	mg/l or mg/L
milliliter	ml
millimeter	mm
million gallons per day	mgd or MGD
million gallon	MG
minimum	min
national pipe threads	NPT

net positive suction head	NPSH
net positive suction head available	NPSHA
net positive suction head required	NPSHR
nitrogen oxide (total concentration of mono-nitrogen oxides such as nitric oxide (NO) and nitrogen dioxide (NO_2))	NOx
nominal pipe size	NPS
number	no.
operator interface terminal	OIT
ounce	oz
ounce-force	ozf
outside diameter	OD
parts per hundred	pph
parts per million	ppm
parts per billion	ppb
polyvinyl chloride	PVC
post meridian	p.m.
pound	lb
pounds per square inch	psi
pounds per square inch absolute	psia
pounds per square inch gauge	psig
pounds per square foot	psf
process control system	PCS
programmable logic controller	PLC
revolutions per minute	rpm
second	sec
specific gravity	sp gr, or SG
square	sq
square foot	sq ft, sf, or ft^2
square inch	sq in., or in^2
square yard	sq yd, or SY
standard	std
standard cubic feet per minute	scfm
total dynamic head	TDH
totally-enclosed fan-cooled	TEFC
volt	V
volts alternating current	vac
volts direct current	vdc
volatile organic compounds	VOC

1.5 REFERENCE STANDARDS

A. Refer to Article 3 of the General Conditions, as may be modified by the Supplementary Conditions, relative to reference standards and resolving discrepancies between reference standards and the Contract Documents. Provisions of reference standards are in effect in accordance with the Specifications.

B. Copies of Standards: Each entity engaged in the Work shall be familiar with reference standards applicable to its construction activity. Copies of applicable reference standards are not bound with the Contract Documents. Where reference standards are needed for a construction activity, obtain copies of standards from the publication source.

C. Abbreviations and Names: Where reference standards, specifications, codes, manuals, Laws or Regulations, or other published data of international, national, regional or local organizations are referred to in the Contract Documents, the organization issuing the standard may be referred to by their acronym or abbreviation only. The following acronyms or abbreviations that may appear in the Contract Documents shall have the meanings indicated below. Listing is alphabetical by acronym.

AA	Aluminum Association
AABC	Associated Air Balance Council
AAMA	American Architectural Manufacturers Association
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
ACS	American Chemical Society
ADSC-IAFD	International Association of Foundation Drilling.
AEIC	Association of Edison Illuminating Companies
AF&PA	American Forest and Paper Association
ABMA	American Bearing Manufacturers Association (formerly Anti-Friction Bearing Manufacturers Association (AFBMA))
AGMA	American Gear Manufacturers Association
AI	Asphalt Institute
AIA	American Institute of Architects
AIChE	American Institute of Chemical Engineers
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
ALSC	American Lumber Standards Committee
AMA	Acoustical Materials Association
AMCA	Air Movement and Control Association
AMP	National Association of Architectural Metal Manufacturers, Architectural Metal Products Division
ANSI	American National Standards Institute
APA	The Engineered Wood Association
APHA	American Public Health Association
API	American Petroleum Institute
AREA	American Railway Engineering Association
ARI	Air Conditioning and Refrigeration Institute

ASAE	American Society of Agricultural Engineers
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASNT	American Society for Non-Destructive Testing
ASQ	American Society for Quality
ASSE	American Society of Safety Engineers
ASTM	American Society for Testing and Materials
AWCI	Association of the Wall and Ceiling Industry
AWI	Architectural Woodwork Institute
AWPA	American Wood Protection Association
AWPI	American Wood Preservers Institute
AWS	American Welding Society
AWWA	American Water Works Association
BAAQMD	Bay Area Air Quality Management District
BHMA	Builders Hardware Manufacturers Association
BIA	Brick Industry Association
CBMA	Certified Ballast Manufacturers Association
CDA	Copper Development Association
CEMA	Conveyor Equipment Manufacturers Association
CGA	Compressed Gas Association
CISCA	Ceilings and Interior Systems Construction Association
CISPI	Cast Iron Soil Pipe Institute
CLFMI	Chain Link Fence Manufacturers Institute
CMAA	Crane Manufacturers Association of America
CRSI	Concrete Reinforcing Steel Institute
CSI	Construction Specifications Institute
DIN	Deutsches Institut fur Normung eV (German Institute for Standardization)
DIPRA	Ductile Iron Pipe Research Association
EJCDC	Engineers Joint Contract Documents Committee
EJMA	Expansion Joint Manufacturers Association, Inc.
ETL	Intertek Testing Services, Inc. (formerly ETL Testing Laboratories, Inc.)
FCC	Federal Communications Commission
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FM	Factory Mutual (FM Global)
FRPI	Fiberglass Reinforced Plastics Institute
FS	Federal Specification

GA	Gypsum Association
GANA	Glass Association of North America
HEW	United States Department of Health, Education and Welfare
HI	Hydraulic Institute
HMI	Hoist Manufacturers Institute
HUD	United States Department of Housing and Urban Development
IBC	International Building Code
ICC	International Code Council
ICEA	Insulated Cable Engineers Association
IEEE	Institute of Electrical and Electronics Engineers
IESNA	Illuminating Engineering Society of North America
IFI	Industrial Fasteners Institute
IRI	Industrial Risk Insurers
ISA	Instrumentation, Systems, and Automation Society (formerly Instrument Society of America)
ISO	Insurance Services Office
ISO	International Organization for Standardization
LPI	Lightning Protection Institute
MIA	Marble Institute of America
ML/SFA	Metal Lath/Steel Framing Association
MS	Military Specifications
MSS	Manufacturers' Standardization Society
MMA	Monorail Manufacturers Association
NAAMM	National Association of Architectural Metal Manufacturers
NACE	National Association of Corrosion Engineers
NAPF	National Association of Pipe Fabricators, Inc.
NARUC	National Association of Regulatory Utilities Commissioners
NBHA	National Builders Hardware Association
NBS	United States Department of Commerce, National Bureau of Standards
NCMA	National Concrete Masonry Association
NEC	National Electric Code
NELMA	Northeastern Lumber Manufacturers' Association
NEMA	National Electrical Manufacturers Association
NESC	National Electrical Safety Code
NETA	International Electrical Testing Association
NFPA	National Fire Protection Association
NFRC	National Fenestration Rating Council
NGA	National Glass Association
NHLA	National Hardwood Lumber Association
NHPMA	Northern Hardwood and Pine Manufacturers Association

NIST	United States Department of Commerce, National Institute of Standards and Technology
NLGA	National Lumber Grades Authority
NRCA	National Roofing Contractors Association
NRMCA	National Ready Mixed Concrete Association
NSF	National Sanitation Foundation
NSSGA	National Stone, Sand, and Gravel Association
NTMA	National Terrazzo and Mosaic Association
OSHA	Occupational Safety and Health Administration
PCA	Portland Cement Association
PCI	Precast/Prestressed Concrete Institute
PEI	Porcelain Enamel Institute
PFI	Pipe Fabrication Institute
PPI	Plastics Pipe Institute
PGMC	Primary Glass Manufacturers Council
PS	Product Standards Section, United States Department of Commerce
RCSC	Research Council on Structural Connections (part of AISC)
RMA	Rubber Manufacturers Association
SAE	Society of Automotive Engineers
SCAQMD	Southern California Air Quality Management District
SCPRF	Structural Clay Products Research Foundation
SCTE	Society of Cable Telecommunications Engineers
SDI	Steel Deck Institute
SDI	Steel Door Institute
SIGMA	Sealed Insulating Glass Manufacturing Association
SJI	Steel Joist Institute
SMACNA	Sheet Metal and Air Conditioning Contractor’s National Association
SPI	Society of the Plastics Industry
SPIB	Southern Pine Inspection Bureau
SSPC	Society for Protective Coatings
SWI	Steel Window Institute
TCNA	Tile Council of North America
TEMA	Tubular Exchanger Manufacturers Association
TIA/EIA	Telecommunications Industry Association/Electronic Industries Alliance
UL	Underwriters Laboratories, Inc.
USAB	United States Access Board
USDOE	United States Department of Energy
USEPA	United States Environmental Protection Agency
USGBC	United States Green Building Council
USGS	United States Geological Survey

USPHS	United States Public Health Service
WCLIB	West Coast Lumber Inspection Bureau
WCMA	Window Covering Manufacturers Association
WCMA	Wood Component Manufacturers Association
WDMA	Window and Door Manufacturers Association
WEF	Water Environment Federation
WWEMA	Water and Wastewater Equipment Manufacturers Association
WWPA	Western Wood Products Association

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

SECTION 01 45 23
INSPECTION SERVICES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Inspection services and references.

1.2 INSPECTION

A. OWNER will appoint an Inspector as a representative of the OWNER to perform inspections, tests, and other services in individual specifications Sections.

B. Alternatively, OWNER may appoint, employ, and pay an independent firm to provide additional inspection or construction management services as indicated in Section 01 45 29 TESTING LABORATORY SERVICES BY OWNER.

C. Reports will be submitted by the independent firm to the OWNER and ENGINEER indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.

D. Assist and cooperate with the Inspector.

E. CONTRACTOR shall furnish the Inspector with every reasonable facility to perform his work.

F. The Inspector shall have the authority to halt the construction of any portion of the work not meeting the requirements of the Plans and Specifications.

G. The City's normal work schedule is Monday through Friday from 8:00AM to 5:00PM. Notify the City at least twenty-four (24) hours in advance for any work scheduled outside the City's normal work schedule. The CONTRACTOR shall not commence any work unless inspection and/or testing have been pre-arranged with the City. All inspection and testing costs accumulated by the City for work outside the City's normal work schedule will be the responsibility of the CONTRACTOR.

H. Notify OWNER 24 hours prior to expected time for operations requiring services. Notify ENGINEER and independent firm when noted.

I. Sign and acknowledge report for Inspector.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

SECTION 01 45 53

CLEANING, TESTING, AND DISINFECTING HYDRAULIC STRUCTURES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:
1. This Section includes requirements for cleaning, testing, and disinfecting structures filled with fluid, such as tanks and flow conveyance channels. This Section does not cover manholes or utility chambers.
2. CONTRACTOR shall provide labor, material, tools, equipment, and incidentals as shown, specified, and required to clean, flush, disinfect, and test structures that will contain fluid.
3. The Work under this Section also includes providing all labor and materials required to prepare hydraulic structures for testing and disinfecting, conveying water to testing location, performing testing, and all labor and materials required to drain and dispose of water used for testing and disinfecting.

B. Hydraulic Structures Scheduled for Hydrostatic Testing and Disinfection: Clean, test, and disinfect interior surfaces of the following:

Hydraulic Structure Number	Hydraulic Structure Service and Location
1.	ClariCone® Clarifier No. 1
2.	ClariCone® Clarifier No. 2

C. Water for Testing:
1. Water for initial testing will be furnished by OWNER.
2. CONTRACTOR shall provide temporary piping, hoses, valves, backflow preventers, appurtenances, and services required for testing.
3. CONTRACTOR shall convey the water to testing location.
4. Water for testing may be withdrawn from:
   a. CONTRACTOR shall coordinate with OWNER for each site.
5. Maximum rate at which water may be withdrawn is 100 gpm. CONTRACTOR shall provide on withdrawal piping, downstream of backflow preventer, flow meter and valve to control rate of flow. Flow meter shall be calibrated within the past 12 months. Operation of flow meter shall be confirmed at the Site and witnessed by ENGINEER. Submit to ENGINEER certification of calibration.
6. Cost of water for re-testing shall be paid by CONTRACTOR to OWNER at OWNER's standard rates.

D. Provide chemicals required for disinfection and de-chlorination.

1.2 REFERENCES

A. Standards referenced in this Section are:
1. ACI 350.1, Tightness Testing of Environmental Engineering Concrete Structures, and Commentary.
2. ANSI/AWWA B100, Standard for Granular Filter Material.
3. ANSI/AWWA C652, Disinfection of Water-Storage Facilities.
4. ANSI/AWWA C653, Disinfection of Water Treatment Plants.
5. APHA/AWWA/WEF, Standard Methods for the Examination of Water and Wastewater.
6. NSF/ANSI 60, Drinking Water Treatment Chemicals – Health Effects.

1.3 TERMINOLOGY

A. The following words or terms are not defined but, when used in this Section, have the following meaning:

1. “Hydraulic structures” are tanks, channels, and other structures through which fluid is conveyed or that hold fluid. Hydraulic structures include structures open to the atmosphere and structures with closed tops, and structures that contain both fluid and gas. Hydraulic structures include wet wells, junction chambers, equalization tanks, storage tanks, treatment process tanks such as grit chambers, clarifiers, aeration tanks, filter beds, contact tanks, and other channels and tanks designated in this Section.

B. Excluded are structures that are to be cleaned or tested under other Specifications Sections.

1.4 QUALITY ASSURANCE

A. Qualifications:
   1. Testing Laboratory:
      a. Testing for bacteria and odor shall be by laboratory certified by authorities having jurisdiction.
      b. Testing laboratory shall comply with applicable requirements of ASTM E329.
      c. Testing equipment used by laboratory will be calibrated at intervals of not more than twelve months by device of accuracy traceable to one of the following: NIST SRM, ISO/IEC 17025, certified by state or local bureau of weights and measures, or values of natural physical constraints generally accepted in the engineering and scientific community.
   2. Backflow Preventer Technician:
      a. Backflow prevention technicians shall possess a valid certification as a backflow preventer technical issued by authority having jurisdiction.

B. Regulatory Requirements:
   1. Backflow preventers shall be tested by certified backflow prevention technician within 12 months of the date backflow preventer is used on the Project.
   2. TCEQ.

1.5 SUBMITTALS

A. Action Submittals: Submit the following:
   1. Product Data:
      a. Manufacturer’s published data on chemicals used for disinfection and de-chlorination.
      b. Evidence of NSF/ANSI 60 compliance for chemicals used in disinfection and de-chlorination.
   2. Procedure Submittals (including proposed plans for water conveyance, control, and disposal):
      a. Cleaning procedures.
      b. Hydrostatic testing procedures and equipment required, by hydraulic structure to be tested.
      c. Disinfection procedures and equipment required, by hydraulic structure to be tested.

B. Informational Submittals: Submit the following:
   1. Certifications:
      a. Certification of each backflow preventer proposed for use.
      b. Calibration certification for each flow meter proposed for use.
      c. Certification by CONTRACTOR and testing laboratory that tests were performed in compliance with referenced standards.
   2. Special Procedure Submittals:
      a. Time schedule for each test required.
      b. Procedure for disposal of chlorinated water, including proposed de-chlorination chemical and methods proposed for use.
      c. Not less than seven days prior to scheduled test, submit written notification of intent to test each hydraulic structure. Do not commence testing without obtaining ENGINEER’s acceptance of testing procedures, chemicals to be used, notification, and other required pre-test submittals.
   3. Field Quality Control Submittals:
      a. Results of each test.
      b. Chain of custody documentation for samples obtained for bacteriological and odor testing.
   4. Qualifications Statements:

a. Testing laboratory shall comply with applicable requirements of ASTM E329 and shall be certified by authorities having jurisdiction.
b. Testing equipment used by laboratory will be calibrated at intervals of not more than twelve months by device of accuracy traceable to one of the following: NIST SRM, ISO/IEC 17025, certified by state or local bureau of weights and measures, or values of natural physical constraints generally accepted in the engineering and scientific community.
c. Certified backflow preventer technician, when requested by ENGINEER.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Test Apparatus and Fluid Control Devices:
1. Provide temporary pumping, hoses, piping, instrumentation, and other materials, equipment, and items necessary to perform cleaning, testing, and disinfecting of hydraulic structures.
2. Provide and maintain temporary valves, plugs, bulkheads, and other fluid control devices suitable for the intended use and required cleaning, testing, and disinfecting.
3. Do not use materials or items that will injure or damage the Work.
4. Temporary backflow preventers shall be reduced pressure zone-type.

B. Chemicals:
1. Chemicals used for disinfection and de-chlorination shall be listed in NSF/ANSI 60.

PART 3 - EXECUTION

3.1 CLEANING

A. Cleaning Requirements:
1. Prior to testing, remove all scaffolding, planking, tools, rags, dirt, debris, foreign matter, and material not part of the permanent structure.
2. Thoroughly clean hydraulic structures' walls, floors, and operating equipment by sweeping, high-pressure wash, scrubbing, or other methods that will not injure the Work and existing facilities.
3. Remove from each hydraulic structure all water, dirt, and foreign material accumulated during cleaning. Provide temporary pumps, piping, and facilities as required to discharge water from the cleaning operation in manner acceptable to ENGINEER and in accordance with Laws and Regulations.
4. Do not proceed with testing until ENGINEER has accepted in the field results of cleaning.
5. Comply with Section 01 74 05, CLEANING, and this Section.

3.2 TESTING AND DISINFECTION – GENERAL

A. General Provisions Applicable to Cleaning and Testing of All Hydraulic Structures:
1. Separately test each hydraulic structure.
2. Hydraulic structures shall be free of visible leakage. Repair leaks in manner in accordance with the Contract Documents.
3. Interior Coatings and Finishes: Apply and cure protective coatings for concrete before starting disinfection.
4. Exterior Coatings and Finishes: Successfully test hydraulic structure, and obtain ENGINEER's acceptance of results of hydrostatic and air testing before applying exterior coating materials, such as damp proofing, and before installing masonry block veneer (if any).
5. Provide disinfection be as late as possible in the execution of the Work to provide maximum degree of sterility at the time the Work is placed into continuous service.
6. Bacteriological and Odor Testing – General:
a. Testing will be performed by certified testing laboratory retained by OWNER/ENGINEER.
b. Samples shall be obtained and transported by testing laboratory employee.
c. Reports of bacteriological testing shall indicate whether results comply with the Contract Documents and shall be acceptable to authorities having jurisdiction.

3.3 HYDROSTATIC TESTING OF HYDRAULIC STRUCTURES

A. Analysis of data from hydrostatic testing of hydraulic structures shall be by CONTRACTOR in accordance with ACI 350.1 and this Section. Provide materials, equipment, and labor to obtain test data.

B. Prior to starting hydrostatic testing, perform the following:
   1. All elements of the hydraulic structure that will resist pressure exerted by retained fluid shall be in place and at specified strength. Concrete shall be fully cured.
   2. Do not backfill structure walls before testing. Refer to Paragraph 3.2.A of this Section regarding application of exterior coatings to hydraulic structures.
   3. Valves, gates, blind flanges, and items other than concrete that control the flow of or otherwise retain fluid in the hydraulic structure shall be watertight for the hydrostatic test.
   4. Repair defective concrete.
   5. Advise ENGINEER and OWNER prior to commencing filling hydraulic structure for hydrostatic testing. Minimum time between notice and starting to fill for hydrostatic testing shall be in accordance with Paragraph 1.5.B.2 of this Section.
   6. Do not perform hydrostatic testing during period when ambient temperature is below 33 degrees F.
   7. Hydraulic structures with interior, wetted concrete surfaces shall remain filled with water for an initial adsorption period of not less than 48 hours. Following this initial period, provide make-up water to fill the hydraulic structure to specified water surface test elevation.

C. Required Water Surface Elevation for Hydrostatic Testing:
   1. Using the water source specified in this Section, fill hydraulic structures to specified water surface test elevation indicated in the following table:

Hydraulic Structure Number	Hydraulic Structure Service and Location	Water Surface Elevation for Testing
1.	ClariCone® Clarifier No. 1	Overflow
2.	ClariCone® Clarifier No. 2	Overflow

   2. Where test elevation is not specified or indicated and fluid level in the structure will normally be controlled by a weir, fill structure to elevation six inches below the weir crest.
   3. Where test elevation is not specified or indicated and structure does not have a flow control weir, test elevation shall be two feet below top of structure.

D. Filling Hydraulic Structures with Water:
   1. Fill the portion of the hydraulic structure to be tested at rate that does not exceed two vertical feet per hour.
   2. When potable water is used for testing, during filling provide temporary backflow preventer at the point where water is withdrawn from potable water system.

E. When water has reached specified test elevation and specified wetting period has elapsed, inspect hydraulic structure's exposed surfaces for leakage. Before starting hydrostatic testing, repair apparent leakage or weeping.

F. Test Duration: Hydrostatic test duration shall be determined by ENGINEER in accordance with ACI 350.1, and shall not be less than 24 hours.

G. Allowable Leakage:
   1. Leakage during the test period for hydraulic structures with vertical walls is defined as the volume calculated using the difference in water surface elevations at the start and end of the test period adjusted by adding the volume of precipitation and subtracting the volume of evaporation measured during the test period.
   2. Leakage during the test period for hydraulic structures with sloping walls is the quantity of water that must be supplied to the hydraulic structure or section thereof to maintain the water level within three inches of specified water surface test elevation during the hydrostatic test, plus the volume of water required to fill the hydraulic structure to specified water surface test elevation at conclusion of hydrostatic test, plus precipitation, minus evaporation.

3. For hydraulic structures with interior, wetted concrete surfaces that are not lined, allowable leakage is 0.075 percent of volume tested for each 24-hour period or portion thereof.
4. For hydraulic structures with interior wetted concrete surfaces lined with waterproof material, allowable leakage is 0.050 percent of volume tested for each 24-hour period or portion thereof.
5. No leakage is allowed for hydraulic structures with interior, wetted surfaces that do not include concrete.

H. Measurement Locations:
1. For hydraulic structures or portions thereof (when entire hydraulic structure is not tested as a whole) that are equal to or less than 1,000 square feet in water surface area, measure water level at not less than two locations approximately 180 degrees apart.
2. For hydraulic structures or portions thereof (when entire hydraulic structure is not tested as a whole) that are greater than 1,000 square feet in water surface area, measure water level at not less than four locations approximately 90 degrees apart.
3. Each measurement location shall be marked and given distinct reference number. Mark reference point on face of wall above test water surface in manner that will prevent movement or deterioration of reference point mark during the test. Remove reference point mark upon completion of testing and acceptance of testing results by ENGINEER.
4. Position the measurement locations to minimize effects of wave action and wind.

I. Evaporation and Precipitation Measurement:
1. Evaporation and Precipitation Measurement Vessels:
   a. In hydraulic structures open to atmosphere, a clear plastic, calibrated, open-topped container not less than 18-inch diameter and not less than 18 inches deep shall be provided at each measurement location.
   b. Before starting test, partially fill each evaporation-precipitation measurement vessel and float the vessel in the hydraulic structure, held in position near each measurement location.
   c. Calibration increments in container shall be 0.1-inch or less.
2. Position evaporation-precipitation measurement vessels so that vessels are not shaded by hydraulic structure’s walls, away from overhead items such as beams, pipes, and walkways.

J. Obtaining Test Measurements:
1. Do not start hydrostatic tests when severe weather conditions, such as heavy precipitation, high winds, major changes in average daily temperature, and other severe conditions are predicted for duration of test period.
2. Record the following measurements at each test location at start of test period and at 12-hour intervals thereafter:
   a. Distance from reference point elevation to actual water surface.
   b. Depth of water in evaporation-precipitation containers.
   c. Temperature of test water at point 18 inches below water surface.
   d. Temperature of water in evaporation-precipitation measurement vessels at mid-depth.
3. If actual water surface in hydraulic structure is subject to wave action at measurement location, record as data the average water surface elevation of wave oscillations.
4. Change in the water surface elevation at each measurement location shall be averaged and adjusted as follows:
   a. Total change in hydraulic structure’s water surface elevation shall be adjusted by average change in water surface elevation in evaporation-precipitation measurement vessels.
   b. Where averaged water temperature measurements vary by more than three degrees F from start to completion of test period, adjustment in test volume shall be determined by change of density of water resulting from change in the average water temperature.
5. Determination of Leakage:
   a. Hydraulic Structures with Vertical Walls: Leakage volume shall be the drop in water surface elevation measured during the test, multiplied by water surface area of hydraulic structure tested.
   b. Initial full volume shall include the volume of sloping tank bottoms, sump pits, and other features that contain water that is connected to the hydraulic structure during the hydrostatic test.
   c. Allowable leakage shall be determined by multiplying the initial full volume by the daily leakage allowance and by the leakage test time period in days.

K. Criteria for Acceptance:

1. Hydrostatic test will pass if measured leakage is less than allowable leakage and no leaks or weeping is observed.
2. If test becomes unreliable due to excessive precipitation, freezing, or other external factors, re-start and re-perform the test at no additional cost to OWNER.
3. If hydrostatic test fails, the hydraulic structure may be re-tested immediately without repairs. If subsequent hydrostatic test fails, repair probable areas of leakage and repeat the hydrostatic test.
4. Re-test hydraulic structure until it meets criteria specified for acceptance. Repair probable leakage areas before testing.

L. Reuse and Disposal of Water Used in Hydrostatic Tests:
1. Obtain ENGINEER's acceptance before water used in one hydrostatic test is pumped to a different hydraulic structure for reuse in subsequent test.
2. If chlorine residual in test water exceeds 0.5 mg/L, dechlorinate water used for hydrostatic testing to remove chlorine residual before discharging water to storm water drainage routes. Dechlorinate water using sodium bisulfite or other de-chlorination chemical acceptable to ENGINEER.

M. Hydraulic structure shall not be backfilled or have exterior coating applies (such as damp proofing) until ENGINEER accepts hydrostatic test results.

3.4 TESTING OF APPURTENANT PIPING

A. Test piping connected to hydraulic structures in accordance with the Contract Documents.

3.5 DISINFECTING HYDRAULIC STRUCTURES

A. Method:
1. Hydraulic structures to be disinfected shall be chlorinated by CONTRACTOR in accordance with one of the methods in ANSI/AWWA C652, unless otherwise specified or indicated in the Contract Documents.
2. Disinfect filters in accordance with Section 5 of ANSI/AWWA C653.

B. Disinfection Procedure:
1. Provide temporary taps, plugs, valves, drains, pumps, tanks, piping, facilities, and connections required to disinfect, dechlorinate, and remove chlorinated water in accordance with the Contract Documents.
2. Disinfect hydraulic structures immediately before each structure is placed into operation, to prevent facility from becoming contaminated after disinfection.
3. Use solution of water and liquid chlorine, calcium hypochlorite, or sodium hypochlorite for disinfecting hydraulic structures. Placement of solid chlorine, such as powder or tablets, inside hydraulic structures as means of disinfection is unacceptable.
4. Introduce chlorine solution into hydraulic structure in manner accepted by ENGINEER.
5. Add potable water to hydraulic structure with the chlorine solution. Introduce water to hydraulic structure through backflow prevention device.
6. De-chlorination:
   a. When Chlorination Water will be Discharged to Potable Water System: Upon completion of disinfection of each hydraulic structure, dechlorinate contents of hydraulic structure until chlorine residual equals the residual in local potable water system.
   b. If residual of local potable water system is not available, dechlorinate to achieve maximum chlorine residual of 0.5 mg/L.
   c. De-chlorination shall be in accordance with ANSI/AWWA C653.
7. Discharge of Chlorinated Water from Hydraulic Structure:
   a. For purposes of this Article, "chlorinated water" means water discharged from the hydraulic structure after disinfection, regardless of whether the water has been dechlorinated.
   b. Discharge of chlorinated water into a sewer will not be allowed without written approval of owner of wastewater conveyance system and wastewater treatment facility.
   c. Do not discharge chlorinated water onto roadways or into ditches, storm sewers, drainage culverts, streams, or wetlands.

C. Bacteriological and Odor Testing:
1. After disinfection is completed and before hydraulic structure is placed in service, test the hydraulic structure for odor and bacteria in accordance with ANSI/AWWA C652 and APHA/AWWA/WEF Standard Methods for Examination of Water and Wastewater.

2. Obtain from each disinfected hydraulic structure samples for bacteriological and odor testing as follows:
   a. Immediately After Completion of Disinfection: Not less than two samples.
   b. Twenty-four Hours after Obtaining First Set of Samples: Not less than two samples.
3. Sampling and testing for bacteriological and odor tests shall comply with Paragraph 3.2.A.6 of this Section. Test results shall indicate satisfactory results for bacteria and odor, in accordance with requirements of authority having jurisdiction, before hydraulic structure will be Substantially Complete.
4. Repeat the disinfection procedure at no additional cost to OWNER until bacteriological and odor test results are acceptable.

END OF SECTION

SECTION 01 57 33
SECURITY

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:
   1. This Section includes general requirements for security at the Site, including accessing the Site, securing the Work, temporary fencing, and other requirements.
   2. OWNER will provide security for access to the site but will not be responsible for any lost, stolen, or damaged items left at the site each day. CONTRACTOR shall be responsible for securing all equipment at the site.

1.2 SUBMITTALS

A. Informational Submittals: Submit the following:
   1. Employee Information: Submit to OWNER the following: do not submit to ENGINEER:
      a. Format of employee background data.
      b. Background data for employees to whom identification badges will be furnished.
      c. Updated listing of personnel to whom identification badges have been issued. Submit updated listing within 24 hours of a change in the list or change in an employee's Site access status.

1.3 CONTRACTOR'S SITE ACCESS AND SECURITY PROCEDURES

A. Comply with OWNER's requirements for parking and site access. CONTACTOR employees shall park in designated area allowed by OWNER.

B. Comply with OWNER's security procedures and access restrictions at the Site throughout the Project. Comply with the following:
   1. Personnel Identification and Background Checks:
      a. All CONTRACTOR personnel, including Subcontractors, Suppliers, and others associated with the Project shall wear, in a visible location, at all times at the Site a durable, waterproof badge with wearer's photograph, name, signature, and as applicable employee number; CONTRACTOR's name; employer (if other than CONTRACTOR), and Project name.
      b. Prior to issuing badge, submit to OWNER copy of background data sheet for each person to whom badge may be issued for OWNER acceptance; do not issue badge without OWNER acceptance of background data for that person.
      c. Submit for OWNER's acceptance the proposed format of employee background data sheet.
   2. General Provisions Regarding Personnel Identification:
      a. Prerequisites to Issuance of Personnel Identification Badges:
         1) Do not issue personnel identification badge until the person receiving the badge is documented by CONTRACTOR as:
            a) Being eligible to perform work in the jurisdiction where the Project is located.
            b) Has received all required safety instructions, training, and equipment.
            c) Is known to CONTRACTOR as being qualified to perform the Work to which the person will be assigned.
      b. Listing of Personnel to Whom Badges are Issued:
         1) Maintain and continuously update a listing or log of all personnel to whom personnel identification badges have been issued.
         2) Listing or log shall indicate each person's full name, home address, personal telephone number, employer name, and employer address and telephone number.
         3) Submit copy of listing or to OWNER in accordance with Article 1.2 of this Section.
   3. Parking:
      a. Do not park outside of designated CONTRACTOR parking area, which will be designated by OWNER. Prepare and maintain parking area as required.
      b. Personal vehicles are not allowed outside the CONTRACTOR parking area.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

SECTION 01 58 00
PROJECT IDENTIFICATION AND SIGNS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:
   1. CONTRACTOR shall furnish, install, and maintain temporary signage for Project identification and construction site information.
   2. Temporary signs required are indicated in Part 2 of this Section.
   3. Do not display any other temporary signs, other than those specified, without prior approved of OWNER.

1.2 QUALITY ASSURANCE

A. Qualifications:
   1. Sign Painter:
      a. Shall be a professional in the type of Work required, regularly engaged in work similar to that required.

1.3 SUBMITTAL

A. Action Submittals: Submit the following:
   1. Shop Drawings:
      a. Layout of each temporary sign, indicating layout, text, font, character size, graphics (if any), type and grade of materials, including sign board, trim supports, and bracing.
   2. Product Data:
      a. Specifications and product data for finishes proposed for use, when requested by ENGINEER.
   3. Samples: Submit color samples when requested by ENGINEER.

PART 2 - PRODUCTS

2.1 MATERIALS AND CONSTRUCTION

A. A. Performance Criteria:
   1. Temporary signs, including supports and bracing, shall withstand sustained winds of 75 miles per hour.

B. Temporary Signage Required: Provide the following temporary signs:
   1. Project Sign:
      a. Location: City of Alamo Water Treatment Plant ClariCone® Clarifier Rehabilitation and Protective Coating Phase 1B
      b. Shall conform to the configuration and details specified in the drawings
      c. Minimum Sign Board Dimensions: Eight (8) feet wide by Four (4) feet high.
      d. Mounting: Sign shall be mounted on two 4”x4”x12” posts. Posts shall be embedded a minimum of 3-feet below ground.
   2. Site Informational Signage:
      a. Provide temporary signage as required for construction site operations and controlling traffic at the construction site.

C. Materials:
   1. Sign Board:
      a. Signs shall be 3/4-inch thick, exterior-grade plywood, unless otherwise shown or indicated.
      b. Provide signs with trim, mitered on edges.
   2. Supports and Bracing:
      a. Provide supports and bracing as required to adequately support and brace temporary signs to comply with the performance criteria indicated in this Section.

D. Finishing:

1. Paint sign with exterior gloss-finish enamel, suitable for long-term exposure to sunlight without fading for the duration of the Project.

PART 3 - EXECUTION

3.1 INSTALLATION, MAINTENANCE, AND REMOVAL

A. Installation:
   1. Location of signs shall be as shown or indicated on the Contract Documents, or as directed by ENGINEER. Temporary signs shall be plainly visible to vehicular traffic.
   2. Install signs in a neat, professional, workmanlike manner to withstand the performance criteria indicated in this Section.

B. Maintenance:
   1. Maintain temporary signage so that signs are clean, legible, and upright.
   2. Cut grass, weeds, and other plants so that temporary signs are not covered or obscured.
   3. Repair and repaint damaged temporary signs.
   4. Relocate signs as required by progress of the Project.

C. Remove temporary signage prior to final inspection of the Work, or when directed by ENGINEER.

END OF SECTION

SECTION 01 64 00

MANUFACTURER'S FIELD SERVICES

PART 1 - GENERAL

1.1 SCOPE

A. This section shall govern the requirements established for MANUFACTURER's field services associated with the installation of equipment.

1.2 RELATED WORK

A. Section 01 33 00 – Submittal Procedures

B. Section 01 75 20 – Facility Start Up and Commissioning Requirements

1.3 DESCRIPTION OF WORK

A. CONTRACTOR shall arrange for and coordinate the MANUFACTURER's services as specified below.

1.4 SUBMITTALS

A. Training Plan (Pre Start Up and Post Start Up):
   1. Submit not less than 21 calendar days prior to start of equipment testing and revise as necessary for OWNER's acceptance.
   2. Submit MANUFACTURER's tentative training schedule, training plan, and contact person not less than 60 calendar days prior to commencement of any training.
      a. MANUFACTURER's proposed Training Plan shall include the elements presented in the Outline of Instruction Training Plan specified herein. Specific components and procedures shall be identified in the proposed Training Plan. Hands-on demonstrations planned for the instruction shall be described in the Training Plan. The MANUFACTURER shall indicate the estimated duration of each segment of the Training Plan.
         1) Outline of Instruction Training Plan:
            a) Equipment Description and Purpose
            b) Equipment operation
            c) Detailed component description
            d) Equipment preventative maintenance (PM)
            e) Equipment troubleshooting
            f) Equipment corrective maintenance
   3. Provide complete training materials, to include operation and maintenance data as required in this section to be retained by each trainee.

B. Quality Control Submittals:
   1. MANUFACTURER's Certificate of Proper Installation:
      a. When specified in the individual equipment specification sections or Equipment Schedule, submit certificate certifying:
         1) The product or system has been installed in accordance with the MANUFACTURER's recommendations, inspected by a MANUFACTURER's authorized representative, and serviced with the proper lubricants.
         2) Necessary safety equipment has been properly installed.
         3) Electrical and mechanical connections have been made meeting quality and safety standards, as required.
         4) Free from undue stress imposed by exterior connections or loads.
         5) Proper adjustments have been made and the product or system is ready for testing, facilities startup, operational test, and operation.
      b. Submit MANUFACTURER's Certificated of Proper Installation Form at end of this Specification.
   2. Certificate of Successful Equipment Testing: Prepare and submit where specified in individual equipment specification sections or Equipment Schedule, and upon completion of successful testing of respective equipment by the CONTRACTOR. See Certificate of Successful Equipment Testing Form at end of this specification.

3. Certificate of Successful Equipment System, subsystem or Component, Start Up Testing including Functional and Performance Tests: Prepare and submit where specified in individual equipment specification sections or Equipment Schedule, and upon completion of successful Start Up testing of respective equipment system, subsystem or component by the CONTRACTOR. See Certificate of Successful Equipment System, subsystem or component Start Up Testing Form at end of this Specification.
4. Certificate of qualification of MANUFACTURER's representative.

1.5 QUALIFICATION OF MANUFACTURER'S REPRESENTATIVE

A. Authorized representative of the MANUFACTURER, Certified by MANUFACTURER, factory trained, and experienced in the technical applications, installation, operation, and maintenance of respective equipment, system, subsystem, or component. Representative subject to acceptance by OWNER. No substitute representatives will be allowed unless prior written approval by OWNER has been given.

1.6 FULFILLMENT OF SPECIFIED MINIMUM SERVICES

A. Where MANUFACTURER's field services are specified, furnish MANUFACTURER's representative qualified to provide these services. Where time is necessary in excess of that stated in the Contract Documents for MANUFACTURER's field services, additional time required to perform the specified services shall be considered incidental work.

B. Coordinate and Schedule MANUFACTURER's field services to avoid conflicting with other field testing or other manufacturer's field services. Determine that all conditions necessary to allow successful testing have been met before scheduling field services.

C. Only those days of service approved by OWNER will be credited to fulfill the specified minimum services.

D. If specified, MANUFACTURER's services shall include as a minimum:
1. Assistance during installation to include observation, guidance, instruction of CONTRACTOR's assembly, erection, installation or application procedures.
2. Inspection, checking, and adjustment as required for equipment to function as warranted by MANUFACTURER and necessary to provide written approval of installation.
3. Revisiting the site as requited to correct problems and until installation and operation are acceptable to OWNER.
4. Resolution of assembly or installation problems attributable to, or associated with, respective MANUFACTURER's products, equipment, system, subsystem and components.
5. Assistance during testing and Start Up demonstration, and until product acceptance by the OWNER.
6. Training of OWNER's personnel in the operation and maintenance of respective products as required herein.
7. Completion of Manufacturer's Certificate of Proper Installation and applicable certificates of Successful Equipment Testing and Successful Equipment System, Subsystem or Component Start Up Testing, as required, including functional and performance tests service. (Forms at the end of this Specification)

1.7 TRAINING SCHEDULE

A. List specified equipment, system, subsystem, and component with respective MANUFACTURERs that require training services of MANUFACTURER's representatives and show:
1. Estimated dates for installation completion.
2. Estimate training dates to allow for multiple sessions when several shifts are involved.
3. Use Equipment Schedule as guidance and revise as needed to meet individual equipment specifications or MANUFACTURER's requirements for the preparation of estimated dates. Dates must be included as milestones on general project schedule, and must be coordinated as to allow completion of the project including Start Up Phase by Substantial Completion Date.

B. Adjust training schedule to allow full participation of appropriate OWNER and MANUFACTURER personnel at times of day specified by OWNER. Adjust schedule for interruptions in operability of equipment.

C. Training shall not proceed until all individual equipment, systems, subsystems or components have been installed and approved by the MANUFACTURER and completed the testing requirements indicated in specification 01 75 20.

D. Pre Start Up Training:
   1. Coordinate and furnish classroom training sessions with the OWNER's operating personnel and MANUFACTURER's representatives.
   2. Conduct training prior to System Start Up as defined in Specification Section 01 75 20.
   3. Provide Draft O&M Manuals.

E. Post Start Up Training:
   1. Coordinate and furnish on-site training sessions with the OWNER's operating personnel and MANUFACTURER's representatives.
   2. Conduct after System Start Up, but prior to Operational Testing of the equipment as defined in Specification Section 01 75 20.
   3. Provide Final O&M Manuals.

1.8 TRAINING OWNER'S PERSONNEL

A. Provide trained, articulate personnel acceptable to the OWNER to coordinate and expedite training, to be present during training coordination meetings with Owner and familiar with operation and maintenance manual information.

B. MANUFACTURER's Representative shall provide the number of days of training for equipment as indicated in the Equipment Schedule section. Operator training days shall be in addition to MANUFACTURER's field services required as indicated in the Equipment Schedule and submittals sections.
   1. All training will be performed during the operating staff's normal business hours and at other times requested and approved by the OWNER.

C. MANUFACTURER's representatives to provide detailed training to OWNER's personnel on operation and maintenance of specified product (equipment, system, subsystem, component) and as required in applicable Contract Documents. This includes operation, disassembly, and assembly of major equipment items, start up, shutdown, safety concerns, troubleshooting, installation, alignment, and recommended corrective and preventative maintenance procedures for all equipment.
   1. Training services include Pre Start Up classroom instruction and Post Start Up onsite hands-on instruction.
   2. MANUFACTURER's Representative shall be familiar with system operation and maintenance requirements for specified equipment, system, subsystem, or component.

D. Taping of Training Sessions: MANUFACTURER to videotape Pre Start and Post Start Up training sessions and furnish to the OWNER.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

MANUFACTURER'S CERTIFICATE OF PROPER INSTALLATION

CITY OF ALAMO EQPT SERIAL NO.:_____

EQPT TAG NO.:_____ EQPT/SYSTEM:_____

PROJECT NO.:_____ SPEC SECTION:_____

I hereby certify that the above-referenced equipment/system has been:

(Check Applicable)

- ☐ Installed in accordance with Manufacturer's recommendations.
- ☐ Inspected, checked, and adjusted.
- ☐ Serviced with proper initial lubricants.
- ☐ Electrical and mechanical connections meet quality and safety standards.
- ☐ All applicable safety equipment has been properly installed.

Comments:_____

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I, the undersigned Manufacturer's Representative, hereby certify that I am (i) a duly authorized representative of the manufacturer, (ii) empowered by the manufacturer to inspect, approve, and operate his equipment and (iii) authorized to make recommendationsrequired to assure that the equipment furnished by the manufacturer is complete and operational, except as may be otherwise indicated herein. I further certify that all information contained herein is true and accurate.

Date: _____

Manufacturer:_____

By Manufacturer's Authorized
Representative:_____
(Print Name/Authorized Signature)

CERTIFICATE OF SUCCESSFUL EQUIPMENT TESTING

CITY OF ALAMO EQPT SERIAL NO.:_____

EQPT TAG NO.:_____ EQPT/SYSTEM:_____

PROJECT NO.:_____ SPEC SECTION:_____

I hereby certify that the above-referenced equipment/system has been:

(Check Applicable)

- ☐ Serviced for proper operation, efficiency, and capacity.
- ☐ Field adjusted for secure satisfactory operation.
- ☐ Tested continuously under actual or simulated operationconditions.
- ☐ Tested over the full range of speed and pressure.
- ☐ Tested at every level of control.

Comments:_____

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I, the undersigned Contractor's Representative, hereby certify that I am (i) a duly authorized representative of the contractor, (ii) empowered by the manufacturer to inspect, approve, and operate his equipment and (iii) authorized to make recommendations required to assure that the equipment furnished by the manufacturer iscomplete and operations, except as may be otherwise indicated herein. I further certify that all information contained herein is true and accurate.

Date: _____

Contractor:_____

By Manufacturer/Supplier Authorized
Representative:_____
(Print Name/Authorized Signature)

By Contractor's Authorized
Representative:_____
(Print Name/Authorized Signature)

CERTIFICATE OF SUCCESSFUL EQUIPMENT SYSTEM, SUBSYSTEM OR COMPONENT START UP TESTING

CITY OF ALAMO EQPT SERIAL NO.:_____

EQPT TAG NO.:_____ EQPT/SYSTEM:_____

PROJECT NO.:_____ SPEC SECTION:_____

I hereby certify that the above-referenced equipment/system has been:
(Check Applicable)

- ☐ Demonstrate all operational features, instrumentation, and control functions while in automatic mode.
- ☐ Checked for proper installation, started and successfully tested.
- ☐ System has been functionally tested, and meets or exceeds specified performance requirements. (When complete system of one manufacturer.)
- ☐ System has been performance tested, and meets or exceeds specified performance requirements. (When complete system of one manufacturer.)
- ☐ Facility is ready for intended operation.

Comments:_____

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I, the undersigned Contractor's Representative, hereby certify that I am (i) a duly authorized representative of the contractor, (ii) empowered by the manufacturer to inspect, approve, and operate his equipment and (iii) authorized to make recommendations required to assure that the equipment furnished by the manufacturer is complete and operational, except as may be otherwise indicated herein. I further certify that all information contained herein is true and accurate.

Date: _____

Contractor:_____

By Manufacturer/Supplier Authorized Representative:_____
(If Required) (Print Name/Authorized Signature)

By Contractor's Authorized Representative:_____
(Print Name/Authorized Signature)

SECTION 01 65 00
PRODUCT DELIVERY REQUIREMENTS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:
   1. This Section includes general requirements for preparing for shipping, delivering, and handling materials and equipment to be incorporated into the Work.
   2. CONTRACTOR shall make all arrangements for transporting, delivering, and handling of materials and equipment required for prosecution and completion of the Work.
   3. When required, move stored materials and equipment without changes to the Contract Price or Contract Times.

1.2 SUBMITTALS

A. Refer to individual Specifications Sections for submittal requirements relative to delivering and handling materials and equipment.

1.3 PREPARING FOR SHIPMENT

A. When practical, factory-assemble materials and equipment. Mark or tag separate parts and assemblies to facilitate field-assembly. Cover machined and unpainted parts that may be damaged by the elements or climate with strippable, protective coating.

B. Package materials and equipment to facilitate handling, and protect materials and equipment from damage during shipping, handling, and storage. Mark or tag outside of each package and crate to indicate the associated purchase order number, bill of lading number, contents by name, OWNER's contract designation, CONTRACTOR name, equipment number, and approximate weight. Include complete packing lists and bills of materials with each shipment.

C. Protect materials and equipment from exposure to the elements and damage by climate, and keep thoroughly dry and dust-free at all times. Protect painted surfaces against impact, abrasion, discoloration, and other damage. Lubricate bearings and other items requiring lubrication in accordance with manufacturer's instructions.

D. Advance Notification of Shipments:
   1. Keep ENGINEER informed of delivery of all materials and equipment to be incorporated in the Work.
   2. Upon receipt of Supplier's advance notice of shipment, not less than seven days prior to delivery of materials and equipment, provide ENGINEER written notification of anticipated date and place of arrival of the following:
      a. On-site Sodium Hypochlorite Generation System Equipment.
      b. Metering Pumps.
      c. Brine and Sodium Hypochlorite Storage Tanks.
      d. Hydrogen Vent Blowers.

E. Do not ship materials and equipment until:
   1. Related Shop Drawings, Samples, and other submittals required by the Contract Documents have been approved or accepted (as applicable) by ENGINEER, including, but not necessarily limited to, all Action Submittals associated with the materials and equipment being delivered.
   2. Manufacturer's instructions for handling, storing, and installing the associated materials and equipment have been submitted to and accepted by ENGINEER in accordance with the Specifications.
   3. Results of source quality control testing (factory testing), when required by the Contract Documents for the associated materials or equipment, have been submitted to and accepted by ENGINEER.
   4. Facilities required for handling materials and equipment in accordance with the Contract Documents and manufacturer's instructions are in place and available.
   5. Required storage facilities have been provided.

1.4 DELIVERY

A. Scheduling and Timing of Deliveries:
   1. Arrange deliveries of materials and equipment in accordance with the Progress Schedule accepted by ENGINEER and in ample time to facilitate inspection and observation prior to installation.
   2. Schedule deliveries to minimize space required for and duration of storage of materials and equipment at the Site or other delivery location, as applicable.
   3. Coordinate deliveries to avoid conflicting with the Work and conditions at Site, and to accommodate the following:
      a. Work of other contractors and OWNER.
      b. Storage space limitations.
      c. Availability of equipment and personnel for handling materials and equipment.
      d. OWNER's use of premises.
   4. Deliver materials and equipment to the Site during regular working hours.
   5. Deliver materials and equipment to avoid delaying the Work and the Project, including work of other contractors, as applicable. Deliver anchor system materials, including anchor bolts to be embedded in concrete or masonry, in ample time to avoid delaying the Work.

B. Deliveries:
   1. Shipments shall be delivered with CONTRACTOR's name, Subcontractor's name (if applicable), Site name, Project name, and contract designation (example: "ABC Construction Co., City of Happy Beach, Idaho, Wastewater Treatment Plant Primary Clarifier Improvements, Contract 25, General Construction") clearly marked.
   2. Site may be listed as the "ship to" or "delivery" address; but OWNER shall not be listed as recipient of shipment unless otherwise directed in writing by ENGINEER.
   3. Provide CONTRACTOR's telephone number to shipper; do not provide OWNER's telephone number.
   4. Arrange for deliveries while CONTRACTOR's personnel are at the Site. CONTRACTOR shall receive and coordinate shipments upon delivery. Shipments delivered to the Site when CONTRACTOR is not present will be refused by OWNER, and CONTRACTOR shall be responsible for the associated delays and additional costs, if incurred.

C. Containers and Marking:
   1. Have materials and equipment delivered in manufacturer's original, unopened, labeled containers.
   2. Clearly mark partial deliveries of component parts of materials and equipment to identify materials and equipment, to allow easy accumulation of parts, and to facilitate assembly.

D. Inspection of Deliveries:
   1. Immediately upon delivery, inspect shipment to verify that:
      a. Materials and equipment comply with the Contract Documents and approved or accepted (as applicable) submittals.
      b. Quantities are correct.
      c. Materials and equipment are undamaged and of the required quality.
      d. Containers and packages are intact and labels are legible.
      e. Materials and equipment are properly protected.
   2. Promptly remove damaged materials and equipment from the Site and expedite delivery of new, undamaged materials and equipment, and remedy incomplete or lost materials and equipment. Furnish materials and equipment in accordance with the Contract Documents, to avoid delaying progress of the Work.
   3. Advise ENGINEER in writing when damaged, incomplete, or defective materials and equipment are delivered, and advise ENGINEER of the associated impact on the Progress Schedule.

1.5 HANDLING OF MATERIALS AND EQUIPMENT

A. Provide equipment and personnel necessary to handle materials and equipment, including those furnished by OWNER, by methods that prevent soiling or damaging materials and equipment and packaging.

B. Provide additional protection during handling as necessary to prevent scraping, marring, and otherwise damaging materials and equipment and surrounding surfaces.

C. Handle materials and equipment by methods that prevent bending and overstressing.

D. Lift heavy components only at designated lifting points.

E. Handle materials and equipment in safe manner and as recommended by the manufacturer to prevent damage. Do not drop, roll, or skid materials and equipment off delivery vehicles or at other times during handling. Hand-carry or use suitable handling equipment.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

SECTION 01 66 00
PRODUCT STORAGE AND HANDLING REQUIREMENTS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:
   1. This Section includes general requirements for storing and protecting materials and equipment.
   2. CONTRACTOR shall provide all labor, materials, tools, equipment, and incidentals to store and handle materials and equipment to be incorporated into the Work, and other materials and equipment at the Site.

1.2 STORAGE

A. Store and protect materials and equipment in accordance with manufacturer's recommendations and the Contract Documents.

B. General:
   1. CONTRACTOR shall make all arrangements and provisions necessary for, and pay all costs for, storing materials and equipment.
   2. Excavated materials, construction equipment, and materials and equipment to be incorporated into the Work shall be placed to avoid injuring the Work and existing facilities and property, and so that free access is maintained at all times to all parts of the Work and to public utility installations in vicinity of the Work.
   3. Store materials and equipment neatly and compactly in locations that cause minimum inconvenience to OWNER, facility manager, other contractors, public travel, and owners, tenants, and occupants of adjoining property.
   4. Arrange storage in manner to allow easy access for inspection by ENGINEER and Resident Project Representative (RPR).

C. Storage Location:
   1. Areas available at the Site for storing materials and equipment are shown or indicated in the Contract Documents, or as acceptable to ENGINEER.
   2. Restrictions:
      a. Do not store materials or equipment in structures being constructed unless approved by ENGINEER in writing.
      b. Do not use lawns or other private property for storage without written permission of the owner or other person in possession or control of such premises.

D. Protection of Stored Materials:
   1. Store materials and equipment to become OWNER's property to ensure preservation of quality and fitness of the Work, including proper protection against damage by freezing, moisture, and with outdoor ambient air high temperatures as high as required by manufacturer; temperature and humidity inside crates, containers, storage sheds, and packaging may be significantly higher than the outdoor ambient air temperature.
   2. Store in indoor, climate-controlled storage areas all materials and equipment subject to damage by moisture, humidity, heat, cold, and other elements, unless otherwise acceptable to OWNER.
   3. When placing orders to Suppliers for equipment and controls containing computer chips, electronics, and solid-state devices, CONTRACTOR shall obtain, coordinate, and comply with specific temperature and humidity limitations on materials and equipment, because temperature inside cabinets and components stored in warm temperatures can approach 200 degrees F.
   4. CONTRACTOR shall be fully responsible for loss or damage (including theft) to stored materials and equipment.
   5. Do not open manufacturer's containers until time of installation, unless recommended by the manufacturer or otherwise specified in the Contract Documents.
   6. Comply with requirements of Article 1.3 of this Section.

1.3 PROTECTION – GENERAL

A. Equipment to be incorporated into the Work shall be boxed, crated, or otherwise completely enclosed and protected during shipping, handling, and storage, in accordance with Section 01 65 00, Product Delivery Requirements.

B. Store all materials and equipment off the ground (or floor) on raised supports such as skids or pallets.

C. Protect painted surfaces against impact, abrasion, discoloration, and other damage. Painted equipment surfaces that are damaged or marred shall be repainted in their entirety in accordance with equipment manufacturer and paint manufacturer requirements, to the satisfaction of ENGINEER.

D. Protect electrical equipment, controls, and instrumentation against moisture, water damage, humidity, heat, cold, and dust. Space heaters provided in equipment shall be connected and operating at all times until equipment is placed in operation and permanently connected.

1.4 UNCOVERED STORAGE

A. The following types of materials may be stored outdoors without cover on supports so there is no contact with the ground:
   1. Reinforcing steel.
   2. Precast concrete materials.
   3. Structural steel.
   4. Metal stairs.
   5. Handrails and railings.
   6. Grating.
   7. Checker plate.
   8. Metal access hatches.
   9. Castings.
   10. Fiberglass items.
   11. Rigid electrical conduit, except PVC-coated conduit.
   12. Piping, except PVC or chlorinated PVC (CPVC) pipe.

1.5 COVERED STORAGE

A. The following materials and equipment may be stored outdoors on supports and completely covered with covering impervious to water:
   1. Grout and mortar materials.
   2. Masonry units.
   3. Rough lumber.
   4. Soil materials and granular materials such as aggregate.
   5. PVC and CPVC pipe.
   6. PVC-coated electrical conduit.
   7. Filter media.

B. Tie down covers with rope, and install covering properly sloped to prevent accumulation of water.

C. Store loose granular materials, with covering impervious to water, in well-drained area or on solid surfaces to prevent mixing with foreign matter.

1.6 FULLY PROTECTED STORAGE

A. Store all material and equipment not indicated in Articles 1.4 and 1.5 of this Section on supports in buildings or trailers that have concrete or wooden flooring, roof, and fully-closed walls on all sides. Covering with visquine plastic sheeting or similar material in space without floor, roof, and walls is unacceptable. Comply with the following:
   1. Provide heated storage for materials and equipment that could be damaged by low temperatures or freezing.
   2. Provide air-conditioned storage for materials and equipment that could be damaged by high temperatures or humidity.
   3. Protect mechanical and electrical equipment from being contaminated by dust, dirt, and moisture.
   4. Maintain humidity at levels recommended by manufacturers for electrical and electronic equipment.

B. Storage of Major Equipment:
   1. Storage of the equipment indicated below shall comply with this Paragraph 1.6.A of this Section:
      a. On-site Sodium Hypochlorite Generators and Rectifiers.
      b. Metering Pumps.
   2. Storage shall be in CONTRACTOR or Third-Party owned, bonded, insured, and climate-controlled warehouse.

1.7 MAINTENANCE OF STORAGE

A. On a scheduled basis, periodically inspect stored materials and equipment to ensure that:
   1. Condition and status of storage facilities is adequate to provide required storage conditions.
   2. Required environmental conditions are maintained on continuing basis.
   3. Materials and equipment exposed to elements are not adversely affected.

B. Mechanical and Electrical Equipment in Long-Term Storage:
   1. Mechanical and electrical equipment requiring long-term storage shall have complete manufacturer's instructions for servicing each item, with notice of enclosed instructions shown on exterior of container or packaging.
   2. Comply with manufacturer's instructions on scheduled basis.
   3. Space heaters that are part of electrical equipment shall be connected and operated continuously until equipment is placed in service and permanently connected.
   4. Affidavits:
      a. Submit to ENGINEER affidavit for each time that maintenance and inspection was performed on materials and equipment in long-term storage. Affidavit shall be signed by CONTRACTOR and entity performing the inspection and maintenance on the stored items.
      b. Affidavit shall indicate the date of the inspection, personnel and employer of each involved, specific stored items inspected, equipment condition, problems observed, problems corrected, maintenance tasks performed, conditions of storage environment, and other pertinent information.
      c. Affidavit shall include signed statement by the manufacturer of the item(s) indicating whether the storage conditions and tasks performed are suitable for continued compliance with manufacturer's warranties.

1.8 MICROPROCESSORS, PANELS, AND INSTRUMENTATION STORAGE

A. Store control panels, microprocessor-based equipment, electronics, and other devices subject to damage or decreased useful life because of temperatures below 40 degrees F or above 100 degrees F, relative humidity above 90 percent, or exposure to rain or exposure to blowing dust in climate-controlled storage space.

B. General:
   1. Storage shall be in CONTRACTOR or Third-Party owned, bonded, insured, and climate-controlled warehouse.
   2. OWNER and ENGINEER have the right to observe or inspect materials and equipment during normal working hours.
   3. Place inside each control panel or device a desiccant, volatile corrosion inhibitor blocks (VCI), moisture indicator, and maximum-minimum indicating thermometer.
   4. 4. Check panels and equipment not less than once per month. Replace desiccant, VCI, and moisture indicator as often as required, or every six months, whichever occurs first.
   5. Certified record of daily maximum and minimum temperature and humidity in storage facility shall be available for inspection by OWNER and ENGINEER. Certified record of monthly inspection, noting maximum and minimum temperature for month, condition of desiccant, VCI, and moisture indicator, shall be made available to OWNER and ENGINEER upon request.

C. Costs for storing climate-sensitive materials and equipment shall be paid by CONTRACTOR. Replace panels and devices damaged during storage, or for which storage temperatures or humidity range has been exceeded, at no additional cost to OWNER. Delays resulting from such replacement are causes within CONTRACTOR's control.

D. Do not ship control panels and equipment to the Site until conditions at the Site are suitable for installation, including slabs and floors, walls, roofs, and environmental controls. Failure to have the Site ready for installation shall not relieve CONTRACTOR from complying with the Contract Documents.

1.9 RECORDS

A. Keep up-to-date account of materials and equipment in storage to facilitate preparation of Applications for Payment, if the Contract Documents provide for payment for materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

SECTION 01 74 05
CLEANING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:
1. This Section includes requirements for keeping the Site free of accumulations of waste materials during construction ("progress cleaning") and cleaning for Substantial Completion and prior to final inspection (collectively, "closeout cleaning").
2. CONTRACTOR shall perform cleaning during the Project, including progress cleaning, upon completion of the Work, and as required by the General Conditions, as may be modified by the Supplementary Conditions, and this Section.
3. Maintain in a clean manner the Site, the Work, and areas adjacent to or affected by the Work.

1.2 REFERENCES

A. Standards referenced in this Section are:
1. NFPA 241, Safeguarding Construction, Alteration, and Demolition Operations.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION

3.1 PROGRESS CLEANING

A. General:
1. Clean the Site, work areas, and other areas occupied by CONTRACTOR not less than weekly. Dispose of materials in accordance with the General Conditions, as may be modified by the Supplementary Conditions, and the following:
a. Comply with NFPA 241 for removing combustible waste materials and debris.
b. Do not hold non-combustible materials at the Site more than three days if the temperature is expected to rise above 80 degrees F. When temperature is less than 80 degrees F, dispose of non-combustible materials within seven days of their generation.
c. Provide suitable containers for storage of waste materials and debris.
d. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately.

B. Site:
1. Keep outdoor, dust-generating areas wetted down or otherwise control dust emissions.
2. Not less than weekly, brush-sweep roadways and paved areas at the Site that are used by construction vehicles or otherwise affected by construction activities.

C. Work Areas:
1. Clean areas where the Work is in progress to maintain the extent of cleanliness necessary for proper execution of the Work.
2. Remove liquid spills promptly. Immediately report spills to OWNER, ENGINEER, and authorities having jurisdiction, in accordance with the Contract Documents and Laws and Regulations.
3. Where dust would impair proper execution of the Work, broom-clean or vacuum entire work area, as appropriate.
4. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

D. Installed Work:

1. Keep installed Work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of material or equipment installed, using only cleaning agents and methods specifically recommended by material or equipment manufacturer. If manufacturer does not recommend specific cleaning agents or methods, use cleaning agents and methods that are not hazardous to health and property and that will not damage exposed surfaces.

E. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration until Substantial Completion.

F. Cutting and Patching:
1. Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, trailings and cuttings, and similar materials.
2. Thoroughly clean piping, conduits, and similar features before applying patching material, paint, or other finishing materials. Restore damaged coverings on piping, ducting, and similar items to its pre-construction condition.

G. Cleaning of Hydraulic Structures: Clean hydraulic structures that will contain fluid, such as tanks and channels, in accordance with this Section and Section 01 45 53, Cleaning, Testing, and Disinfecting Hydraulic Structures.

H. Waste Disposal:
1. Properly dispose of waste materials, surplus materials, debris, and rubbish off the Site.
2. Do not burn or bury rubbish and waste materials at the Site.
3. Do not discharge volatile or hazardous substances, such as mineral spirits, oil, or paint thinner, into storm sewers or sanitary sewers.
4. Do not discharge wastes into surface waters or drainage routes.
5. CONTRACTOR is solely responsible for complying with Laws and Regulations regarding storing, transporting, and disposing of waste generated by CONTRACTOR’s operations or brought to the Site by CONTRACTOR.

I. During handling and installation of materials and equipment, clean and protect construction in progress and adjoining materials and equipment already in place. Apply protective covering where required for protection from damage or deterioration, until Substantial Completion.

J. Clean completed construction as frequently as necessary throughout the construction period.

3.2 CLOSEOUT CLEANING

A. Complete the following prior to requesting inspection for Substantial Completion:
1. Clean and remove from the Site rubbish, waste material, debris, and other foreign substances.
2. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
3. Hose-clean sidewalks and loading areas.
4. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
5. Leave surface waterways, drainage routes, storm sewers, and gutters open and clean.
6. Repair pavement, roads, sod, and other areas affected by construction operations and restore to specified condition; if condition is not specified, restore to pre-construction condition.
7. Clean exposed exterior and interior hard-surfaced finishes to dirt-free condition, free of spatter, grease, stains, fingerprints, films, and similar foreign substances.
8. Clean, wax, and polish wood, vinyl, and painted floors.
9. Remove debris and surface dust from limited-access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, and similar spaces.
10. In unoccupied spaces, sweep concrete floors broom clean.
11. Clean transparent materials, including mirrors and glazing in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.
12. Remove non-permanent tags and labels.
13. Surface Finishes:
    a. Touch-up and otherwise repair and restore chipped, scratched, dented, or otherwise marred surfaces to specified finish and match adjacent surfaces.
    b. Do not paint over “UL” or similar labels, including mechanical and electrical nameplates.

14. Wipe surfaces of mechanical and electrical equipment, and similar equipment. Remove excess lubrication, paint, and mortar droppings, and other foreign substances.
15. Clean plumbing fixtures to sanitary condition, free of stains, including stains resulting from water exposure.
16. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
17. Clean lighting fixtures, lamps, globes, and reflectors to function with full efficiency. Replace temporary lamps provided in permanent fixtures. Replace existing lighting fixture components that are burned out or noticeably dimmed from use during construction. Replace defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
18. Leave the Site clean, and in neat, orderly condition, satisfactory to OWNER and ENGINEER.

B. Complete the following prior to requesting final inspection:
   1. Following completion of the Work on the “punch list” of Work uncompleted at Substantial Completion, clean in accordance with Paragraph 3.2.A of this Section.

END OF SECTION

SECTION 01 75 20
FACILITY STARTUP AND COMMISSIONING REQUIREMENTS

PART 1 - GENERAL

1.1 SCOPE

A. This section covers starting of systems for all items of mechanical, electrical, and control equipment. Additional requirements may be specified in individual equipment section.

B. Procedures and actions required of the CONTRACTOR, which are necessary to achieve a Letter of Substantial Completion
   1. Pre-Start Up (Construction Phase)
      a. Factory Tests
      b. Field Test
      c. Test Log Submittals
   2. System Start Up
      a. Operational Readiness Evaluation Tests
      b. Performance Tests

C. Procedures and actions required of the CONTRACTOR, which are necessary to achieve a Memo of Final Acceptance.
   1. Successful completion of 30-day Operational Test.

1.2 RELATED WORK

A. Section 01 33 00 – SUBMITTAL PROCEDURES.

B. Section 01 64 00 – MANUFACTURER'S SERVICES.

1.3 DEFINITIONS

A. System: the overall process, or a portion thereof, that performs a specific function. A system may consist of the entire facility or two or more subsystems as well as two or more types of equipment or components.

B. Pre-Start Up: The period of time of unspecified duration during construction and installation - activities which the CONTRACTOR, with assistance from MANUFACTURER's Representatives, performs the following sequence:
   1. Finishes construction work so that the Project has reached a tentative state of Substantial Completion pending completion of the System Start Up.
   2. MANUFACTURER's Field Services
      a. Equipment and Pre-Start Up Assistance
      b. Installation and Equipment Testing Certifications
      c. Pre-Start Up Training

C. System Start Up: A period of time of specified duration, following the Pre-Start Up Period, during which the CONTRACTOR initiates process flow through the facility and operates the facility without exceeding specified downtime limitations, to prove the functional integrity of the mechanical and electrical equipment and components and the control interfaces of the respective equipment and components comprising the facility as evidence of Substantial Completion. The following test activities must be executed by the CONTRACTOR with assistance from the MANUFACTURER's Representative as needed.
   1. Operational Readiness Evaluation Tests: Test or tests performed by the CONTRACTOR in the presence of the OWNER to demonstrate that installed equipment, system, subsystem, or components meet MANUFACTURER's installation and adjustment requirements; and other requirements specified including, but not limited to noise, vibration, alignment, speed, proper electrical and mechanical connections, thrust restraint, proper rotation, and initial servicing.
   2. Performance Test: A test performed by the CONTRACTOR in the presence of the OWNER and after all required functional tests specified, to demonstrate and confirm that the equipment, system, subsystem, or components meet the specified performance requirements.

3. MANUFACTURER's Field Services
   a. Equipment and System Start Up Assistance
   b. Equipment, System, Subsystem, or Component Start Up Testing Certification.
   c. Post Start Up Training

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 DESCRIPTION OF WORK

A. All items of mechanical and electrical equipment shall be tested for proper operation, efficiency, and capacity. All required adjustments, tests, operation checks, and other Pre-Start Up activity shall be provided.

B. Equipment List – refer to Plans.

3.2 PRE-START UP (CONSTRUCTION PHASE)

A. FACTORY TESTS
   1. All items of equipment so specified shall be tested at the point of manufacture facility at the CONTRACTOR's expense. Not less than seven (7) certified copies of the test results shall be submitted for review.
   2. Coordinate with the OWNER and CONSULTANT for factory test schedule if §witness testing of equipment is specified in individual specification of the equipment.
   3. Equipment shall not be shipped until the CONSULTANT has reviewed the test results and notified the CONTRACTOR in writing that the equipment is acceptable for shipment. Such acceptance, however, shall not be considered as final acceptance, which will only be made on the basis of the test results of the equipment after installation.

B. FIELD TESTS
   1. All items of mechanical, electrical, and control equipment shall be tested by the CONTRACTOR after installation for proper operation, efficiency, and capacity. The CONTRACTOR's test operation of each piece of equipment shall continue for not less than eight (8) hours without interruption. All moving parts of equipment and machinery shall be carefully tested for operation, and adjusted so all parts move freely and function to secure satisfactory operation. All parts shall operate satisfactorily in all respects, under continuous full load and in accordance with the specified requirements, for the full duration of the eight-hour test period. If necessary, corrections or repairs shall be made and the full eight-hour test operation, as specified, shall be completed after all parts operate satisfactorily.
   2. The CONTRACTOR shall furnish and pay for all power, water, fuels, oil, grease, chemicals, and auxiliaries that are required for conducting the CONTRACTOR's testing of the equipment for proper operation, efficiency, and capacity during Pre-Start Up.
   3. Field Tests of all process and pumping equipment, drive motors, including auxiliaries shall be made in accordance with the appropriate and approved test codes of the American Society of Mechanical Engineers (ASME), Hydraulic Institute Standards, National Electrical Manufacturers Association (NEMA), and Institute of Electrical and Electronics Engineers (IEEE).
   4. Field testing shall be conducted before the Work is ready for System Start Up and is substantially complete, so each item of equipment is ready for integrated operation with other equipment at the facility. Testing, measuring, and calibrating procedures shall be submitted to the CONSULTANT for review and acceptance prior to field testing of equipment. The facility control system must be in place and MANUFACTURER's Certificate of Proper Installation must be completed prior to equipment tests.

5. All equipment shall be tested continuously under actual or simulated operating conditions. Equipment shall be tested over the full range of speed, capacity, and pressure. Equipment shall also be tested at every level of control. Valves shall be throttled as required to simulate the full operating range. Curves shall be developed from the test data and compared to the specified performance criteria. The CONTRACTOR shall provide all appurtenances as required, but not limited to flow meters for liquid and gas flow pressure gauges and throttling valves, to verify performance. The CONTRACTOR shall be fully responsible for the operation and maintenance of the equipment during Pre-Start Up. During testing, pressure, flow rate, amperage, voltage, vibration, equipment temperature, ambient temperature, tank level and the level of all water surfaces shall be measured. The MANUFACTURER's representative shall make all necessary field adjustments and correct defects in materials or workmanship during this test period. The equipment shall be properly filled, by the CONTRACTOR, with oil and grease.
6. The period of inspection, Pre-Start Up operation, and field adjustment shall be as required to achieve satisfactory installation and operation of the items furnished.

C. TEST LOG SUBMITTALS
1. MANUFACTURER's Certificate of Proper Installation – Utilize the MANUFACTURER's Certificate of Proper Installation Form from Section 01 64 00 – MANUFACTURER'S SERVICES, supplemented as necessary, to document results, problems, and conclusions.
2. Equipment Test – Test report and certification of test for each piece of equipment, system, subsystem, or component specified. See Section 01 64 00 – MANUFACTURER'S
3. I/O Loop Test – Third Party independent Test Agency
4. Equipment Calibration Sheets – Certifications of calibration for testing equipment and permanent equipment.
5. Electrical Testing – Third Party Independent Test Agency
6. Certificate of Successful Equipment Testing – Utilize the Certificate of Successful Equipment Testing Form from Section 01 64 00 – MANUFACTURER'S SERVICES, supplemented as necessary, to document results, problems, and conclusions.

D. ADDITIONAL PRE-START UP ACTIVITIES
1. General activities include:
   a. Cleaning
   b. Removing temporary protective coatings.
   c. Flushing and replacing greases and lubricants, where required by the MANUFACTURER.
   d. Lubrication.
   e. Check shaft and coupling alignments and reset where needed.
   f. Check and set motor, pump and other equipment rotation, safety interlocks, and belt tensions.
   g. Check and correct if necessary leveling plats, grout, bearing plates, anchor bolts, fasteners, and alignment of piping which may put stress on pumping equipment connected to it.
   h. All adjustments required.
2. Minimum activities include:
   a. Bearings and Shafts
      1) Inspect for cleanliness, clean, and remove foreign materials.
      2) Verify alignment.
      3) Replace defective bearings, and those which run rough or noisy.
      4) Grease as necessary, in accordance with MANUFACTURER's recommendations.
   b. Drives
      1) Adjust tension in V-belt drives, and adjust vari pitch sheaves and drives for proper equipment speed (if necessary).
      2) Adjust drives for alignment.
      3) Clean and remove foreign materials before starting operation.
   c. Motors
      1) Check each motor for comparison to amperage nameplate value.
      2) Correct conditions which produce excessive current flow, and which exist due to equipment malfunction.
      3) Check each motor for proper rotation.
   d. Pumps
      1) Check glands and seals for cleanliness and adjustment before running pump.
      2) Inspect shaft sleeves for scoring.

3) Inspect mechanical faces, chambers, and seal rings, and replace if defective.
4) Verify that piping system is free of dirt and scale before circulating liquid through the pump.

e. Valves
1) Open and close valves by hand and operate to check for binding, interference, or improper functioning.
2) Inspect both manual and automatic control valves, clean bonnets, and stems.
3) Tighten packing glands to assure no leakage, but permit valve stems to operate without galling.
4) Replace packing in valves to retain maximum adjustment after system is judged complete.
5) Replace packing on any valve which continues to leak.
6) Remove and repair bonnets which leak.
7) Coat packing gland threads and valve stems with an appropriate surface preparation after cleaning.

f. Verify that control valve seats are free from foreign material, and are properly positioned for intended service.
g. Tighten all pipe joints after system has been field tested. Replace gaskets which show any sign of leaking after tightening.
h. Inspect all joints for leakage.
i. Promptly remake each joint which appears to be faulty, do not wait for rust to form.
j. Clean threads on both parts, apply compound and remake joints.
k. Clean strainers, dirt pockets, orifices, valve seats, and headers in fluid system, to assure freedom from foreign materials.
l. Open traps and air vents where used, remove operating elements. Clean thoroughly, replace internal parts and put back in readiness mode.
m. Remove rust, scale and foreign materials from equipment and renew defaced surfaces.
n. Set and calibrate permanent equipment.
o. Check each electrical control circuit to assure that operation complies with Contract Documents and requirements to provide desired performance.
p. Inspect each pressure gage and thermometer for calibration. Replace items which are defaced, broken, or which read incorrectly.
q. Repair damaged insulation.
r. Vent gases trapped in any part of systems. Verify that liquids are drained from all parts of gas or air system.
s. Calibrate testing equipment for accurate results.
t. Check power supply to electric-powered equipment for correct voltage.
u. Adjust clearances and torque.
v. Testing piping for leaks.
w. Balance HVAC systems, measuring airflow (cfm) static pressure, and component pressure losses. Furnish report documenting results of balancing.
x. Equipment and electrical tagging complete.
y. All spare parts and special tools deliver to OWNER.

3.3 SYSTEM START UP

A. SUBMITTALS
1. Administrative Submittals.
a. Operational and Performance test schedules.
b. Plan for equipment, systems, subsystem, or component at least twenty-one (21) calendar days prior to start of related testing. Include test plan, procedures, and log format.
c. Schedule and plan of System Start Up activities at least thirty (30) calendar days prior to commencement.
2. Certificate of Successful Equipment, System, Subsystem, or Component Start Up Testing – Utilize the Certificate of Successful Equipment, system, subsystem, or component Start Up Testing Form from Section 01 66 00 – MANUFACTURER'S SERVICES, supplemented as necessary, to document functional and performance procedures, results, problems, and conclusions.

B. CONTRACTOR FACILITY START UP RESPONSIBILITIES
1. General

2. Prepare and pretest all equipment insofar as possible to check its ability for sustained operation, including inspections and adjustments by manufacturer's servicemen.
3. Be responsible for System Start Up of all facilities constructed under this Contract.
4. Perform Work for tests specified.
5. Demonstrate proper installation, adjustment, function and performance of equipment, systems, subsystem, or components, control devices, and required interfaces individually and in conjunction with process instrumentation and control system.
6. The CONTRACTOR shall furnish and pay for all power, water, fuels, oil, grease, chemicals, and auxiliaries that are required for conducting the CONTRACTOR's testing of the equipment for proper operation, efficiency, and the capacity during System Start Up.

C. OWNER'S FACILITY START UP RESPONSIBILITIES
   1. General
      a. Review CONTRACTOR's test plan and schedule.
      b. Witness each functional and performance tests.
      c. Provide assistance and support for startup and performance testing.
      d. d. OWNER will operate existing facilities not part of the construction contract.

D. START UP AND TESTING PREPARATION
   1. General
      a. Complete Work associated with the equipment, system, subsystem, or components and related processes before testing, including related MANUFACTURER's representative services.
      b. Furnish qualified MANUFACTURER's representatives when required to assist in testing.
      c. Utilize the certificate of Successful Equipment, System, Subsystem, or component Start Up Testing Form from Section 01 66 00 – MANUFACTURER'S SERVICES, supplemented as necessary, to document functional and performance procedures, results, problems, and conclusions.
      d. Schedule and attend pretest (functional and performance) meetings related to test schedule, plan of test, materials, chemicals, and liquids required, facilities' operations interface, OWNER involvement.
      e. Designate and furnish one or more persons to be responsible for coordinating and expediting CONTRACTOR's System Start Up duties. The person or persons shall be present during System Start Up meeting and shall be available at all times during the System Start Up period.
      f. Provide temporary valves, gauges, piping, test equipment and other materials and equipment required to conduct testing.
   2. Cleaning and Checking: Prior to starting functional testing.
      a. Calibrate testing equipment for accurate results.
      b. Inspect and clean equipment, devices, connected piping, and structures so they are free of foreign material.
      c. Lubricate equipment in accordance with Manufacturer's instructions.
      d. Turn rotating equipment by hand and check motor-driven equipment for correct rotation.
      e. Open and close valves by hand and operate other devices to check for binding, interference, or improper functioning.
      f. Check power supply to electric-powered equipment for correct voltage.
      g. Adjust clearances and torque.
      h. Test piping for leaks.
      i. Obtain completion of applicable portions of MANUFACTURER's Certificate of Proper Installation in accordance with Section 01 66 00 – MANUFACTURERS SERVICES.
   3. Ready-to-test determination will be by OWNER based at least on the following:
      a. Notification by CONTRACTOR of equipment and system readiness for testing.
      b. Acceptable Test Log Submittal to OWNER.
      c. Acceptable testing plan.
      d. Acceptable Final Draft Operation and Maintenance Manuals.
      e. Receipt of MANUFACTURER's Certificate of Proper Installation, as required.
      f. Receipt of Certificate of Successful Equipment Testing, as required.
      g. Adequate completion of Work adjacent to, or interfacing with, equipment to be test.
      h. Availability and acceptability of MANUFACTURER's representative, when specified, to assist in testing of respective equipment, and satisfactory fulfillment of other specified MANUFACTURERS' responsibilities.
      i. Equipment and electrical tagging complete.
      j. All spare parts and special tools delivered to and become property of the OWNER.

E. OPERATIONAL READINESS EVALUATION TEST-GENERAL
1. Begin testing at a time mutually agreed upon by the OWNER and CONTRACTOR.
2. OWNER and MANUFACTURER's Representative will be present during test. Notify in writing MANUFACTURER's representative(s) at least twenty-one (21) calendar days prior to scheduled date of operational readiness evaluation test.
3. Separate items of equipment demonstrated to function properly during subsystem testing may require no further Functional test if documentation of subsystem testing is acceptable to OWNER.
4. Conduct functional test as specified for each equipment, system, subsystem, on component for a minimum period of seventy-two (72) hours.
5. 5. Demonstrate all operational features and instrumentation and control functions while in automatic mode.
6. If, in OWNER's opinion, functional test results do not meet requirements specified, the systems will be considered as nonconforming.
7. Performance testing shall not commence until the equipment, system, subsystem, or components meet the specified functional tests.

F. PERFORMANCE TEST-GENERAL
1. Begin testing at a time mutually agreed upon by the OWNER and CONTRACTOR.
2. OWNER will be present during test. Notify in writing MANUFACTURER's representative(s) at least twenty-one (21) days prior to schedule date of performance tests.
3. Conduct performance test as specified for each equipment, system, subsystem, or component for a minimum period of eight (8) consecutive hours.
4. Unless otherwise indicated, furnish all labor, materials, and supplies for conducting the test and taking all samples and performance measurements.
5. Prepare performance test report summarizing test method. Include test logs, pertinent calculations, and CONTRACTOR's Certificate of Successful Equipment, System, Subsystem, or Component Start Up Testing.

G. SYSTEM START UP
1. General.
   a. Attend planning meetings and arrange for attendance by key major equipment MANUFACTURER representatives as required by the Contract Documents.
   b. Designate one or more persons on the CONTRACTOR's staff to be able for coordinating and expediting CONTRACTOR'S System Start Up duties.
   c. When System Start Up has commenced, schedule remaining Work so as not to interfere with or delay the completion of System Start Up.
   d. Support System Start Up activities with adequate staff to prevent delays. Such staff shall include, but not be limited to, equipment, system, subsystem, or component, MANUFACTURER's representatives, electricians, instrumentation and control personnel, millwrights, pipe fitters, and plumbers.
   e. Furnish and coordinate specified MANUFACTURER's System Start Up services.
2. System Start Up Testing
   a. System Start Up of the entire system or any portion thereof requires the coordinated operation of the facilities by the CONTRACTOR, SUBCONTRACTORs, OWNER's operating personnel, CONSULTANT, and MANUFACTURER's representatives.
   b. System Start Up of the entire facility or any portion thereof shall be considered complete when, in the opinion of the OWNER, the facility or designated portion has operated in the manner intended without interruption. This includes any training, functional or performance test periods specified herein.
   c. An interruption may include but is not limited to any of the following events.
      1) Failure of CONTRACTOR to maintain qualified onsite System Start Up personnel as scheduled.
      2) Failure to meet specified functional or performance tests.
      3) Failure of any critical equipment, system, subsystem, or component that is not satisfactorily corrected within two (2) hours after failure.
      4) Failure of any non-critical equipment, system, subsystem, component that is not satisfactorily corrected within four (4) hours after failure.
      5) As may be determine by OWNER.
   d. An interruption will require the System Start Up, then in progress, to be stopped and restarted after corrections are made.
3. Startup Test Reports: As applicable to the equipment furnished, certify in writing that:
   a. Hydraulic structures piping systems, and valves have been successfully tested.

b. Equipment, systems, subsystems, or component have been checked for proper installation, started, and successfully tested to indicate that they are operations.
c. Equipment, systems, subsystems, or components are capable of performing their intended functions, including fully automatic.
d. Facilities are ready for intended operation.
e. Final O&M manuals have been submitted and approved by OWNER.

3.4 OPERATIONAL TEST

A. As a condition of Final Acceptance, after all functional and performance tests and the entire system is safe and ready to operate, the OWNER will test all constructed facilities using all specified systems in combination with each other for a period of thirty (3) days continuous operation (either actual or simulated) without interruption due to malfunctions of constructed facilities. All defects of material or workmanship which appear during this test period shall be corrected by the CONTRACTOR. After such corrections are made, the thirty (30) day test shall be restarted at zero and run again before final acceptance of the equipment. The time need not be continuous based on malfunctions of associated existing facilities.

B. The OWNER will supply all power, water, and operating personnel required for this final operational test. CONTRACTOR shall supply all oil, fuels, grease, chemicals, and auxiliaries required for the 30-day operational test.

C. Each MANUFACTURER who furnishes equipment that requires factory trained service personnel shall adjust the equipment until the operational tests have been met and the results of the operational tests have been accepted by the ENGINEER.

D. CONTRACTOR'S Representative shall be on site for the thirty (30) day operational test for assisting in the operation and maintenance of the System.

END OF SECTION

SECTION 01 77 19
CLOSEOUT REQUIREMENTS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:
   1. Section Includes.
      a. Substantial Completion.
      b. Final inspection.
      c. Request for final payment and acceptance of the Work.

1.2 SUBSTANTIAL COMPLETION

A. Substantial Completion – General:
   1. Prior to requesting Substantial Completion, perform the following for the substantially completed Work:
      a. Materials and equipment for which Substantial Completion is requested shall be fully ready for their intended use, including full operating and monitoring capability in automatic and manual modes.
      b. Complete field quality control Work, including testing at the Site, indicated in Specifications Sections for individual materials and equipment items. Submit results of, and obtain ENGINEER's acceptance of, field quality control tests required by the Contract Documents.
      c. Startup and checkout shall be completed in accordance with the requirements of the Specifications for the various materials and equipment in the substantially completed Work.
      d. Cleaning for Substantial Completion shall be completed in accordance with Section 01 74 05, Cleaning.
      e. Submit and obtain ENGINEER's acceptance of final operations and maintenance manuals.
      f. Obtain and submit to ENGINEER all required permits, inspections, and approvals of authorities having jurisdiction for the substantially completed Work to be occupied and used by Owner.
      g. Complete other tasks that the Contract require be completed prior to Substantial Completion.
   2. Procedures for requesting and documenting Substantial Completion are in the General Conditions, as may be modified by the Supplementary Conditions.
   3. Sample letter for CONTRACTOR to request inspection for Substantial Completion is attached to this Specifications Section. Use the model language of the sample letter, modified to suit the Project.
   4. Unless decided otherwise by OWNER and ENGINEER, form of certificate of Substantial Completion will be EJCDC® C-625, "Certificate of Substantial Completion" (2013 edition), prepared by ENGINEER.
   5. All warranties provided by equipment manufacturers, vendors, and other material suppliers shall be dated and begin at date of submission of request for substantial completion by CONTRACTOR. Utilization of equipment by CONTRACTOR or the City of Alamo prior to substantial completion shall not warrant beginning of warranty.

1.3 FINAL INSPECTION

A. Final Inspection – General:
   1. Prior to requesting final inspection, verify that all the Work is fully complete and ready for final payment. Partial checklist for this purpose is attached to this Specifications Section.
   2. Sample letter for CONTRACTOR to request final inspection is attached to this Specifications Section. Use the model language of the sample letter, modified to suit the Project.
   3. Procedures for requesting and documenting the final inspection are in the General Conditions, as may be modified by the Supplementary Conditions, and as augmented in this Section.

1.4 REQUEST FOR FINAL PAYMENT AND ACCEPTANCE OF THE WORK

A. Procedure:
   1. Submit request for final payment in accordance with the Agreement and General Conditions, as may be modified by the Supplementary Conditions, and using procedure specified in Section 01 29 76, Progress Payment Procedures, and this Section.
   2. Acceptance of the Work:
      a. Upon ENGINEER's receipt of the final Application for Payment, accompanied by other required Contract closeout documentation in accordance with the Contract Documents, ENGINEER will issue to OWNER and CONTRACTOR a notice of acceptability of the Work, in accordance with the General Conditions, as may be modified by the Supplementary Conditions.
      b. Nothing other than receipt of such notice of acceptability from ENGINEER constitutes acceptance of the Work.
      c. Unless decided otherwise by OWNER and ENGINEER, form of acceptance will be EJCDC® C-626, "Notice of Acceptability of Work", (2014 edition).

B. Request for final payment shall include:
   1. Documents required for progress payments in Section 01 29 76, Progress Payment Procedures.
   2. Documents required in the General Conditions, as may be modified by the Supplementary Conditions.
   3. List of all disputes that Contractor believes are unsettled, presented on CONTRACTOR's letterhead. If there are no such disputes or Claims, so indicate in writing.
   4. Consent of Surety to Final Payment:
      a. Acceptable form includes AIA® G707TM , "Consent of Surety to Final Payment" (1994 or later edition), or other form acceptable to OWNER.
   5. Releases of Liens:
      a. Submit complete and legally effective releases (satisfactory to OWNER) of all Liens filed in connection with the Work, regardless of whether such Lien was filed by CONTRACTOR or any Subcontractor or Supplier.
      b. Each release of Lien shall be signed by an authorized representative of the entity submitting the release of Lien, and shall include CONTRACTOR's, Subcontractor's, or Supplier's (as applicable) corporate seal, when applicable.
   6. Waivers of Lien Rights:
      a. Submit legally-binding waivers of rights to file Liens (acceptable to OWNER), from CONTRACTOR and each Subcontractor and Supplier that provided CONTRACTOR, Subcontractor, or Supplier with labor, material, or equipment totaling $1,000 or more for the Work.
      b. Furnish final list of Subcontractors and Suppliers, using the form included in Section 01 29 76, Progress Payment Procedures, indicating final amount of the associated subcontract or purchase order for each. Include on the list all lower-tier Subcontractors and Suppliers retained by higher-tier Subcontractors and Suppliers.
      c. Each waiver of Lien rights shall be signed by an authorized representative of the entity submitting waiver of Lien rights, and shall include CONTRACTOR's, Subcontractor's, or Supplier's (as applicable) corporate seal, when applicable.
      d. Waiver of Lien rights may be conditional upon receipt of final payment.
      e. Required Affidavits: Submit the following:
         1) Affidavit of payment of debts and claims, submitted by CONTRACTOR. Acceptable form includes AIA® G706TM, "Contractor's Affidavit of Payment of Debts and Claims" (1994 or later edition), or other form acceptable to OWNER, and;
         2) Affidavit of release of Liens, submitted by CONTRACTOR. Acceptable form includes AIA® G706ATM, "Affidavit of Release of Liens" (1994 or later edition).
      f. Waivers of Lien rights and affidavits and supporting documents furnished under this Paragraph 1.4.B.6 shall comply with the requirements of the General Conditions, as may be modified by the Supplementary Conditions.
      g. Each affidavit furnished shall be signed by an authorized representative of the entity furnishing the affidavit, and shall include issuing entity's corporate seal, when applicable.
      h. Where all required waivers of Lien rights and affidavits are not submitted:

1) Submit letter on CONTRACTOR's letterhead indicating the Subcontractor(s) and Suppliers for whom such waivers or releases were not obtained, amount owed to such entity, reason(s) why such amount was not previously paid, and indicate how CONTRACTOR intends to fulfill its obligations and assure OWNER that associated debts and claims are paid.
2) In lieu of the releases or waivers of Liens specified in Paragraphs 1.4.B.5 and 1.4.B.6 of this section, and as approved by OWNER, CONTRACTOR may furnish receipts or releases in full and an affidavit of CONTACTOR that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which OWNER might in any way be responsible, or which might in any way result in liens or other burdens on OWNER's property, have been paid or otherwise satisfied.
3) If any Subcontractor or Supplier fails to furnish such a release or receipt in full, CONTRACTOR may furnish a bond or other collateral satisfactory to OWNER to indemnify OWNER against any Lien, or OWNER at its option may issue joint checks payable to CONTRACTOR and specified Subcontractors and Suppliers.

7. Evidence satisfactory to OWNER that all title issues (not otherwise addressed by releases of Liens, waivers of Lien rights, and related documentation required in Paragraphs 1.4.B.5 and 1.4.B.6 of this section) have been resolved and that title will pass to OWNER free and clear of other title defects, or will so pass upon final payment.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION

3.1 ATTACHMENTS

A. The documents listed below, following this Section's "End of Section" designation, are part of this Specifications Section:
   1. Sample letter for Contractor's use in requesting inspection for Substantial Completion (two pages).
   2. Sample partial checklist to identify readiness for final inspection (four pages).
   3. Sample letter for Contractor's use in requesting final inspection (one page).

B. In the model language of the attached sample letters for the CONTRACTOR to request inspection for Substantial Completion and the final inspection, italicized language in brackets, e.g., "[insert date]" indicates instructions to the drafter of the letter and often indicates specific information to be inserted by CONTRACTOR; do not include bracketed, italicized text in the final version of the letter(s) prepared for the Project. Non-italicized language in brackets is optional language; use the appropriate language to complete the actual letter for the Project and edit where required to suit the specific circumstances.

END OF SECTION

SAMPLE LETTER FOR CONTRACTOR'S USE IN REQUESTING INSPECTION FOR SUBSTANTIAL COMPLETION

SENT VIA E-MAIL AND U.S. CERTIFIED MAIL/RETURN RECEIPT REQUESTED

[*Date*]

[*Name of Engineer's contact person*]
GIC, LLC
[*Street address*]
[*City, state, postal code*]

Subject:
[*Project name, Contract designation*]
Request for Inspection for Substantial Completion

Dear [*addressee*]:

In our opinion, [all of] [*or*] [a portion of] the Work under the above-referenced Contract is substantially complete as of [*insert month, day, year on which Substantial Completionwas achieved*]. [The specific portion of the Work that we believe is substantially complete is [*insert identification of that portion of the Work that is substantially complete*].]

Enclosed is our listing of uncompleted Work items ("punch list"). In accordance with Paragraph 15.03.A of the General Conditions, we hereby request: 1) That the Engineer schedule and perform the inspection for Substantial Completion as soon as possible, and
2) Issuance of the certificate of Substantial Completion.

In accordance with Paragraph 15.03.D of the General Conditions, upon SubstantialCompletion, we propose the following relative to apportionment of responsibilitiesbetween the Owner and the Contractor:

1. Security, Protection, Insurance:
    a. Site Security: [*insert proposal; address whether Owner or Contractor will beresponsible for security of the Site*].
    b. Protection of the Substantially Completed Work: [*insert proposal; addresswhether Owner or Contractor will be responsible for protection*].
    c. Property Insurance: [*insert proposal; typically Owner assumes responsibility for property insurance upon Substantial Completion*]
2. Operation and Maintenance:
    a. Operation: [*insert proposal; address whether Owner or Contractor will beresponsible for operating the substantially completed Work*].
    b. Maintenance: [*insert proposal; address whether Owner or Contractor will beresponsible for maintaining the substantially completed Work*].
3. Utilities: [*for each of the following, indicate whether Owner or Contractor will beresponsible for utilities and services, or whether responsibility will be shared; if shared, indicate proposed cost-sharing*]
    a. Electricity: [*insert proposal*].
    b. Natural Gas/Fuel/Heating: [*insert proposal*].
    c. Water Supply: [*insert proposal*].

d. Wastewater: [*insert proposal*].

e. Communications (Telephone, Internet, Video): [*insert proposal*].

In accordance with Paragraph 15.08.A of the General Conditions, we understand that theContract's correction period for the Work covered by the certificate of Substantial Completion commences on the Substantial Completion date documented in said certificate. [*Drafter: Also see Paragraph 15.08.C of the General Conditions and, wherenecessary, edit this paragraph of the letter accordingly*.]

Should you have questions or comments regarding this notice, please contact [the undersigned] [*or*] [*insert other contact person's name*], at [*insert telephone number ande-mail address*].

Sincerely,

[*Contractor's company name*]

[*Signatory name*]
[*Signatory's title*]

Attachments:
Preliminary list of uncompleted Work items ("punch list"; [##] pages)

Copies:
[*Owner's project manager*]

SAMPLE PARTIAL CHECKLIST TO IDENTIFY READINESS FOR FINAL INSPECTION

Project:_____
Contract:_____
Contractor: _____

Item No./Description	Completed/Date		In Progress	Not Started	Not Applicable	Target Date	Responsible Entity/Person
1. All Shop Drawings, Samples, and Submittals approved by Engineer	☐		☐	☐	☐		
Remarks:							
2. Final services completed by Suppliers, including submittal of "Supplier Installation Certification" in Section 01 75 11, Checkout and Startup Procedures	☐		☐	☐	☐		
Remarks:							
3. Final Work completed by Subcontractors	☐		☐	☐	☐		
Remarks:							
4. Permits closed out and regulatory compliance transitioned from construction to operations	☐		☐	☐	☐		
Remarks:							
5. All outstanding change issues	☐		☐	☐	☐		

Item No./Description	Completed/Date		In Progress	Not Started	Not Applicable	Target Date	Responsible Entity/Person
are addressed and all Change Proposals submitted							
Remarks:							
6. All Claims are resolved	☐		☐	☐	☐		
Remarks:							
7. All defective Work of which Contractor is aware has been corrected in accordance with the Contract Documents	☐		☐	☐	☐		
Remarks:							
8. Issues related to Constituents of Concern and potential Hazardous Environmental Condition have been fully addressed	☐		☐	☐	☐		
Remarks:							
9. All spare parts, tools, and extra stock materials have been furnished in accordance with the Contract Documents, and documentation thereof submitted to Engineer	☐		☐	☐	☐		
Remarks:							
10. All final Operations & Maintenance manuals have been submitted and accepted by	☐		☐	☐	☐		

Item No./Description	Completed/Date		In Progress	Not Started	Not Applicable	Target Date	Responsible Entity/Person
Engineer							
Remarks:							
11. Manufacturer warranties and software license(s) furnished	☐		☐	☐	☐		
Remarks:							
12. Instruction and training of operations and maintenance personnel is complete and records of training submitted	☐		☐	☐	☐		
Remarks:							
13. MBE/WBE/DBE compliance report(s) submitted (when applicable)	☐		☐	☐	☐		
Remarks:							
14. All field engineering submittals, including survey data, furnished	☐		☐	☐	☐		
Remarks:							
15. All Work on “punch list” is complete in accordance with the Contract Documents	☐		☐	☐	☐		
Remarks:							
16. All record documents submitted to and accepted by Engineer	☐		☐	☐	☐		
Remarks:							

Item No./Description	Completed/Date		In Progress	Not Started	Not Applicable	Target Date	Responsible Entity/Person
17. Contractor is fully demobilized from Site	☐		☐	☐	☐		
Remarks:							
18. All Site restoration is complete	☐		☐	☐	☐		
Remarks:							
19. Final cleaning of all work areas is complete	☐		☐	☐	☐		
Remarks:							
20. Lien waivers or affidavits of payment obtained from Subcontractors and Suppliers	☐		☐	☐	☐		
Remarks:							
21. Evidence of Contractor liability insurance furnished for correction period	☐		☐	☐	☐		
Remarks:							
22. All other required Contract closeout documents obtained	☐		☐	☐	☐		
Remarks:							

SAMPLE LETTER FOR CONTRACTOR'S USE IN REQUESTING FINAL INSPECTION

SENT VIA E-MAIL AND U.S. CERTIFIED MAIL/RETURN RECEIPT REQUESTED

[*Date*]

[*Name of Engineer's contact person*]
GIC, LLC
[*Street address*]
[*City, state, postal code*]

Subject:
[*Project name, Contract designation*]
Request for Final Inspection

Dear [*addressee*]:

In our opinion, all of the Work under the above-referenced Contract is complete and ready for final payment as of [*insert month, day, year on which final completion was achieved*]. In accordance with Paragraph 15.05.A of the General Conditions, we herebyrequest that the Engineer schedule and perform the final inspection as soon as possible. Upon successful completion of the final inspection, we will submit our final Applicationfor Payment accompanied by the required Contract closeout documentation in accordance with the Contract Documents.

Should you have questions or comments regarding this notice, please contact [the undersigned] [*or*] [*insert other contact person's name*], at [*insert telephone number ande-mail address*].

Sincerely,

[*Contractor's company name*]

[*Signatory name*]
[*Signatory's title*]

Attachments:
None

Copies:
[*Owner's project manager*]

SECTION 01 78 23

OPERATIONS AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 SCOPE SUMMARY

A. Submittal requirements for equipment and facility operating and maintenance manuals.

1.2 SUBMITTALS

A. Along with the schedule for other submittals as required in Section 01 33 00, SUBMITTAL PROCEDURES, submit a list of operation and maintenance manuals and parts manuals to be provided.

B. Submit electronic (PDF) copy via e-mail. If file exceeds e-mail size limit, provide manual on a USB Flash Drive. OWNER reserves the right to request hard copies of Operation and Maintenance Manual.

C. Prepare covers with printed title "OPERATION AND MAINTENANCE DATA", and list:
   1. Project title.
   2. Designate applicable system, equipment, material, or finish.
   3. Identify of separate as applicable.
   4. Identify of general subject matter covered in manual.
   5. Identify of equipment number and Specification section.

D. Internally subdivide the binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.

E. Contents: Prepare a Table of Contents for each volume, with each Product or system description identified.
   1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect/ENGINEER, Contractor, Subcontractors, and major equipment suppliers.
   2. Part 2: Operation and maintenance instructions, arranged by system. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
      a. Significant design criteria.
      b. List of equipment.
      c. Parts list for each component.
      d. Operating instructions.
      e. Maintenance instructions for equipment and systems.
      f. Maintenance instructions for special finishes, including recommended cleaning methods and materials and special precautions identifying detrimental agents.
   3. Part 3: Project documents and certificates, including the following:
      a. Shop drawings and product data.
      b. Air and water balance reports.
      c. Certificates.
      d. Photocopies of warranties.

F. Electronic Media Format:
   1. Portable Document Format (PDF):
      a. After all preliminary data has been found to be acceptable to ENGINEER, submit Operation and Maintenance data in PDF format via e-mail.
      b. Files to be exact duplicates of ENGINEER-accepted preliminary data. Arrange by specification number and name.
      c. Files to be fully functional and viewable in most recent version of Adobe Acrobat.

G. Submit one copy of completed volumes in final form 10 days prior to final inspection. This copy will be returned after final inspection, with ENGINEER comments. Revise content of documents as required prior to final submittal.

H. Revise and resubmit final volumes within 10 days after final inspection.

1.3 EQUIPMENT OPERATION AND MAINTENANCE DATA

A. Furnish an electronic file for review of the Draft/Unapproved versions of the operation and maintenance manuals for each piece of equipment or system via e-mail. Once approved, submit final operation and maintenance manuals via e-mail. Operation and maintenance manual must contain all information required for OWNER to operate, maintain, and repair equipment. The manual must be prepared by equipment manufacturer, furnished to the ENGINEER by Contractor, and, as a minimum, contain the following:
   1. Equipment functions, normal operating characteristics, and limiting conditions.
   2. Assembly, installation, alignment, adjustment, and checking instructions.
   3. Operating instructions for start-up, normal operation, regulation and control, normal shutdown, and emergency shutdown.
   4. Lubrication and detailed maintenance instructions. The maintenance instructions are to include detailed drawings giving the location of each maintainable part and lubrication point and detailed instructions on disassembly and reassembly of the equipment.
   5. Troubleshooting guide.
   6. Complete spare parts list with predicted life of parts subject to wear, lists of spare parts recommended on hand for both initial start-up and for normal operating inventory, and local or nearest source of spare parts availability.
   7. Outline, cross-section, and assembly drawings; engineering data; wiring diagram.
   8. Test data and performance curves.
   9. Guarantee, Bond, and Service Agreement: In Accordance with Section 01 77 19, CLOSEOUT REQUIREMENTS.

B. Furnish parts manuals for all equipment. The manual must be prepared by equipment manufacturers, furnished to ENGINEER by CONTRACTOR, and, as a minimum, contain the following.
   1. Detailed drawings giving the location of each maintainable part.
   2. Complete spare parts list with predicted life of parts subject to wear, lists of spare parts recommended on hand for both initial start-up and for normal operating inventory, and local or nearest source of spare parts availability.

1.4 SUPPLEMENTS

A. The supplement listed below, following “End of Section,” are part of this Specification.
   1. Maintenance Summary Form.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

MAINTENANCE SUMMARY

PROJECT:_____

1. EQUIPMENT ITEM_____
2. MANUFACTURER_____
3. EQUIPMENT/TAG NUMBER(S)_____
4. WEIGHT OF INDIVIDUAL COMPONENTS (OVER 100 POUNDS)_____
5. NAMEPLATE DATA (hp, voltage, speed, etc.)_____
6. MANUFACTURER'S LOCAL REPRESENTATIVE_____
   a. Name_____ Telephone No._____
   b. Address_____
7. MAINTENANCE REQUIREMENTS

Maintenance Operation Comments[1]	**Frequency[2]**	**Lubricant[3] (If Applicable)**

[1]List each required maintenance operation and refer to information in manufacturer's standard maintenance manual, if applicable. (Reference to manufacturer's catalog or sales literature is not acceptable.)

[2]Required frequency of each maintenance operation.

[3]Symbol of Lubricant (Refer to Item 8 on the following page).

8. LUBRICANT LIST

Reference Symbol	Shell	Exxon Mobile	Chevron Texaco	BP Amoco	Or Approved Equal

[4]List symbols used in No. 7 above.

9. RECOMMENDED SPARE PARTS FOR OWNER'S INVENTORY.

Part No.[5]	Description	Unit	Quantity	Unit Cost

[5]Identify parts provided by this Contract with two asterisks.

SECTION 01 78 36
WARRANTIES

PART 1 - GENERAL

1.1 SCOPE SUMMARY

A. This section specifies general administrative and procedural requirements for warranties required by the Contract Documents, including manufacturer's standard warranties on products and special warranties.

1.2 SUBMITTAL REQUIREMENTS

A. Submit written warranties to the OWNER. Warranty shall commence at Final Acceptance as stipulated in Paragraph 1.4.

B. Assemble warranties, service, and maintenance contracts, executed by each of the respective manufacturer, suppliers, and subcontractors.

C. Number of original signed copies required: Two (2) each.

D. Table of Contents: Neatly typed, in orderly sequence. Provide complete information for each item.
   1. Product or work item.
   2. Firm, with name of principal, address, and telephone number.
   3. Scope.
   4. Date of beginning of warranty, service, or maintenance contract.
   5. Duration of warranty, or service maintenance contract.
   6. Provide information for OWNER's personnel:
      a. Proper procedure in case of failure.
      b. Instances which might affect the validity of warranty.
   7. Contractor, name of responsible principal, address, and telephone number.

1.3 FORMS OF SUBMITTALS

A. Prepare in duplicate packets. Submit via e-mail. If requested, hardcopies shall be submitted.

B. Format:
   1. Size 8-1/2 x 11 inches, punch sheets for standard 3-post binder.
      a. Fold larger sheets to fit into binders.
   2. Cover: Identify each packet with typed or printed title "WARRANTIES". List:
      a. Title of Project.
      b. Name of Contractor.
   3. Binders: Commercial quality, three-post binder, with durable and cleanable plastic covers and maximum post width of 2 inches.

1.4 WARRANTY SUBMITTAL REQUIREMENTS

A. For all major pieces of equipment, submit a warranty from the equipment manufacturer. The manufacturer's warranty period shall be concurrent with the CONTRACTOR'S for two (2) years, unless otherwise specified in the individual specification section, **commencing at the time of final acceptance by the OWNER**.

B. The CONTRACTOR shall be responsible for obtaining certificates for equipment warranty for all "major equipment" specified. The CONTRACTOR shall still warrant equipment not considered to be "major" in the CONTRACTOR's once-year warranty period even though certificates of warranty may not be required.

C. For certain pieces of equipment, the OWNER may require a warranty greater than two (2) years. The requirement for a two-year warranty shall be specified in individual sections of the Specifications.

1.5 WARRANTY REQUIREMENTS

A. Related Damages and Losses:
   1. When correcting warranted work that has failed, remove, and replace other work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted work.

B. Reinstatement of Warranty:
   1. When work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.

C. Replacement Cost:
   1. Upon determination that work covered by a warranty has failed, replace, or rebuild the work to an acceptable condition complying with requirements of Contract Documents. The CONTRACTOR is responsible for the cost of replacing or rebuilding defective work regardless of whether the OWNER has benefited from use of the work through a portion of its anticipated useful service life.

D. OWNER's Recourse:
   1. Written warranties made to the OWNER are in addition to implied warranties, and shall not limit the duties, obligations, rights, and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the OWNER can enforce such other duties, obligations, rights, or remedies.

E. Rejection of Warranties:
   1. The OWNER reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.

F. OWNER's right to Refuse Work:
   1. The OWNER reserves the right to refuse to accept work for the project where a special warranty, certification, or similar commitment is required on such work or part of the work, until evidence is presented those entities required to countersign such commitments are willing to do so.

G. Disclaimers and Limitations:
   1. Manufacturer's disclaimers and limitation on product warranties do not relieve the CONTRACTOR of the warranty on the work that incorporates the products, nor does it relieve suppliers, manufacturers and subcontractors required to countersign special warranties with the CONTRACTOR.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

SECTION 01 78 39
PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SCOPE SUMMARY

A. Maintenance and submittal of Record Documents and Samples. This section includes administrative and procedural requirements for Project Record Documents, including the following:
   1. Record Drawings
   2. Record Specifications
   3. Record Product Data

B. Making Entries on Drawings:
   1. Using an erasable colored pencil (not ink or indelible pencil), clearly describe change by graphic line and note as required.
      a. Color Coding:
         1) Green when showing information deleted from Drawings.
         2) Red when showing information added to Drawings.
         3) Blue and circled in blue to show notes.
   2. Date entries.
   3. Call attention to entry by “cloud” drawn around area or areas affected.

1.2 MAINTENANCE OF DOCUMENTS AND SAMPLES

A. Maintain on record copy of documents at the site.

B. Store Record Documents and samples in field office if a field office is required by Contract Documents, or in a secure location. Provide files, racks, and secure storage for Record Documents and samples.

C. Label each document “PROJECT RECORD” in neat, large, printed letters.

D. Maintain Record Documents in a clean, dry, and legible condition. Do not use Record Documents for construction purpose.

E. Keep Record Documents and Samples available for inspection by the OWNER/ENGINEER.

1.3 RECORDING

A. Record information concurrently with construction progress. Do not conceal any work until required information is recorded.

B. Contract Drawings and Shop Drawings: Legibly mark each item to record all actual construction, or “as built” conditions.

C. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.

1.4 SUBMITTALS

A. At contract closeout, deliver Project Record Documents to OWNER and comply with the following:
   1. Number of copies: Submit two set(s) of marked-up record prints.
   2. Number of copies: Submit copies of Record Drawings as follows:
      a. Submittal: Submit one set(s) of red lined markups on the Conformed Set of Drawings as Record Drawings. ENGINEER will initiate and date each sheet and mark whether general scope of changes, additional information recorded, and quality of drafting are acceptable.

PART 2 - PRODUCTS

2.1 RECORD DRAWING

A. Record Prints: Maintain one set of blue- or black-line white prints of the Contract Drawings and Shop Drawings.
   1. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.
      a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
      b. Accurately record information in an understandable drawing technique.
      c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
   2. Content: Types of items requiring marking include, but are not limited to, the following:
      a. Dimensional changes to Drawings.
      b. Revisions to details shown on Drawings.
      c. Locations and Depths of underground utilities.
      d. Revisions to routing of piping.
      e. Changes made by Change Order or Change Directive.
      f. Changes made following ENGINEER's written orders.
      g. Details not on the original Contract Drawings.
      h. Field records for variable and concealed conditions.
      i. Record information on the Work that is shown only schematically.
   3. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Record Drawings.
   4. Mark important additional information that was either shown schematically or omitted from original Drawings.
   5. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
   1. Record Prints: Organize Record Prints and newly prepared Record Drawings into manageable set. Bind each set with durable paper cover sheets. Include identification on cover sheets.
   2. Identification: As follows:
      a. Project Name.
      b. Date.
      c. Designation "PROJECT RECORD DRAWINGS."
      d. Name of ENGINEER.
      e. Name of CONTRACTOR.

2.2 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
   1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorder later.
   2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
   3. Record the name of manufacturer, supplier, installer, and other information necessary to provide a record of selections made.
   4. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.
   5. Note related Change orders and Record Drawings where applicable.

2.3 RECORD PRODUCT DATA

A. Preparation: Mark Product Data to indicate the actual product installation where installation varies from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installation that cannot be readily identified and recorder later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders, Record Specifications, and Record drawings where applicable.

2.4 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for Project record Document purposes. Post changes and modifications to Project Record Documents as they occur and submit progress redlines along with pay estimate monthly through CPMS, do not wait until the end of Project.

B. Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for ENGINEER's and OWNER's Representative's reference during normal working hours.

END OF SECTION

SECTION 02 41 00
DEMOLITION

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. This Section covers the labor and materials necessary for the work associated with the demolition required for removal the existing structures.

B. Disconnecting, capping and removal of identified structures, utilities, and plant process piping.

1.2 PROJECT RECORD DOCUMENTS

A. Submit under provisions of General Conditions.

B. Accurately record the actual locations of capped utilities and subsurface obstructions.

1.3 REGULATORY REQUIREMENTS

A. Conform to applicable codes, regulations and/or permits for demolition of structures, safety of adjacent structures, dust control, runoff control and sludge disposal.

B. Notify affected utility companies before starting work and comply with their requirements.

C. Comply with waste manifest procedures. Provide copies of manifest to all parties prior to waste removal.

D. Do not close or obstruct in-plant or other roadways without permission.

E. Conform to applicable regulatory procedures when discovering hazardous or contaminated materials.

F. CONTRACTOR (or CONTRACTOR'S Demolition Subcontractor) shall have documented experience with at least ten (10) similar projects.

G. No blasting will be allowed.

1.4 SUBMITTALS AND SCHEDULING

A. Schedule work and submit a work plan including methods of demolition to be used on each structure under the provisions of Section 01 33 00, SUBMITTAL PROCEDURES.

B. Provide a detailed plan of action and timeline for activities, in advance, for OWNER review. No demolition can begin until the CONTRACTOR's submitted demolition plan has been reviewed and approved by the City of Alamo.

C. Describe demolition removal and disposal procedures for the tank in a demolition plan and provide schedule. The written demolition plan shall include a section regarding how dust and debris will be controlled. Approval of this plan shall not relieve the CONTRACTOR from responsibility of settling claims but is intended as an avenue to expedite and minimize such claims.

1.5 PROJECT CONDITIONS

A. Each respondent shall visit the site and carefully and thoroughly inspect the entire site and structures and verify structures and objects to be demolished and consider in the preparation of his price, all conditions affecting the work required per the drawings and specifications.

B. Each respondent shall satisfy himself as to the limits of removal, replacement, and modification of the existing facilities required to complete the Work as indicated on the drawings and as specified herein.

C. Locate existing exposed and buried utilities and determine the requirements for their protection, or their disposition with respect to the demolition work.

D. Existing painted surfaces contain lead-based paints. Take precautions as required to prevent spread of lead containing particles and dust.

Notice: Some of the existing coatings contain lead; CONTRACTOR shall provide containment to collect all loose, peeling paint, and shall be responsible to provide testing for classification and disposable that satisfies all applicable Federal, State and Local laws.

1.6 QUALITY ASSURANCE

A. Contractor's Personnel: The CONTRACTOR shall have a full complement of personnel, for the proper coordination and expedition of the Work, on a continuous basis until the Work is completed.

B. Notification: The CONTRACTOR shall notify the OWNER and the ENGINEER at least seven (7) days prior to starting WORK at the site. The CONTRACTOR shall reconfirm the commencement of work with the OWNER and ENGINEER twenty-four (24) hours in advance to starting WORK at the site.

C. CONTRACTOR will advise OWNER of final disposition of hazardous wastes prior to hazardous waste disposal and provide documentation at that time which shows transporters and disposal facilities are permitted for their respective activities. All completed hazardous waste manifests will be provided to the City of Alamo with no additional cost to the OWNER.

D. Emergency Information: The CONTRACTOR shall post information concerning product MSDS, emergency medical, fire, rescue, and hazardous waste phone numbers from which personnel on site can obtain information if needed. The CONTRACTOR shall also list a name of a representative the CONTRACTOR who can be reached in case of emergency. The information shall be posted in a central location, so it is visible 24 hours per day. The emergency information shall be posted the entire duration that the CONTRACTOR is performing work at the project site.

E. Contractor Supervision/Competent Person: The CONTRACTOR shall provide a competent person/superintendent, satisfactory to the OWNER, for the work at all times during work hours with the full authority to act for him. The on-site superintendent/competent person shall not be replaced without prior written notification and written approval of the ENGINEER. Should, in the opinion of the OWNER, any language barrier exists between the on-site superintendent and the OWNER or Field Inspector, the CONTRACTOR shall employ a qualified new on-site superintendent at no additional cost to the OWNER.

1.7 JOB CONDITIONS

A. Existing Conditions:
   1. Do not allow material and debris to accumulate on the site.
   2. Do not allow spent cleaning debris, dust, paint chips or emissions of any kind to escape to the atmosphere or adjacent buildings, private property, work sites and parking lots.

B. Damage:
   1. CONTRACTOR shall be responsible for any damage to streets, parking lots, sidewalks, curbs, or other property not specifically called for as an item to be demolished.

1.8 REQUIRED PRECAUTIONS

A. Protection of Grounds:
   1. CONTRACTOR shall provide protection of person and property, including all, drives, roads, walks, buildings, utilities, etc. any damage to such shall be corrected to the OWNER's satisfaction at the CONTRACTORs expense. It is not the OWNER's specific intent to require paint removal prior to cutting the tank during the demolition; however, the CONTRACTOR must determine the means and methods as required by the Specifications to comply with environmental laws regarding potential lead paint disposal and exposure, including OSHA 29 CFR 1926.62 and 3.54 dealing with cutting steel with protective coatings. The CONTRACTOR must also consider the provisions set forth in SSPC Guide No. 6 and 7 when dealing with items containing heavy metals.

B. Containment of Lead Based Paint:

1. CONTRACTOR shall provide containment of all loose, peeling paint. CONTRACTOR may elect to brush free all loose paint prior to disassembly, provide containment of entire structure, lower large sections to the contained ground-level worksite, etc.; however, containment plan shall be submitted to the ENGINEER for approval prior to the start of any work. If at any time the containment system shall fail, the CONTRACTOR shall suspend the Work and shall take all actions necessary to correct the cause of failure prior to resuming the Work. While unlikely given the location of the Work, should paint debris fall on adjacent property or public right-of-way, CONTRACTOR shall be responsible to collect debris.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.1 PREPARATION

A. All work shall be done in conformance with the rules and regulations pertaining to safety established by, but not limited to, OSHA, City of Alamo, and as specified elsewhere in these Specifications.

B. Provide, erect, and maintain temporary barriers and security devices. Materials needed for temporary protection in the form of barricades, fences, enclosures etc, may be “used” construction materials of sound condition and reasonably clean.

C. Protect existing structures and piping that is not to be demolished.

D. Prevent movement or settlement of adjacent structures. Provide bracing and shoring.

E. Arrange for and verify locations of utility services, prior to beginning operations. Mark location of utilities.

F. Cover the ground with at a minimum 6 mil poly sheeting and plywood throughout the demolition and staging area.

3.2 DEMOLITION REQUIREMENTS

A. Conduct demolition to minimize interference with adjacent structures.

B. Cease operations immediately if adjacent structures appear to be in danger and notify ENGINEER, do not resume operation until directed by appropriate authority.

C. Conduct operations with minimum interference to OWNER’s access. Always maintain egress and access.

D. The CONTRACTOR shall be responsible for the disposal of all debris; disposal shall satisfy all applicable, Federal, State, and local laws that govern such disposal.

E. Sprinkle work with atomized water to minimize dust. Provide hoses and water connections for this purpose. No runoff of water allowed.

3.3 MECHANICAL EQUIPMENT

A. Remove mechanical equipment by unbolting or torch cutting of anchor bolts.

B. Anchor bolts to be torch-cut and ground neatly flush with existing concrete.

3.4 PIPE AND ELECTRICAL LINES

A. Existing pipe shown to be abandoned and removed shall be disconnected from piping to remain active by capping the active line with a suitably restrained pipe fitting and thrust blocking provided by poured concrete.

B. All piping shown to be abandoned shall be removed, unless noted otherwise on drawings or approved by OWNER.

C. Pipe to be removed and demolished shall be completely removed and the trench backfilled with suitable material compacted in 6-inch lifts to 98% of maximum standard proctor density.

D. Buried electrical lines located beneath structures or shown to be abandoned shall be disconnected and capped at a depth 36 inches below grade prior to any excavation work in the vicinity.

3.5 CONCRETE AND PIPE REMOVAL

A. The CONTRACTOR shall be responsible for disposal of all concrete, steel members and pipe removed from the jobsite. Any hazardous material located in the foundation, or in the water mains of these structures shall be disposed of in a manner that satisfies all State, Local and Federal laws pertaining to these types of materials.

3.6 EXISTING COATINGS

A. CONTRACTOR shall drum all collected paint debris as necessary, seal, and label accordingly. Debris shall be drummed minimum daily and shall be stored on site until waste is classified.

B. All collected paint debris shall be analyzed by a qualified laboratory for the Toxic Characteristic Leachate Profile (TCLP) test to determine the waste classification. CONTRACTOR shall provide copies of results to the ENGINEER. All waste generated from work on this project, regardless of classification, shall be disposed by the CONTRACTOR in accordance with all applicable Federal, State, and Local laws that govern such disposal.

3.7 RESTORATION OF DAMAGE

A. Any damage to existing site or adjacent grassed areas resulting from CONTRACTOR’s work shall be restored. Any damage which effects drainage of existing property shall be corrected. Disturbed areas include, but are not limited to the tank site property, right-of-way of any state, county, city thoroughfare, and adjoining property. Any damage to adjoining property shall be shaped and sod shall be installed to OWNER’s satisfaction.

B. CONTRACTOR shall work to resolve all damage claims in a timely manner.

END OF SECTION

SECTION 05 05 33
ANCHOR SYSTEMS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:
   1. CONTRACTOR shall provide all professional services, labor, materials, equipment, and incidentals as shown, specified, and required to furnish and install anchor systems.
   2. This Section includes all anchor systems required for the Work but not specified under other Sections.

B. Coordination:
   1. Review installation procedures under this and other Sections and coordinate installation of items to be installed with or before anchor systems Work.

1.2 RELATED SECTIONS

A. Section 01 33 00 – SUBMITTAL PROCEDURES

1.3 REFERENCES

A. Standards referenced in this Section are:
   1. ACI 318, Building Code Requirements for Structural Concrete.
   2. ACI 355.2, Qualification of Post-Installed Mechanical Anchors in Concrete.
   3. ANSI B212.15, Cutting Tools - Carbide-tipped Masonry Drills And Blanks For Carbide-tipped Masonry Drills.
   4. ASTM A194/A194M, Specification for Carbon and Alloy Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both.
   5. ASTM A276, Specification for Stainless Steel Bars and Shapes.
   6. ASTM A493, Specification for Stainless Steel Wire and Wire Rods for Cold Heading and Cold Forging.
   7. ASTM A563, Specification for Carbon and Alloy Steel Nuts.
   8. ASTM B633, Specification for Electrodeposited Coatings of Zinc on Iron and Steel.
   9. ASTM C881/C881M, Specification for Epoxy-Resin-Base Bonding Systems for Concrete.
   10. ASTM E329, Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.
   11. ASTM E488, Test Methods for Strength of Anchors in Concrete and Masonry Elements.
   12. ASTM F593, Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
   13. ASTM F1554, Specification for Anchor Bolts, Steel, 36, 55 and 105-ksi Yield Strength.
   14. FS A-A-1923A, Concrete Expansion Anchors.
   15. ICC-ES AC193, Acceptance Criteria for Mechanical Anchors in Concrete Elements.
   16. ICC-ES AC308, Acceptance Criteria for Post-Installed Adhesive Anchors in Concrete Elements.

1.4 QUALITY ASSURANCE

A. Qualifications:
   1. Testing Laboratory: Shall comply with ASTM E329 and shall be experienced in tension testing of post-installed anchoring systems.
   2. Post-installed Anchor Installer: Shall be experienced and trained by post-installed anchor system manufacturer in proper installation of manufacturer's products. Product installation training by distributors or manufacturer's representatives is unacceptable unless the person furnishing the training is qualified as a trainer by the anchor manufacturer.

1.5 SUBMITTALS

A. Action Submittals: Submit the following:
   1. Shop Drawings:
      a. Listing of all anchor systems products intended for use in the Work including product type, intended location in the Project, and embedded lengths.
   2. Product Data:

a. Manufacturer's specifications, load tables, dimension diagrams, acceptable base material conditions, acceptable drilling methods, and acceptable bored hole conditions.
b. Copies of valid ICC ES reports that presents load-carrying capacities and installation requirements for anchor systems.

B. Delegated Design Submittals:
1. Design Data: Submit the following:
a. Design Calculations for delegated anchor systems. Structural calculations shall include all specified performance criteria. The magnitude of delegated system/anchorage reactions to supporting structure shall be clearly noted. Design calculations shall be signed, sealed and dated by CONTRACTOR's professional engineer.

C. Informational Submittals: Submit the following:
1. Certificates:
a. For each type of anchor bolt or threaded rod, submit copies of laboratory test reports and other data required to demonstrate compliance with the Contract Documents.
b. Post-installed anchor system manufacturer's certification that installer received training in the proper installation of manufacturer's products required for the Work.
2. Manufacturer's Instructions:
a. Installation instructions for each anchor system product proposed for use, including bore hole cleaning procedures and adhesive injection, cure and gel time tables, and temperature ranges (storage, installation and in-service).

1.6 DELIVERY, STORAGE AND HANDLING

A. Storage and Protection:
1. Keep materials dry during delivery and storage.
2. Store adhesive materials within manufacturer's recommended storage temperature range.
3. Protect anchor systems from damage at the Site. Protect products from corrosion and deterioration.

PART 2 - PRODUCTS

2.1 SYSTEM PERFORMANCE

A. General:
1. At locations where conditions dictate that Work specified in other Sections is to be of corrosion resistant materials, provide associated anchor systems of stainless-steel materials, unless other corrosion-resistant anchor system material is specified. Provide anchor systems of stainless-steel materials where stainless steel materials are required in the Contract Documents.
2. Stainless Steel Nuts:
a. For anchor bolts and adhesive anchors, provide ASTM A194/A194M, Grade 8S (Nitronic 60) stainless steel nuts for stainless steel anchors used for anchoring equipment, gates, and weirs, and other locations, if any, where the attachment will require future removal for operation or maintenance. Provide lock washer or double nuts on each anchorage device provided for equipment, as required by equipment manufacturer.
b. For other locations, provide for each anchorage device a nut as specified or as required by anchor manufacturer. When ASTM A194/A194M, Grade 8S (Nitronic 60) nuts are not required for anchor bolts and adhesive anchors as specified in this Section, provide anti-seizing compound where stainless steel rods are used with stainless steel nuts of the same type.
3. Materials that can contact potable water or water that will be treated to become potable shall be listed in NSF/ANSI 61.

B. Design Criteria
1. Size, Length, and Load-carrying Capacity: Comply with the Contract Documents. When size, length or load-carrying capacity of anchor system is not otherwise shown or indicated, provide the following:

a. Anchor Bolts: Provide size, length, and capacity required to carry design load based on values and requirements of Paragraph 3.2.A of this Section. For conditions outside limits of critical edge distance and spacing in Paragraph 3.2.A of this Section, minimum anchor bolt embedment as shown or indicated in Paragraph 3.2.A of this Section apply and capacity shall be based on requirements of Laws and Regulations, including applicable building codes.
b. Adhesive Anchors or Expansion Anchors: Provide size, length, type, and capacity required to carry design load. Anchor capacity shall be based on the procedures required by the building code in effect at the Site. Where Evaluation Service Reports issued by the ICC Evaluation Service are required in this Section, anchor capacities shall be based on design procedure required in the applicable ICC Evaluation Service Report.
    1) General: Determine capacity considering reductions due to installation and inspection procedures, embedment length, strength of base fastening materials, spacing, and edge distance, as indicated in the manufacturer's design guidelines. For capacity determination, concrete shall be assumed to be in the cracked condition, unless calculations demonstrate that the anchor system will be installed in an area that is not expected to crack under any and all conditions of design loading.
    2) Adhesive Anchors: Unless otherwise shown or indicated in the Contract Documents or approved by ENGINEER, provide minimum embedment depth of the greater of the following: required to develop tensile strength of anchor, or a minimum embedment of 10 anchor diameters; and minimum anchor spacing and edge distance of 12 anchor diameters.
    3) Concrete Expansion Anchors: Unless otherwise shown or indicated in the Contract Documents or approved by ENGINEER, provide minimum embedment depth of six anchor diameters, and minimum anchor spacing and edge distance of seven anchor diameters.

2. Delegated Design: When anchor systems are used for supporting materials, equipment, or systems delegated to CONTRACTOR, Subcontractor, or Supplier, provide anchor system suitable for loads indicated in delegated design documents and consistent with the design intent expressed in the Contract Documents. Anchor system shall be designed by a professional engineer, retained by CONTRACTOR, Subcontractor, or Supplier, registered in the same state as the Site, with proper consideration of concrete strength, spacing and edge distance.
    a. Design Loads. Comply with the Contract Documents. When design load of supported material, equipment, or system is not otherwise shown or indicated, provide the following:
        1) Pre-Engineered Building Anchors: Use design loads as determined by Pre-Engineered Metal Building Manufacturer.
        2) Equipment Anchors: Use design load recommended by equipment manufacturer. When equipment can be filled with fluid, use loads that incorporate equipment load and load imposed by fluid.
        3) Pipe Hangers and Supports: Use full weight of pipe, and fluid contained in pipe that are tributary to the support plus the full weight of valves and accessories located between the hanger or support being anchored and the next hanger or support.
        4) Hangers and Supports for Electrical Systems, and HVAC, Plumbing, and Fire Suppression Systems and Piping: Use the full weight of supported system that is tributary to the support plus the full weight of accessories located between the hanger or support being anchored and the next hanger or support. When piping or equipment is to be filled with fluid, anchor systems shall be sized to support such loads in addition to the weight of the equipment, piping, or system, as applicable.

C. Application:
1. Anchor Bolts:
    a. Where anchor bolt is shown or indicated, use cast-in-place anchor bolt unless another anchor type is approved by ENGINEER.
    b. Provide anchor bolts as shown or indicated, or as required to secure structural element to appropriate anchor surface.
2. Concrete Adhesive Anchors:
    a. Use where adhesive anchors are shown or indicated for installation in concrete.
    b. Suitable for use where subject to vibration.
    c. Suitable for use in exterior locations or locations subject to freezing.
    d. Suitable for use in submerged, intermittently submerged, or buried locations.

e. Do not use in overhead applications, unless otherwise shown or approved by ENGINEER.
f. Do not use for pipe hangers, unless otherwise shown or approved by ENGINEER.

3. Concrete Wedge Expansion Anchors:
   a. Use where expansion anchors are shown or indicated for installation in concrete.
   b. Do not use where subject to vibration.
   c. Do not use in exterior locations or locations subject to freezing.
   d. Do not use in submerged, intermittently submerged, or buried locations.
   e. Suitable for use in overhead applications.
4. Drop-in Expansion Anchors:
   a. Use drop-in expansion anchors installed in concrete where light-duty anchors are required to support piping or conduit two-inch diameter or smaller.
   b. Do not use for attaching safety-related systems, such as piping conveying hazardous or potentially hazardous materials, or fire suppression systems.
   c. Do not use where subject to vibration.
   d. Do not use at submerged, intermittently submerged, or buried locations.
   e. Do not use in exterior locations or locations subject to freezing.
   f. Suitable for use in overhead applications.
   g. Do not use for attaching safety-related systems, such as piping conveying hazardous or potentially hazardous materials, or fire suppression systems.
   h. Do not use in overhead applications.

2.2 MATERIALS

A. Anchor Bolts:
   1. Provide straight threaded carbon steel rods complying with ASTM F1554, Grade 55, with heavy hex nuts complying with ASTM A563 Grade A, unless otherwise shown or indicated on the Drawings. Hooked anchor bolts are unacceptable.
   2. Equipment: Provide anchor bolts complying with material requirements of this Section and equipment manufacturer's requirements relative to size, embedment length, and anchor bolt projection. Anchor bolts shall be straight threaded rods with washers and nuts as specified in this Section. Hooked bolts are unacceptable.
   3. Anchoring of Structural Elements: Provide anchor bolts of size, material, and strength shown or indicated in the Contract Documents.

B. Concrete Adhesive Anchors:
   1. General:
      a. Adhesive anchors shall consist of threaded rods anchored into hardened concrete using an adhesive system.
   2. Products and Manufacturers: Provide one of the following:
      a. HIT-RE 500-V3 Injection Epoxy Adhesive Anchoring System, by Hilti Fastening Systems, Inc.
      b. HIT-HY 200-A and HIT-HY 200-R Adhesive Anchoring System, by Hilti Fastening Systems, Inc
      c. SET-XP Adhesive anchoring system, by Simpson Strong-Tie Company, Inc.
      d. Or equal.
   3. Adhesive:
      a. Adhesive system shall use two-component adhesive mix.
      b. Adhesives shall have a current evaluation report by ICC Evaluation Service for use in both cracked and uncracked concrete with seismic recognition for SDC A through F as tested and assessed in accordance with ICC-ES AC308, which incorporates the requirements of ACI 355.4-11
      c. Adhesives shall have minimum bond strength and minimum design bond strength in accordance with Table 05 05 33-A:

TABLE 05 05 33-A
ADHESIVE BOND STRENGTH [1, 2]

Bond Strength (psi)					
Rod Diameter	**Uncracked Concrete**	**Cracked Concrete**	**Dowel Size**	**Uncracked Concrete**	**Cracked Concrete**
1/2-inch	1670	880	#4	1500	1080
5/8-inch	1670	750	#5	1460	1090
3/4-inch	1670	665	#6	1415	1015
7/8inch	1525	610	#7	1370	835
1-inch	1360	595	#8	1330	760
-	-	-	#9	1560	850
1.25-inch	1070	595	#10	1240	475

Table Notes:
1. Bond strengths listed for hammer-drilled, dry hole.
2. Bond strengths listed for maximum short term concrete temperature of 130 degrees F and maximum long term concrete temperature of 110 degrees F.

4. Anchor:
   a. Provide continuously-threaded, AISI Type 316 stainless steel adhesive anchor rod. Threaded rods shall comply with the concrete adhesive anchor manufacturer's specifications as included in the ICC Service Evaluation Report for the anchor submitted. Nuts shall have specified proof load stresses equal to or greater than the minimum tensile strength of the stainless steel threaded rod used. Provide ASTM A194/A194M, Grade 8S (Nitronic 60) stainless steel nuts where required.

C. Concrete Wedge Expansion Anchors:
   1. General:
      a. Concrete wedge expansion anchors shall consist of stud, wedge, nut, and washer.
   2. Products and Manufacturers: Provide one of the following:
      a. Kwik Bolt TZ Wedge Anchor, by Hilti Fastening Systems, Inc.
      b. Strong Bolt 2 Wedge Anchor, by Simpson Strong-Tie Company, Inc.
      c. Or equal.
   3. Anchors shall comply with physical requirements of FS A-A-1923A, Type 4. Provide concrete wedge expansion anchors suitable for use in cracked and uncracked concrete in accordance with ACI 318 Chapter 17. Demonstrate suitability of cracked concrete wedge anchors in accordance with ACI 355.2 prequalification tests.
   4. Interior Dry Non-corrosive Locations: Provide carbon steel anchors complete with nuts and washers, zinc plated, in accordance with ASTM B633.
   5. Other Locations: Provide expansion anchors complete with nuts and washers, AISI Type 304 stainless steel anchor body, in accordance with ASTM A276 or ASTM A493.
   6. Concrete wedge expansion anchors shall have a current ICC Evaluation Service Report for use in both cracked and uncracked concrete with seismic recognition in seismic design Categories A through F when tested and assessed in accordance with ICC-ES AC193.

D. Unless approved by ENGINEER, do not use power-actuated fasteners or other types of bolts and fasteners not specified in this Section.

PART 3 - EXECUTION

3.1 INSPECTION

A. Examine conditions under which materials will be installed and advise ENGINEER in writing of conditions detrimental to proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Anchor Bolts:
   1. Provide anchor bolts as shown or indicated in the Contract Documents, or as required to secure structural element to the appropriate anchor surface.

2. Locate and accurately set anchor bolts using templates or other devices as required, prior to placing concrete. Wet setting of anchor bolts is unacceptable.
3. Protect threads and shank from damage during installation and subsequent construction operations.
4. Unless otherwise shown or approved by ENGINEER anchor bolts shall comply with Table 05 05 33-B:

TABLE 05 05 33-B
SINGLE ANCHOR ALLOWABLE LOADS ON ANCHOR BOLTS [1]

Bolt Diameter (inch)	F1554 Grade 36 F593 Type 316, Condition A				F1554 Grade 55			
	Minimum Embedment (inch)	Minimum Edge Distance and Spacing[2] (inch)	Shear[3,4] (lb)	Tension[3] (lb)	Minimum Embedment (inch)	Minimum Edge Distance and Spacing[2] (inch)	Shear[3] (lb)	Tension[3] (lb)
1/2	6	9	1,262	2,420	8.5	12.75	1,660	3,190
5/8	7.5	11.25	2,010	3,860	10.5	15.75	2,640	5,080
3/4	9	13.5	2,974	5,720	13	19.5	3,910	7,520
7/8	10.5	15.75	4,106	7,890	15	22.5	5,400	10,390
1	12	18	5,386	10,360	17	25.5	7,090	13,450
1 1/8	13.5	20.25	6,787	13,052	19	28.5	8,930	16,580
1 1/4	15	22.5	8,617	16,572	21	31.5	11,340	20,040

Table Notes:
1. Table is based on ACI 318 Chapter 17, f'c = 4000 psi. Table 05 05 33-B is not applicable to anchor bolts embedded in grouted masonry.
2. Critical edge distance and spacing are indicated in the table. Capacity of anchor bolts for other combination of edge distances and spacing shall be evaluated in accordance with ACI 318 Chapter 17.
3. Values for shear and tension listed are not considered to act concurrently. Interaction of tension and shear will be evaluated by ENGINEER in accordance with ACI 318 Chapter 17.

B. Adhesive Anchors and Expansion Anchors – General:
1. Prior to drilling, locate existing reinforcing steel in vicinity of proposed holes. If reinforcing conflicts with proposed hole location, obtain ENGINEER's approval of alternate hole locations to avoid drilling through or damaging existing reinforcing bars.

C. Adhesive Anchors:
1. Installation conditions shall comply with all requirements of the approved product Evaluation Service Report (ESR), including "Conditions of Use." Comply with manufacturer's written installation instructions and the following.
2. Drill holes to adhesive system manufacturer's recommended drill bit diameter to the specified depth. Drill holes in hammering and rotation mode with carbide-tipped drill bits that comply with the tolerances of ANSI B212.15. Core-drilled holes are unacceptable.
3. Before setting adhesive anchor, hole shall be made free of dust and debris by method recommended by adhesive anchor system manufacturer. Hole shall be brushed with adhesive system manufacturer-approved brush and blown clean with clean, dry, oil-free compressed air to remove all dust and loose particles. Hole shall be dry as defined by adhesive system manufacturer.
4. Before injecting adhesive, obtain ENGINEER's concurrence that hole is dry and free of oil and other contaminants.
5. Prior to injecting adhesive into the drilled hole, dispense, to a location appropriate for such waste, an initial amount of adhesive from the mixing nozzle, until adhesive is uniform color.
6. Inject adhesive into hole through injection system-mixing nozzle and necessary extension tubes, placed to bottom of hole. Discharge end shall be withdrawn as adhesive is placed but kept immersed to prevent formation of air pockets. Fill hole to depth that ensures that excess material is expelled from hole during anchor placement.

7. Twist anchors during insertion into partially-filled hole to guarantee full wetting of rod surface with adhesive. Insert rod slowly to avoid developing air pockets.
8. Provide adequate curing in accordance to adhesive system manufacturer's requirements prior to continuing with adjoining Work that could place load on installed adhesive anchors. Do not begin adjoining Work until adhesive anchors are successfully tested or when allowed by ENGINEER.
9. Limitations:
    a. Core drilled holes shall not be allowed.
    b. At time of anchor installation, concrete shall have compressive strength (f'c) of not less than 3.000 psi.
    c. At time of anchor installation, concrete shall have age of not less than 21 days.
    d. Installation Temperature: Comply with manufacturer's instructions for installation temperature requirements. Provide temporary protection and other measures, such as heated enclosures, necessary to ensure that base material temperature complies with anchor systems manufacturer's requirements during installation and curing of adhesive anchor system.
    e. Oversized Holes: Advise ENGINEER immediately if size of drilled hole is larger than recommended by anchor system manufacturer. Cost of corrective measures, including but not limited to redesign of anchors due to decreased anchor capacities, shall be paid by CONTRACTOR.
    f. Embedment depths shall be based on installation in normal-weight concrete with compressive strength of 3,000 psi when embedded in existing concrete, and 4,000 psi when embedded in new concrete.
    g. Obstructions in drill path: When existing reinforcing steel is encountered during drilling, stop and do not damage existing reinforcing. Obtain ENGINEER approval for any required modifications.

D. Expansion Anchors:
1. Comply with expansion anchor manufacturer's written installation instructions and the following:
2. Drill holes using anchor system manufacturer's recommended drill bit diameter and to the specified depth. Drill holes in hammering and rotation mode with carbide-tipped drill bits complying with tolerances of ANSI B212.15. Core drilled holes are unacceptable.
3. Before installing anchor, hole shall be made free of dust and debris by method recommended by anchor system manufacturer. Hole shall be brushed with anchor system manufacturer-approved brush and blown clean with clean, dry, oil-free compressed air to remove all dust and loose particles.
4. Before installing anchor, obtain ENGINEER's concurrence that hole is dry and free of oil and other contaminants.
5. Protect threads from damage during anchor installation. Drive anchors not less than four threads below surface of the attachment. Set anchors to anchor manufacturer's recommended torque using a torque wrench.
6. Limitations:
    a. At time of anchor installation, concrete shall have age of not less than 7 days.
    b. At time of anchor loading, concrete shall have attained full specified compressive strength (f'c).

E. Anti-Seizing Compound:
1. Provide anti-seizing compound in accordance with anti-seizing compound manufacturer's installation instructions, at locations indicated in Paragraph 2.1.B of this Section.
2. Do not use anti-seizing compound at locations where anchor bolt or adhesive anchor will contact potable water or water that will be treated to become potable.

3.3 CLEANING

A. After embedding concrete is placed, remove protection and clean bolts and inserts.

3.4 FIELD QUALITY CONTROL

A. Site Tests:
1. OWNER Will employ testing agency to perform field quality tensile testing of production adhesive anchors at the Site, unless otherwise specified.
    a. Testing shall comply with ASTM E488.

b. Test at least ten percent of all types of adhesive anchors. If one or more adhesive anchors fail the test, CONTRACTOR shall pay cost of testing all anchors of the same type installed in the Work. CONTRACTOR shall be responsible for retesting costs.
c. ENGINEER will direct which adhesive anchors are to be tested and indicate test load to be used
d. Apply test loads with hydraulic ram.
e. Displacement of post-installed anchors shall not exceed D/10, where D is nominal diameter of anchor being tested.

2. Correct defective Work by removing and replacing or correcting, as directed by ENGINEER.
3. CONTRACTOR shall pay for all corrections and subsequent testing required to confirm competence in the installation of post-installed mechanical anchors.
4. Testing agency shall submit test results to CONTRACTOR and ENGINEER within 24 hours of completion of test.

B. Manufacturer's Services:
1. Provide at the Site services of qualified adhesive manufacturer's representative during initial installation of adhesive anchor systems to train CONTRACTOR's personnel in proper installation procedures. Manufacturer's representative shall observe to confirm that installer demonstrates proper installation procedures for adhesive anchors and adhesive material.

END OF SECTION

SECTION 05 50 13
MISCELLANEOUS METAL FABRICATIONS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:
   1. CONTRACTOR shall provide all labor, materials, equipment, and incidentals as shown, specified, and required to furnish miscellaneous metal fabrications including surface preparation and shop priming.
   2. The Work also includes:
      a. Providing openings in miscellaneous metal fabrications to accommodate the Work under this and other Sections and attaching to miscellaneous metal fabrications all items such as sleeves, bands, studs, fasteners, and all items required for which provision is not specifically included under other Sections.

B. Coordination:
   1. Review installation procedures under this and other Sections and coordinate the Work to be installed with or attached to miscellaneous metal fabrications Work.
   2. Hot-dip Galvanizing: Coordinate with steel fabricator detailing for and fabrication of assemblies to be hot-dip galvanized, to minimize distortion during galvanizing process.

1.2 RELATED SECTIONS

A. Section 01 33 00, SUBMITTAL PROCEDURES

B. Section 05 05 33, ANCHOR SYSTEMS

C. Section 09 90 81, PAINTING AND PROTECTIVE COATING

1.3 REFERENCES

A. Standards referenced in this Section are:
   1. ANSI A14.3, Ladders – Fixed –Safety Requirements.
   2. ANSI Z359.1, Safety Requirements for Personal Fall Arrest Systems, Subsystems, and Components.
   3. ASTM A36/A36M, Specification for Carbon Structural Steel.
   4. ASTM A53/A53M, Specification for Pipe Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
   5. ASTM A123/A123M, Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
   6. ASTM A153/A153M, Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
   7. ASTM A240/A240M, Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels and for General Applications.
   8. ASTM A320/A320M, Specification for Alloy-Steel and Stainless-Steel Bolting Materials for Low-Temperature Service.
   9. ASTM A384/A384M-02 Standard Practice for Safeguarding Against Warpage and Distortion During Hot-Dip Galvanizing of Steel Assemblies.
   10. ASTM A500, Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
   11. ASTM A572/A572M, Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
   12. ASTM A786/A786M, Specification for Hot-Rolled Carbon, Low-Alloy, High-Strength Low-Alloy, and Alloy Steel Floor Plates.
   13. ASTM A793, Specification for Rolled Floor Plate, Stainless Steel.
   14. ASTM A992/A992M, Specification for Structural Steel Shapes.
   15. ASTM B209, Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
   16. ASTM B211, Specification for Aluminum and Aluminum-Alloy Bar, Rod and Wire.
   17. ASTM B221, Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
   18. ASTM B308/B308M, Specification for Aluminum-Alloy 6061-T6 Standard Structural Profiles.
   19. ASTM B429, Specification for Aluminum-Alloy Extruded Structural Pipe and Tube.

20. ASTM B632/B632M, Specification for Aluminum-Alloy Rolled Tread Plate.
21. AWS D1.1/D1.1M, Structural Welding Code – Steel.
22. AWS D1.2/D1.2M, Structural Welding Code – Aluminum.
23. AWS D1.6, Structural Welding Code – Stainless Steel.
24. NAAMM, Metal Finishes Manual.

1.4 QUALITY ASSURANCE

A. Qualifications:
   1. Welding:
      a. Qualify welding processes and welding operators in accordance with AWS D1.1/D1.1M, D1.2/D1.2M, or D1.6, as applicable.
      b. When requested by ENGINEER, provide certification that each welder employed on or to be employed for the Work have satisfactorily passed AWS qualification tests within previous 12 months. Ensure that all certifications are current.

B. Regulatory Requirements: Conform to the following:
   1. 29 CFR 1910, Occupational Health and Safety Standards.

1.5 SUBMITTALS

A. Action Submittals: Submit the following:
   1. Shop Drawings:
      a. Fabrication and erection details for assemblies of miscellaneous metal Work. Include plans, elevations, and details of sections and connections. Show anchorage and accessory items.
      b. Include complete information for fabrication of the miscellaneous metal components, including but not limited to location, type, and size of bolts, details of blocks, copes and cuts, connections, camber, holes, member sizes and lengths, and other pertinent data.
      c. Clearly indicate welds using standard AWS notations and symbols, and clearly show or indicate size, length, and type of each weld
      d. Include setting drawings and templates for locating and installing miscellaneous metal items and anchorage devices.
   2. Product Data:
      a. Copies of manufacturer's specifications, load tables, dimension diagrams, anchor details, and installation instructions for products to be used in miscellaneous metal Work, including welding electrodes and rods.

B. Informational Submittals: Submit the following:
   1. Test and Evaluation Reports:
      a. Mill test report that indicates chemical and physical properties of each type of material, when requested by ENGINEER.
   2. Qualifications Statements:
      a. Copies of welder's certifications, when requested by ENGINEER.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Packing, Shipping, Handling and Unloading:
   1. Deliver products to Site to ensure uninterrupted progress of the Work. Deliver anchorage materials to be embedded in other construction in ample time to prevent delaying the Work.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Steel:
   1. W-Shapes and WT-Shapes: ASTM A992/A992M.
   2. S-Shapes and Channels: ASTM A572/A572M, Grade 50.
   3. Hollow Structural Sections: ASTM A500, Grade B.
   4. Angles, Plates, Bars: ASTM A36/A36M.
   5. Steel Pipe: ASTM A53/A53M, Grade B.

B. Aluminum:
   1. Aluminum Shapes: ASTM B308/B308M, Alloy 6061-T6, ASTM B 221, Alloy 6061-T6.

2. Aluminum Tubes and Pipes: ASTM B429, Alloy 6061-T6.
3. Aluminum Bars and Rod: ASTM B211, Alloy 6061-T6.
4. Aluminum Plates: ASTM B209, Alloy 6061-T6.

C. Stainless Steel:
1. Plates and Sheets: ASTM A240/A240M, Type 304L or Type 316L stainless steel.
2. Submerged or Intermittently Submerged: Type 316L stainless steel.
3. Non-submerged: Type 304L stainless steel.

D. Stainless Steel Fasteners and Fittings: ASTM A 320/A 320M, Type 304L or Type 316 Stainless Steel.

E. Zinc-coated Hardware: ASTM A153/A153M.

2.2 MISCELLANEOUS METAL ITEMS

A. Shop Assembly:
1. Pre-assemble items in the shop to the greatest extent possible to minimize field-splicing and field-assembly of units at the Site. Disassemble units only to extent necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

B. Miscellaneous Framing and Supports:
1. Provide miscellaneous metal framing and supports that are not part of structural steel framework and are required to complete the Work.
2. Fabricate miscellaneous units to sizes, shapes, and profiles shown on the Drawings or, if not shown, of required dimensions to receive adjacent grating, plates, tanks, doors, and other work to be retained by the framing.
3. Except as otherwise shown, fabricate from structural shapes, plates, and bars, of all-welded construction using mitered corners, welded brackets, and splice plates and minimum number of joints for field connection.
4. Cut, drill, and tap units to receive hardware and similar items to be anchored to the Work.
5. Furnish units with integrally welded anchors for casting into concrete or building into masonry. Furnish inserts if units are to be installed after concrete is placed.
   a. Except as otherwise shown, space anchors, 2.0 feet on centers, and provide units the equivalent of 1.25-inch by 1/4-inch by eight-inch strips.
   b. Galvanize exterior miscellaneous frames and supports.
   c. Where shown or indicated, galvanize miscellaneous frames and supports that are not to be installed outdoors.
6. Miscellaneous steel framing and supports shall be hot-dip galvanized and finish-painted, unless otherwise shown or indicated.
7. Surface preparation and painting of galvanized surface shall conform to Section 09 90 81, PAINTING AND PROTECTIVE COATING.

C. Fasteners and Hardware: Provide Type 316 stainless steel fasteners for aluminum fabrications and zinc-coated hardware for galvanized fabrications, unless otherwise shown or specified.

D. Anchors and Expansion Anchors: Refer to Section 05 05 33, ANCHOR SYSTEMS.

2.3 FINISHING

A. Surface Preparation and Shop Priming: Perform surface preparation and apply primer coat to miscellaneous metal fabrications in the shop. Conform to surface preparation and shop priming requirements in Section 09 90 81, PAINTING AND PROTECTIVE SYSTEMS

B. Galvanizing:
1. Galvanizing of fabricated steel items shall comply with ASTM A123/A123M.
2. Details of fabrication of steel items and assemblies to be hot-dip galvanized shall conform to recommendations of ASTM A384/A384M to minimize the potential for distortion.

C. Aluminum Finish: Provide natural mill finish for aluminum Work unless otherwise shown or specified.

2.4 SOURCE QUALITY CONTROL

A. Tests and Inspections:

1. Materials and fabrication procedures shall be subject to inspection and tests in the mill, shop, and field, conducted by a qualified inspection agency. Such inspections and tests will not relieve CONTRACTOR of responsibility for providing materials and fabrication procedures complying with the Contract Documents.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions under which the Work is to be performed and notify ENGINEER in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Install miscellaneous metal fabrications accurately in location, alignment, and elevation, plumb, level, true, and free of rack, measured from established lines and levels. Brace temporarily or anchor temporarily in formwork where fabrications are to be built into concrete, masonry, or other construction.

B. Anchor securely as shown and as required for the intended use, using concealed anchors where possible.

C. Fit exposed connections accurately together to form tight, hairline joints. Field-weld steel connections that are not to be exposed joints and cannot be shop-welded because of shipping size limitations. Comply with AWS D1.1/D1.1M, D1.2/D1.2M and D1.6, as applicable to the material being welded. Grind steel joints smooth and touch-up shop paint coat. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication, and are intended for bolted or screwed field connections.

D. Protection of Aluminum from Dissimilar Materials:
   1. Coat surfaces of aluminum that will contact dissimilar materials such as concrete, masonry, and steel, in accordance with Section 09 90 81, PAINTING AND PROTECTIVE COATING.

END OF SECTION

SECTION 07 92 00
JOINT SEALANTS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:
   1. CONTRACTOR shall provide all labor, materials, tools, equipment, and incidentals as shown, specified, and required to furnish and install joint sealants.
   2. Extent of each type of calking and sealant is shown or indicated and includes the following:
      a. Interior and exterior joints in equipment and construction systems not filled by another material, and that are not required to be open for operation.
      b. Joints specified to be recalked.

B. Coordination:
   1. Review installation procedures under other Sections and coordinate installation of items to be installed with or before joint sealants.
   2. Coordinate final selection of joint sealants to that materials are compatible with all calking and sealant substrates specified.

C. Related Sections:
   1. Not Applicable.

1.2 REFERENCES

A. Standards referenced in this Section are:
   1. ASTM C510, Test Method for Staining and Color Change of Single - or Multicomponent Joint Sealants.
   2. ASTM C661, Test Method for Indentation Hardness of Elastomeric - Type Sealants by Means of a Durometer.
   3. ASTM C793, Test Method for Effects of Accelerated Weathering on Elastomeric Joint Sealants.
   4. ASTM C794, Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants.
   5. ASTM C920, Specification for Elastomeric Joint Sealants.
   6. ASTM C1021, Practice for Laboratories Engaged in Testing Building Sealants.
   7. ASTM C1087, Test method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems.
   8. ASTM C1193, Guide for Use of Joint Sealants.
   9. ASTM C1247, Practice for Durability of Sealants Exposed to Continuous Immersion in Liquids.
   10. BAAQMD Regulation 8, Rule 51.
   11. FS TT-S-00227, Sealing Compound: Elastomeric Type, Multi-component (for Calking, Sealing, and Glazing in Buildings and Other Structures).
   12. FS TT-S-00230, Sealing Compound: Elastomeric Type, Single Component (for Calking, Sealing, and Glazing in Buildings and Other Structures).
   13. NSF/ANSI Standard 61, Drinking Water System Components – Health Effects
   14. SCAQMD Rule 1168.

1.3 QUALITY ASSURANCE

A. Qualifications:
   1. Installer: Engage a single installer, approved by product manufacturer, regularly engaged in calking and sealant installation and with successful experience in applying types of products required, and who employs only tradesmen with specific skill and successful experience in the type of Work required.
   2. Testing Laboratory: Furnish services of independent testing laboratory qualified according to ASTM C1021, for conducting testing required.

B. Component Supply and Compatibility:
   1. Obtain materials only from manufacturers who will, if required:
      a. Furnish at the Site services of a qualified technical representative to advise installer of proper procedures and precautions for using materials.
      b. Test joint sealants for compatibility with substrates for conformance with FS-TT-S-00227, and recommend remedial procedures as required.
   2. Before purchasing each sealant. Provide products that are fully compatible with joint surfaces, joint fillers, and other materials in joint system. Provide products that are fully compatible with actual installation condition, verified by manufacturer's published data or certification, and as shown on approved Shop Drawings and other approved submittals.

C. Product Testing: Provide test results of laboratory pre-construction compatibility and adhesion testing, as specified in Article 3.1 of this Section, by qualified testing laboratory, based on testing of current sealant formulations within a 36-month period preceding the Notice to Proceed for the Work.
   1. Test elastomeric joint sealants for compliance with requirements specified by reference to ASTM C920 and, where applicable, to other standard test methods.
   2. Test other joint sealants for compliance using specified post-construction field adhesion test.

D. Mock-ups:
   1. Prior to installing joint sealant Work but after ENGINEER's approval of Samples, provide Sample of type of calking and sealant in areas selected by ENGINEER to show representative installation of calkings and sealants. Obtain ENGINEER's approval of visual qualities of mock-ups before starting calking and sealant Work. Retain and protect mock-ups during construction as a standard for judging completed calking and sealant Work. Do not alter or destroy mock-ups until so allowed by ENGINEER.
   2. Perform the following testing on calking and sealant mock-up, as specified in this Section: Post-construction field adhesion testing and water leak test.
   3. Work that does not comply with test requirements on Sample areas will be considered defective.

1.4 SUBMITTALS

A. Action Submittals: Submit the following:
   1. Shop Drawings:
      a. Schedule of joint sealants installation, indication each specific surface where calking or sealants are to be provided and the material proposed for reach application. .
   2. Product Data:
      a. Copies of manufacturer's data sheets including color charts, specifications, recommendations, and installation instructions for each type of sealant, calking compound, and associated miscellaneous material required. Include manufacturer's published data, indicating that each product complies with the Contract Documents and is intended for the applications shown or indicated.
      b. Product test reports.
   3. Samples:
      a. Each type of actual cured material of each calking and sealant specified, in each of manufacturer's standard colors.
      b. Samples will be reviewed by ENGINEER for color and texture only. Compliance with other requirements is responsibility of CONTRACTOR.

B. Informational Submittals; Submit the following:
   1. Certificates:
      a. Certify that materials are suitable for intended use and materials meet or exceed requirements of the Contract Documents.
      b. Certification from manufacturer that products furnished are appropriate for surfaces and conditions to which they will be applied.
      c. Certify that applicator is approved by manufacturer.
   2. Field Quality Control Submittals:
      a. Results of tests on job mock-ups.
      b. Pre-construction and post-construction field test reports.
      c. Compatibility and adhesion test reports.
      d. Contractor's Field Test Report Logs:
         1) Indicate time present at the Site

2) Include observations and results of field tests, and document compliance with manufacturer's installation instructions and supplemental instructions provided to installers

3. Qualifications: Submit qualifications for:
   a. Installer.

C. Closeout Submittals: Submit the following:
   1. Operation and Maintenance Data.
      a. Recommended inspection intervals.
      b. Instructions for repairing and replacing failed sealant joints.
   2. Warranty: Submit written warranties as specified in this Section.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Comply with the following requirements:
   1. Delivery of Products:
      a. Deliver products in calking and sealant manufacturer's original unopened, undamaged containers, indicating compliance with approved Shop Drawings and approved Sample color selections.
      b. Include the following information on label:
         1) Name of material and Supplier.
         2) Formula or Specification Section number, lot number, color and date of manufacture.
         3) Mixing instructions, shelf life, and curing time, when applicable.
   2. Storage of Products:
      a. Do not store or expose materials to temperature above 90 degrees F or store in direct sunlight.
      b. Do not use materials that are outdated as indicated by shelf life.
      c. Store sealant tape in manner that will not deform tape.
      d. In cool or cold weather, store containers for sixteen hours before using in temperature of approximately 75 degrees F.
      e. When high temperatures prevail, store mixed sealants in a cool place.
   3. Handling:
      a. Do not open containers or mix components until necessary preparatory Work and priming are complete.

1.6 JOB CONDITIONS

A. Environmental Conditions:
   1. Do not install joint sealants under adverse weather conditions, or when temperatures are below or above manufacturer's recommended limitations for installation.
   2. Proceed with the Work when forecasted weather conditions are favorable for proper cure and development of high-early bond strength
   3. Where joint width is affected by ambient temperature variations, install elastomeric sealants when temperatures are in the lower third of manufacturer's recommended installation temperature range, so that sealant will not be subjected to excessive elongation and bond stress at subsequent low temperatures.
   4. When high temperatures prevail, avoid mixing sealants in direct sunlight.
   5. Supplemental heat sources required to maintain both ambient and surface temperatures within the range recommended by manufacturer for material applications are not available at the Site.
   6. Provide supplemental heat and energy sources, power, equipment, and operating, maintenance, and temperature monitoring personnel.
   7. Do not use heat sources that emit carbon dioxide or carbon monoxide into areas of calking, sealants, and painting Work, and areas where OWNER's personnel or construction personnel may work. Properly locate and vent such that sources to outdoors so that joint sealants and other Work are unaffected by exhaust.

1.7 WARRANTY

A. Provide written warranty, signed by manufacturer and CONTRACTOR, agreeing to repair or replace sealants that fail to perform as air-tight and watertight joints; or fail in join adhesion, cohesion, abrasion resistance, weather resistance, extrusion resistance, migration resistance, stain resistance, or general durability; or appear to deteriorate in any other manner not clearly specified in approved Shop Drawings and other submittals, as an inherent quality of material for exposure indicated.
   1. Provide manufacturer warranty for period of one year from date of Substantial Completion of joints sealants Work.
   2. Provide installer warranty for period of two years from date of Substantial Completion of joint sealants Work.

PART 2 - PRODUCTS

2.1 SYSTEM PERFORMANCE

A. Provide elastomeric joint sealants for interior and exterior joint applications that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

B. Provide colors selected by ENGINEER from calking and sealant manufacturer's standard and custom color charts. "Or equal" manufacturers shall provide same generic products and colors as available from manufacturers specified.

2.2 MATERIALS

A. Exterior and Interior Vertical Joints; Non-submerged
   1. Two-component Polyurethane Sealant:
      a. Products and Manufacturers: Provide one of the following:
         1) Sikaflex- 2c NS by Sika Corporation.
         2) Dymeric 240 FC by Tremco Sealant/Waterproofing Division of RPM International, Inc.
         3) Or approved equal.
      b. Polyurethane based, two-component elastomeric sealant complying with:
         1) FS TT-S-00227E: Type II (non-sag) Class A and ASTM C920, Type M, Grade NS, Class 25.
         2) Adhesion-in-Peel, FS TT-S-00227E and ASTM C794: (Minimum five pounds per linear inch with no adhesion failure): 10 pounds.
         3) Hardness (Standard Conditions), ASTM C661: 25 to 35 (Shore A).
         4) Stain and color change, FS TT-S-00227E and ASTM C510: No discoloration or stain.
         5) Accelerating Aging, ASTM C793: No change in sealant characteristics after 250 hours in weatherometer.
         6) Rheological Vertical Displacement at 120 degrees F, FS TT-S-00227E: No sag.
         7) VOC Content: 100g/L, maximum.

B. Exterior and Interior Horizontal Joints; Non-submerged:
   1. Two-component Polyurethane Sealant:
      a. Products and Manufacturers: Provide one of the following:
         1) Sikaflex- 2c SL by Sika Corporation
         2) THC/900 by Tremco Sealant/ Waterproofing Division of RPM International, Inc.
         3) Or approved equal.
      b. Polyurethane based, two-component elastomeric, self-leveling sealant complying with the following:
         1) FS-TT-S-00227E, Type I (self-leveling) Class A, and ASTM C920, Type M, Grade P, Class 25
         2) Water Immersion Bond, FS TT-S-00227E: Elongation of 50 percent with no adhesive failure.
         3) Hardness (Standard Conditions), ASTM C661: 35 to 45.
         4) Stain and Color Change, FS TT-S-00227E and ASTM C510: No discoloration or stain.

5) Accelerating Aging, ASTM C793: No change in sealant characteristics after 250 hours in weatherometer.
6) VOC Content: 165g/L, maximum.

C. Miscellaneous Materials:
1. Joint Cleaner: As recommended by calking and sealant manufacturer.
2. Joint Primer and Sealer: As recommended for compatibility with calking and sealant by calking and sealant manufacturer.
3. Bond Breaker Type: Polyethylene tape or other plastic tape as recommended for compatibility with calking and sealant by calking and sealant manufacturer, to be applied to sealant-contact surfaces where bond to substrate or joint filler must be avoided for proper performance of calking and sealant. Provide self-adhesive tape where applicable.
4. Sealant Backer Rod: Compressible rod stock polyethylene foam, polyethylene jacketed polyurethane foam, butyl rubber foam, neoprene foam or other flexible, permanent, durable nonabsorptive material as recommended for compatibility with calking and sealant by calking and sealant manufacturer. Provide size and shape of rod that will control joint depth for sealant placement, break bond of sealant at bottom of joint, form optimum shape of sealant bead on back side, and provide highly-compressible backer to minimize possibility of sealant extrusion when joint is compressed.
5. Low-temperature Catalyst: As recommended by calking and sealant manufacturer.

PART 3 - EXECUTION

3.1 INSPECTION

A. Examine joint surfaces, substrates, backing, and anchorage of units forming sealant rabbet, and conditions under which calking and sealant Work will be performed, and notify ENGINEER in writing of conditions detrimental to proper and timely completion of the Work and performance of sealants. Do not proceed with calking and sealant Work until unsatisfactory conditions are corrected.

B. Laboratory Pre-construction Compatibility and Adhesion Testing: Submit to joint sealant manufacturers for testing indicated below samples of materials that will contact or affect joint sealants.
1. Use ASTM C1087 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
2. Submit at least eight pieces of each type of material, including joint substrates, shims, joint sealant backings, secondary seals, and miscellaneous materials.
3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
4. For products that fail tests, obtain joint-sealant manufacturer’s written instruction for corrective measures including using specially formulated primers.
5. Immersion Testing: ASTM C1247 for potable water and wastewater.
6. Testing will not be required if joint sealant manufacturers submit joint preparation data based on previous testing of current sealant products for adhesion to, and compatibility with, joint substrates and other materials those submitted and mock-up field testing is acceptable.

3.2 PREPARATION

A. Protection: Do not allow joint sealants to overflow or spill onto adjoining surfaces, or to migrate into voids of adjoining surfaces including rough textured materials. Use masking tape or other precautionary devices to prevent staining of adjoining surfaces, by either the primer/sealer or calking and sealant materials.

B. Joint Surface Preparation:
1. Clean joint surfaces immediately before installing sealant compound. Remove dirt, weakly adhering coatings, moisture and other substances that would interfere with bonds of sealant compound as recommended in sealant manufacturer’s written instructions as shown on approved Shop Drawings.
2. If necessary, clean porous materials by grinding, sandblasting, or mechanical abrading. Blow out joints with oil-free compressed air or by vacuuming joints prior to applying primer or sealant.

3. Roughen joint surfaces on vitreous coated and similar non-porous materials, when manufacturer's data indicates lower bond strength than for porous surfaces. Rub with fine abrasive cloth or steel wool to produce a dull sheen.

C. Mixing:
   1. Comply with sealant manufacturer's written instructions for mixing multi-component sealants.
   2. Thoroughly mix components before use.
   3. Add entire contents of activator can to base container. Do not mix partial units.
   4. Mix contents for minimum of five minutes or as recommended by sealant manufacturer, until color and consistency are uniform.

3.3 INSTALLATION

A. Install joint sealants after adjacent areas have been cleaned and before joint has been cleaned and primed, to ensure calking and sealant joints will not be soiled. Replace calking and sealant joints soiled after installation.

B. Comply with sealant manufacturer's written instructions except where more stringent requirements are shown or indicated in the Contract Documents, and except where manufacturer's technical representative directs otherwise, only as acceptable to ENGINEER.

C. Prime or seal joint surfaces as shown on approved Shop Drawings and approved other submittals. Do not allow primer or sealer to spill or migrate onto adjoining surfaces. Allow primer to dry prior to applying sealants.

D. Apply masking tape before installing primer, in continuous strips in alignment with joint edge to product sharp, clean interface with adjoining materials. Remove tape immediately after joints have been sealed and tooled as directed.

E. Confirm that compressible filler is installed before installing sealants.

F. Do not install sealants without backer rods and bond breaker tape.

G. Roll back-up rod stock into joint to avoid lengthwise stretching. Do not twist, braid, puncture, or prime backer rods.

H. Employ only proven installation techniques that will ensure that sealants are deposited in uniform, continuous ribbons without gaps or air pockets, with complete "wetting" of joint bond surfaces equally on opposite sides. Except as otherwise indicated, fill sealant rabbet to a slightly concave surface slightly below adjoining surfaces. Where horizontal joints are between a horizontal surface and a vertical surface, fill joint to form a slight cove, so that joint will not trap moisture and dirt.

I. Install sealants to depths recommended by sealant manufacturer but within the following general limitations, measured at the center (thin) section of bread.
   1. For horizontal joints in sidewalks, pavements, and similar locations sealed with elastomeric sealants and subject to traffic and other abrasion and indentation exposures, fill joints to depth equal to 75 percent of joint width, but not more than 5/8-inch deep or less than 3/8-inch deep.
   2. For vertical joints subjected to normal movement and sealed with elastomeric sealants and not subject to traffic, fill joints to a depth equal to 50 percent of joint width, but not more than 1/2-inch deep or less than 1/4-inch deep.

J. Remove excess and spillage of compounds promptly as the Work progresses.

K. Cure calking and sealant compounds in compliance with manufacturer's instructions and recommendations, to obtain high-early bond strength, internal cohesive strength, and surface durability.

3.4 FIELD QUALITY CONTROL

A. Inspect joints for complete fill, absence of voids, and joint configuration complying with specified requirements.

B. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contracts original sealant.

C. Do not proceed with installation of elastomeric sealants over joint surfaces that have been painted, lacquered, waterproofed, or treated with water repellent or other treatment or coating unless a laboratory test for durability (adhesions), in compliance with FS TT-S-00227, has successful demonstrated that sealant bond is not impaired by the coating or treatment. If laboratory test has not been performed or shows bond interference, remove coating or treatment from joint surfaces before installing sealant.

3.5 ADJUSTING AND CLEANING

A. Where leaks and lack of adhesion are evident, replace sealant.

B. Clean adjacent surfaces of sealant and soiling resulting from the Work. Use solvent or cleaning agent recommended by sealant manufacturer. Leave all finish Work in neat, clean condition.

C. Protect sealants during construction so that they will be without deterioration, soiling, or damage at time of readiness for final payment of the Contract.

3.6 PROTECTION

A. During and after curing period, protect joint sealants from contact with contaminating substances and from damage resulting from construction operations or other causes, so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original Work.

END OF SECTION

SECTION 09 90 81
PAINTING AND PROTECTIVE COATING

PART 1 - GENERAL

1.1 SCOPE

A. The work of this section includes general specifications for coating of all interior surfaces, and the painting of all exterior surfaces of the ClariCone® Solids Contract Clarifier. Clarifier is located within the fence line of the Alamo Water Treatment Plant.

1.2 GENERAL REQUIREMENTS

A. Furnish all materials, equipment, accessories and supplies required for work specified herein.
   1. Obtain all permits necessary to complete the surface preparation and coatings work for this project including: removal, handling, storage, and disposal of hazardous/toxic waste materials. For painting and blasting of water storage tanks or clarifiers the contractor shall perform the work covered herein in accordance with TCEQ regulations “Abrasive Blasting of Water Storage Tanks performed by Portable Operations” Title 30, Part 1, Chapter III; Subchapter A; Division 3.

B. Use non-lead coatings which comply with all applicable laws, regulations, ordinances of the federal, state and local governments. VOC regulations per the EPA shall also be followed.

C. Specifications cover the surface specifications for preparation and painting of the clarifier surfaces, both interior and exterior, unless otherwise specified or excluded.

D. The environment shall be protected to include adjacent work, traffic, property and people from damage from overspray, over-blast, and spillage. Should damages occur the Contractor is responsible to make provisions for repair as quickly as possible.

E. Storage and handling of materials shall be done in accordance with the manufacturer’s Product Design Specification (PDS).

F. Provide access equipment, lighting and necessary equipment to perform work that allows for safe access to the inspector for inspection. All equipment, operations and installation of equipment shall comply with OSHA 29 CFR 1910 & 29 CFR 1926.

G. Safety of all personnel is the contractor’s responsibility. The contractor shall provide personnel who are painting with explosion-proof lighting and proper electrically grounded equipment. All handling and application of coatings shall be in accordance with the manufacturer’s PDS and Material Safety Data Sheets (MSDS).

H. Site cleanup shall be done by the Contractor on a daily basis (ongoing basis).

1.3 REFERENCE SPECIFICATIONS AND STANDARDS

A. Without limiting the general aspects of other requirements of these specifications, all surface preparation, coating and painting of interior and exterior surfaces and inspection shall conform to the current version of applicable requirements of the Society for Protective Coatings, NACE International, ASTM (American Society for Testing and Materials), AWWA and the manufacturer's printed instructions. The Society of Protective Coatings and NACE have merged becoming the Association for Materials Protection and Performance (AMPP). All references to these former organizations’ specifications are understood to include the latest published requirements and standards of the AMPP as intended for this contract.
   1. ASTM (American Society for Testing and Materials)
      a. ASTM D 520 Standard Specification for Zinc Dust Pigment
      b. ASTM D 4417 Standard Test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel
      c. ASTM E 337 Standard Practice Test Method for Measuring Humidity with a Psychrometer
      d. ASTM D2200 Standard Methods of Evaluating Degree of Rusting on Painted Surfaces
   2. ANSI (American National Standards Institute)

a. ANSI/ASC 29.4 Exhaust Systems Abrasive Blasting Operations – Ventilation and Safe Practice
b. ANSI/NSF Standard 61 Drinking Water Components

3. AWWA (American Water Works Association)
   a. AWWA D 102 Coating Steel Water Storage Tanks
4. Consumer Product Safety Act, Part 1303
5. NACE International
   a. NACE Publication TPC2
      1) Coatings and Linings for Immersion Service: Chapter 1 Safety, Chapter Surface Preparation, Chapter 3 Curing, and Chapter 4 Inspection
   b. NACE Standard SP0178
      1) Standard Recommended Practice – Fabrication Details, Surface Finish Requirements and Proper Design Considerations for Tanks and Vessels to be Lined for Immersion Service
   c. NACE Standard SP0188
      1) Standard Recommended Practice – Discontinuity (Holiday) Testing of Protective Coatings
   d. NACE Standard RP0287
      1) Field Measurement of Surface Profile of Abrasive Blast-Cleaned Steel Surfaces Using a Replica Tape
   e. NACE Standard RP0288
      1) Standard Recommended Practice, Inspection of Linings on Steel and Concrete
6. OSHA (Occupational Safety & Health Administration)
   a. 1915.35 Standards – 29 CFR – Painting
7. SSPC (Society for Protective Coatings)
   a. SSPC-SP2: Hand Tool Cleaning
   b. SSPC-SP3: Power Tool Cleaning
   c. SSPC-SP11: Power Tool Cleaning to Bare Metal
   d. SSPC-PA-1: Shop, Field and Maintenance Painting
   e. SSPC-PA-2: Measurement of Dry Film Thickness with Magnetic Gages
   f. SSPC-PA-3: Guide to Safety in Paint Application
   g. SSPC-Guide 12Guide for Illumination of Industrial Painting Project
   h. SSPC-VIS 1-89 Pictorial Surface Preparation Standards for Painting Steel Surfaces
   i. SSPC Paint Spec 36: Two Component Weatherable Aliphatic Polyurethane Topcoat, Performance-Based
8. SSPC/NACE Joint Standards
   a. SSPC-SP5/NACE 1: White Metal Blast Cleaning
   b. SSPC-SP6/NACE 3: Commercial Blast Cleaning
   c. SSPC-SP7/NACE 4: Brush-Off Blast Cleaning
   d. SSPC-SP10/NACE 2: Near-White Metal Blast Cleaning

B. The Engineer's decision shall be final as the interpretation and/or conflict between any of the referenced specifications and standards contained herein.

1.4 CONTRACTOR

A. The Contractor shall have five (5) years practical and documented experience and successful history in the application of specified product to surfaces of steel water tanks, clarifiers, or other similar equipment at a water treatment plant. Upon request, he shall substantiate this requirement by furnishing a list of references and job completions.

B. Contractor’s superintendent/foreman must have a minimum of ten (10) years of experience with coating potable storage tanks or clarifiers. Superintendent/foreman must be on-site while the work indicated within this section is underway. Submit a list of recent projects and names of references for those projects.

C. The Contractor shall submit with his bid a written statement by the coatings manufacturer stating that the Contractor is familiar with the materials specified and has workers capable of performing the work specified herein.

D. The personnel performing the work shall be knowledgeable and have the required experience and skill to adequately perform the work for this project, in accordance with SSPC-PA1, “Shop, Field and Maintenance Painting”.

1.5 QUALITY ASSURANCE

A. Personnel: The CONTRACTOR shall have a full complement of personnel, for the proper coordination and expedition of the work, on a continuous basis until the Work is completed and accepted.

B. General: Quality assurance procedures and practices shall be utilized to monitor all phases of surface preparation, application and inspection throughout the duration of the project. Procedures or practices not specifically defined herein may be utilized provided they meet recognized and accepted professional standards and are approved by the Engineer.

C. Surface Preparation: Surface preparation will be based upon comparison with: "Pictorial Surface Preparation Standards for Painting Steel Surfaces: SSPC-VIS 1-89", ASTM D2200-95, "Standard Methods of Evaluating Degree of Rusting on Painted Surfaces", ASTM D 4417-91, Method A and/or Method C or NACE Standard RP0287-87. In all cases, the written standards shall take precedence over the visual standards. In addition, NACE Standard SP0178-91, along with the Visual Comparator, shall be used to verify the surface condition of welds.

D. Application: No coating or paint shall be applied when: 1) the surrounding air temperature or the temperature of the surface to be coated or painted is below the minimum surface temperature for the products specified herein, 2) rain, snow, fog or mist is present, 3) the surface temperature is less than 5ºF above the dew point, 4) the air temperature is expected to drop below the minimum temperature for the products specified within six hours after application of coating. Dewpoint shall be measured by use of an instrument such as a Sling Psychrometer in conjunction with U.S. Department of Commerce Weather Bureau Psychometric Tables. If any of the above conditions are prevalent, coating or painting shall be delayed or postponed until conditions are favorable. The day's coating or painting shall be completed in time to permit the film sufficient drying time prior to damage by atmospheric conditions.

E. Recoat Cycle: The CONTRACTOR shall review the manufacturer's published product/technical data for minimum and maximum recoat times for all the coatings selected for use. No succeeding coat shall be applied prior to the minimum recoat time of the preceding coat. If the maximum recoat window is exceeded prior to the application of the succeeding coat. Then the CONTRACTOR shall prepare the surface in accordance with the manufacturer's published product/technical data prior to the application of the next coat. The cost of this additional surface preparation shall be the CONTRACTOR'S responsibility with no additional cost to the OWNER. The Contract Time shall not be increased as a result of this additional surface preparation.

F. Coating Thickness: Thickness of coatings and paint shall be measured checked according to the procedures outlined in SSPC-PA 2 "Measurement of Dry Film Thickness with Magnetic Gages" with particular attention to section(s) 4.0, 7.8, 7.9, 7.11, 7.13, 7.14, with a non-destructive, magnetic-type thickness gauge that has been calibrated according to the procedures outlined in SSPC-PA 2 "Measurement of Dry Film Thickness with Magnetic Gages" with particular attention to section(s) 3.0, 7.4, 7.5, 7.15. Pass/fail criteria shall require that ninety (90) percent of the spot measurements (average of 3-gauge readings within a 1.5 inch diameter area) be at or above the minimum specified dry film thickness. Of the remaining ten (10) percent of the spot measurements (average of 3-gauge readings within a 1.5 inch diameter area) that are below the minimum specified dry film thickness, they shall be no less than ninety (90) percent of the minimum specified dry film thickness. Areas that fail to meet these criteria shall be corrected at no expense to the Owner. Use of an instrument such as a Tooke Gauge, precision groove grinder, etc. is permitted if a destructive test is deemed necessary by the Engineer and the total Dry Film Thickness (DFT) s less than 50 mils.

G. Holiday (Pinhole) Testing: The integrity of interior coated surfaces shall be tested for holidays in accordance with NACE Standard SP0188. For dry films less than 20 mils, a non-destructive holiday detector shall not exceed 67.5 volts, nor shall destructive holiday detector exceed the voltage recommended by the manufacturer of the coating system. A solution of 1-ounce non-sudsing type wetting agent, such as Kodak Photo-Flo, and 1 gallon of tap water shall be used to perform the holiday testing. For coating thickness at 20 mils and greater, a high voltage Tinker & Rasor AP/W holiday tester shall be used. Contact coating manufacturer for voltage recommendations and curing parameters.

All pinholes and/or holidays shall be marked and repaired in accordance with the manufacturer's printed recommendations and retested. No pinholes or other irregularities will be permitted in the final coating.

H. Inspection Devices: The contractor shall furnish, until final acceptance of coating and painting is accepted, inspection devices in good working condition for detection of holidays and measurement of dry film thickness of coating and paint. The Contractor shall also furnish U.S. Department of Commerce, National Bureau of Standards certified thickness calibration plates and/or plastic shims, depending upon the thickness gauge used, to test the accuracy of dry film thickness gauges and certified instrumentation to test the accuracy of holiday detectors. Dry film gauges and holiday detectors shall be made available for the Engineer's use at all times until final acceptance of application. Holiday detection devices shall be operated in the presence of the Engineer.

I. Inspection: Inspection for this project shall consist of 'hold point' inspections. The Engineer or his representative shall inspect the surface prior to abrasive blasting, after abrasive blasting but prior to application of coating materials, and between subsequent coats of material. Final inspection shall take place after all coatings are applied, but prior to returning the clarifier into service. Contractor will insure that sufficient rigging is in place so that the Engineer or his representative shall be able to conduct the required inspections.

Clarifier Inlet(s)/Sludge Discharge/Slurry Discharge/Outlet Piping/: The CONTRACTOR shall be responsible for assuring that no foreign material including, but not limited to paint, abrasive, rags, or tools enter the clarifier and all its associated appurtenances during the prosecution of the Work. To aid in preventing the entrance of foreign material, the Contractor shall drain the clarifier and shall not be removed until the interior and exterior painting is complete. If an expandable plug is used/inserted into any related piping, the plug shall be placed at approximately 18 in. down in the pipe to allow the proper coating of the inlet/outlet pipe.

J. Warranty Inspection: Warranty inspection shall be conducted as described in Section 5.2 of AWWA D102 during the eleventh month following acceptance of all coating and painting work. All defective work shall be repaired in accordance with this specification and to the satisfaction of the Engineer and/or Owner. The performance of this inspection and/or any remedial work shall not relieve the Contractor of any responsibility for defects in materials or workmanship which may or may not be evident during the inspection.

K. Application and Damages: The materials shall be applied in accordance with the manufacturer's product/technical data and such that the end results are in compliance with these specifications. Application equipment shall be good quality and shall be as recommended by the coating manufacturer. Techniques shall be used which will not cause coating droplets to travel. Spray painting of the exterior surface shall only be utilized when the wind velocity and direction are such that damage will not occur to any other part of the water treatment plant and especially the water being treated. Brush and roller painting of exterior surfaces shall be done only when the wind velocity and direction are such that damage will not occur to any other part of the water treatment plant and especially the water being treated. Prior to the cleaning or painting of any surface, the CONTRACTOR shall present a written plan for review by the OWNER and Engineer concerning how abrasive and or paint damage to any other part of the water treatment plant will be removed. Approval of this plan shall not relieve the CONTRACTOR from the responsibility of settling claims, but is intended as an avenue to expedite and minimize such claims.

1.6 WARRANTY

A. The coatings shall be warranted for five (5) years or manufacturer's standard warranty, whichever is longer, after acceptance of the facility by the OWNER.

1.7 SAFETY AND HEALTH REQUIREMENTS

A. General: In accordance with requirements set forth by regulatory agencies applicable to the construction industry and manufacturer's printed instructions and appropriate technical bulletins and manuals, the Contractor shall provide and require use of personal protective lifesaving equipment for persons working on or about the project site. The Contractor's work forces should comply with the provisions outlined in SSPC-PA-3 "A Guide to Safety in Paint Application".

B. Head and Face Protection and Respiratory Devices: Equipment shall include protective helmets, which shall be worn by all persons while in the vicinity of the work. In addition, workers engaged in or near the work during sandblasting shall wear eye and face protection devices and air purifying half-mask or mouthpiece respirators with appropriate filters. Barrier creams shall be used on any exposed areas of skin.

C. Ventilation: The CONTRACTOR shall furnish, install, and operate the equipment that is necessary to provide forced ventilation to aid curing if required. This does not extend to the contractor's need to provide containment of any airborne particulates of the material being removed or applied. If supplementary heating or dehumidification is required to effect curing, the CONTRACTOR shall furnish, install, and operate the equipment to perform the supplementary heating or dehumidification required at no additional cost to the Owner. The clarifier and related appurtenances shall not be disinfected or filled with water until the interior coatings have cured for period of time as recommended by the paint manufacturer.

D. Sound Levels: Whenever the occupational noise exposure exceeds maximum allowable sound levels, the Contractor shall provide and require the use of approved ear protection devices.

E. Illumination: Adequate illumination shall be provided while work is in progress, including explosion-proof lights and electrical equipment. Whenever required by the Engineer, the Contractor shall provide additional illumination and necessary support to cover all areas to be inspected. The Engineer shall determine the level of illumination required for inspection purposes.

F. Temporary Ladders and Scaffolding: All temporary ladders and scaffolding shall conform to applicable safety requirements. They shall be erected where requested by the Engineer to facilitate inspection and be moved by the Contractor to locations requested by the Engineer.

1.8 PRODUCT DELIVERY, STORAGE & HANDLING

A. All materials shall be brought to the job site in original sealed containers. They shall not be used until the Engineer has inspected the contents and obtained data from information on containers or label. Materials exceeding storage life recommended by the manufacturer shall be rejected.

B. Paint Storage: Paint and solvents shall be stored in a secured climate-controlled facility (trailer, building, etc.). Ambient temperatures shall be maintained between (65 f) sixty-five and (85 f) eighty-five degrees

C. Requirements: Deliver, store, handle, apply, and cure materials in accordance with the manufacturer's published product data, including all requirements listed on the Material Safety Data Sheets (MSDS).

D. Quantity: The amounts delivered shall provide the proper coverage rates taking into account normal application loss and difference in colors due to alternating batch numbers.

E. New Materials: All coating material and thinners shall be new and furnished for this job and shall be delivered from the coating manufacturer to the job site in the original factory sealed containers clearly and property labeled by the coating manufacturer showing the manufacturer's name, product number, type of paint, batch number, and expiration date.

F. Storage: Provide adequate storage facilities. Store coating materials within minimum and maximum ambient temperatures in accordance with 1.03 of this section. The temperature of the coating prior to and during mixing shall be within the range stated in the manufacturer's published product and technical data. The Contractor shall monitor the storage temperature of paint over a 24-hour period prior to use and record the minimum and maximum temperatures to ensure the paint has been stored within the parameters set forth in the contract. The contractor shall remove oily and or solvent soaked rags from the jobsite nightly.

G. Abrasive: All expendable abrasive shall be new and furnished for this job. All abrasive shall be properly stored on skids and covered or stored inside a covered container to protect from rain and weather. Do not allow abrasive to rest directly in contact with the ground.

H. MSDS: Material Safety Data Sheets (MSDS) shall be posted at the job site for each chemical product on the job site, including but not limited to abrasives, coating, thinners, gas, oil, diesel and other solvents, welding materials, flexible sealant material, and disinfecting agents.

1.9 SUBMITTALS

A. Submit sets to the ENGINEER all related products, procedures, or testing that will be required during prosecution of all this project's scope of work. This shall include, but not be limited to:
   1. Product Data

a. Written descriptions and catalog cuts describing each type of abrasive used for interior and exterior surfaces to be blasted. Include technical data sheets to substantiate compliance with specifications.
b. Written description and catalog cuts describing each coating in the system. Information shall include: product delivery, storage, handling, application and curing instructions and limitations. Include technical data sheets to substantiate compliance with specifications.
c. Written description and catalog cuts describing each thinner proposed for use with each coating system. Also include solvent or thinner for use in cleaning paint equipment. Include technical data sheets to substantiate compliance with specifications.
d. Written description and catalog cuts describing the proposed underwater curing epoxy paint for the interior surfaces at the First Anniversary Inspection. Include technical data sheets to substantiate compliance with specifications.

2. Certification:
   a. Provide certification signed by the supplier of the coating attesting that the coating system proposed meets the specifications along with certificates of compliance (COC) or certificates of analysis for each batch of paint used on the project.
   b. Provide certification from the manufacturer that all coatings will not contain more than 0.06% by weight of lead in the cured coating for each coat applied. Certification shall be submitted to the Engineer.
3. Cleanup Procedures:
   a. Prior to the field cleaning or painting of any surface, the Contractor shall present a written plan to the OWNER and Engineer for review concerning how paint and/or abrasive damage to automobiles and property will be handled, including a process for quick removal of the paint or abrasive, and who will do the work. This approval in no way shall relieve the contractor from the responsibility of settling claims for damage, but is intended as an avenue to expedite and minimize said claims.
4. Containment Procedures:
   a. Prior to the field cleaning or painting of any surface, the CONTRACTOR shall present a written plan to the OWNER and ENGINEER for review concerning how spent cleaning debris and/or paint over spray or droplets will be contained/confined to the jobsite and clarifier site during the surface preparation and coating application operations. Reasonable care shall be exercised by the Contractor to prevent damage, nuisance, or hazardous conditions to adjacent or nearby property owners.

1.10 JOB CONDITIONS

A. Painting Environment: All temperature and humidity requirements of the coating manufacturer shall be met. In addition, no painting shall be done when: 1) the relative humidity is greater than 85%; or 2) the temperature of the steel is or expected to be less than five (5) degrees above the dew point temperature during the application and until the coating has cured to resist moisture in accordance with the manufacturer's published product/technical data; 3) the ambient or steel temperature is below fifty (50) degrees Fahrenheit or is expected to drop below that during the initial cure of the coating; or 4) the ambient or steel temperature is above one-hundred (100) degrees Fahrenheit or is expected to increase during the initial cure of the coating.

B. Humidity and Temperature Measuring Equipment: The CONTRACTOR shall have a dry/wet bulb sling psychrometer and a steel temperature measuring device on the job at all times. Readings shall be measured at the beginning and at the end of each painting session and at intervals of two hours or less.

C. Wind Velocity: Wind velocities during the exterior painting shall be compatible for the quality application of the exterior coatings and in compliance with local regulatory requirements. In the event of high winds forecast, the containment system shall not be raised in order to prevent possible damage to the clarifier and surrounding property.

PART 2 - MATERIALS

2.1 ACCEPTABLE MANUFACTURERS

A. Acceptable Manufacturers are listed below:
   1. Tenemec
   2. Carboline
   3. Sherwin William

4. Engineered approved equal

B. Requests for substitution under Engineer approved equal shall include manufacturer's literature for each product giving name, product number, generic type, descriptive information, solids by volume, recommended dry film thickness and certified lab test reports showing results to equal the performance criteria of the products specified herein. In addition, a list of five projects shall be submitted in which each product has been used and rendered satisfactory service.

C. All requests for product substitution shall be made at least 7 days prior to the bid date.

D. Any material savings shall be passed to the owner in the form of a contract dollar reduction.

E. Manufacturer's color charts shall be submitted to the Engineer at least 30 days prior to coating and/or paint application. General Contractor and Painting Contractor shall coordinate work so as to allow sufficient time (normally seven to ten days) for paint to be delivered to the job site.

2.2 GENERAL REQUIREMENTS

A. All materials shall be lead-free as defined by the Consumer Product Safety Act, Part 1303.

B. All zinc dust pigment contained in any zinc-rich material shall meet the requirements of ASTM D 520 Type III with regard to zinc content and purity.

C. All materials for the interior wetted portion of the clarifier shall meet the requirements of ANSI/NSF Standard 61 for potable water contact.

D. All catalyzed polyurethane products shall meet the minimum requirements of SSPC Paint Specification Number 36, Level 3 Performance Level.

E. No products containing MOCHA shall be allowed.

2.3 MATERIAL PREPARATION

A. Mix and thin materials according to manufacturer's latest printed instructions.

B. Do not use materials beyond manufacturer's recommended shelf life.

C. Do not use mixed materials beyond manufacturer's recommended pot life.

D. Do not split kits of multi-component products.

2.4 CLARIFIER INTERIOR (AND BRIDGE WALKWAYS) COATING SYSTEMS

A. High-Build, Zinc/Epoxy System:

1. Surface Preparation Prior to Abrasive Blast Cleaning: Weld flux and spatter shall be removed by power tool cleaning. Sharp projections shall be ground to a smooth contour. All welds shall be ground to a smooth contour as per NACE Standard SP0178, Designation D.
2. Surface Preparation: **SSPC-SP10 Near-White Metal Blast Cleaning**. An angular profile of 2.0 to 2.5 mils as per ASTM D 4417, Method C or NACE Standard RP0287 is required.
3. Tenemec Coating System:

Prime Coat:	Tnemec Series 94-H2O Hydro-Zinc applied at 2.5 to 3.5 mils.
Stripe Coat:	Tnemec Series 21 Epoxyline (bolts, rivets, pits, etc. shall receive stripe coat.
Finish Coats:	Tnemec Series Epoxyline applied at 15-18-mils.

Total dry film thickness shall be a minimum of 19 mils.

4. Carboline

Single Coat Application:	Hydroplate 1100 (finish coat as necessary)
Stripe Coat:	Not applicable
Finish Coat:	As necessary

Total dry film thickness shall be minimum 25-mils

5. Sherwin Williams

Prime Coat:	Corothane I Galvapac 1K Zinc Primer 2.5 to 3.5 mils.
Stripe Coat:	Dura-Plate UFS bolts, rivets, pits, etc. shall receive stripe coat.
Finish Coats:	Dura-Plate UHS (100% Solids) 20 to 30 Mils

Total dry film thickness shall be a minimum of 25 mils.

2.5 CLARIFIER EXTERIOR COATING SYSTEMS

A. Four-Coat Zinc Rich Primer/Epoxy/Polyurethane/Fluoropolymer System:
   1. Surface Preparation: Hand tool cleaning in accordance to SSPC-2 “Hand Cleaning Tools”. Remove all loose rust, mill scale, coating or other contaminants. Use non-powered tools to remove only loose material.
   2. Tenemec Coating System:

Prime Coat:	Tnemec Series 27WB applied at 4-6 mils.
Intermediate Coat:	Tnemec Series 66 Epoxoline 6-8-mils
Finish Coats:	Tnemec Series 1095 Endura Shield at 3-5-mils.

Total dry film thickness shall be a minimum of 15 mils.

   3. Carboline Coating System

Prime Coat:	Carboguard 635 applied at 4 to 6-mils
Intermediate Coat:	Carboguard 635 applied at 4 to 6-mils
Finish Coats:	Carbothane 134 HG applied to 2-3-mils

Total dry film thickness shall be minimum 10 to 15-mils

   4. Sherwin Williams

Prime Coat:	Macropoxy 646 FC applied at 3-4-mils
Intermediate Coat:	As necessary
Finish Coat:	Sher-Loxane 900 or equal applied at 4-6 mils.

Total dry film thickness shall be a minimum of 15 mils.

PART 3 - EXECUTION

3.1 GENERAL

A. All surface preparation, coating and painting shall conform to applicable standards of the Society for Protective Coatings, NACE International and the manufacturer's printed instructions. Materials applied to the surface prior to the approval of the Engineer shall be removed and re-applied to the satisfaction of the Engineer at the expense of the contractor.

B. All work shall be performed by skilled craftsmen qualified to perform the required work in a manner comparable with the best standards of practice. Continuity of personnel shall be coordinated with the Engineer.

C. The Contractor shall provide a supervisor at the work site during cleaning and application operations. The supervisor shall have the authority to sign change orders, coordinate work and make decisions pertaining to the fulfillment of the contract.

D. Dust, dirt, oil, grease or any foreign matter that will affect the adhesion or durability of the coating or paint must be removed by washing with clean rags dipped in an approved cleaning solvent and wiped dry with clean rags.

E. Coating and painting systems include surface preparation, prime coating and finish coatings. Unless otherwise approved in writing by the Engineer, prime coating shall be field applied. Where prime coatings are shop applied, the Contractor shall instruct suppliers to provide the prime coat compatible with the specified finish coat. Any off-site work which does not conform to this specification is subjected to damage during transportation, construction or installation shall be thoroughly cleaned and touched-up in the field as directed by the Engineer. The Contractor shall use repair procedures which insure the complete protection of all adjacent primer. The specified repair method and equipment may include wire-brushing, hand or power tool cleaning, or dry air blast cleaning. In order to prevent injury to surrounding painted surfaces, blast cleaning may require use of lower air pressure, smaller nozzle and/or abrasive blast particles, or shorter blast nozzle distances from surface shielding and masking. If damage is too extensive or uneconomical to touch-up, the entire item shall be blasted and then coated or painted as directed by the Engineer.

F. The Contractor's coating and painting equipment shall be designed for application of materials specified and shall be maintained in first class working condition. Compressors shall have suitable traps and filters to remove water and oils from the air. Contractor's equipment shall be subject to approval of the Engineer.

G. Application of the first coat shall follow immediately after surface preparation and cleaning and stripe coat, if applicable, before rust bloom occurs or the same day, whichever is less. Any cleaned areas not receiving first coat within this period shall be recleaned prior to application of first coat. Use of dehumidification equipment shall be first reviewed by the Engineer and coatings manufacturer prior to deviating from this provision.

H. Prior to assembly, all surfaces made inaccessible after assembly shall be prepared as specified herein and shall receive the coating or paint system specified.

3.2 SURFACE PREPARATION

A. The latest revision of the following surface preparation specifications of the Society for Protective Coatings (SSPC) shall form a part of this specification. The summaries listed below are for informational purposes; consult the actual SSPC specification for full detail.
   1. Solvent Cleaning (SSPC-SP1): Removal of oil, grease, soil and other contaminants by use of solvents, emulsions, cleaning compounds, steam cleaning or similar materials and methods which involve a solvent or cleaning action.
   2. Hand Tool Cleaning (SSPC-SP2): Removal of loose rust, loose mil scale and other detrimental foreign matter to a degree specified by hand chipping, scraping, sanding and wire-brushing
   3. Power Tool Cleaning (SSPC-SP3): Removal of loose rust, loose mil scale and other detrimental foreign matter by power wire-brushing, power impact tools or power sanders.
   4. White Metal Blast Cleaning (SSPC-SP5/NACE No. 1): Air blast cleaning to a gray-white uniform metallic color until each element of surface area is free of all visible residues.
   5. Commercial Blast Cleaning (SSPC-SP6 NACE No. 3): Air blast cleaning until at least two-thirds of each element of surface area is free of all visible residues.
   6. Brush-Off Blast Cleaning (SSPC-SP7 NACE No. 4): Air blast cleaning to remove loose rust, loose mil scale and other detrimental foreign matter to a degree specified.
   7. Near-White Metal Blast Cleaning (SSPC-SP10 NACE No. 2): Air blast cleaning until at least 95% of each element of surface area is free of all visible residues.
   8. Power Tool Cleaning to Bare Metal (SSPC-SP11): Differs from SSPC-SP3 in that it requires more thorough cleaning and a surface profile not less than 1 mil.

B. Slag, weld metal accumulation and spatters not removed by the Fabricator, Erector or Installer shall be removed by chipping and/or grinding. All sharp edges shall be peened, ground or otherwise blunted as required by the Engineer. All grinding and finishing of welds, edges, etc. shall be performed prior to solvent cleaning and abrasive blasting. Welds shall be prepared as per NACE Standard SP0178 for all interior and exterior surfaces:
   1. Butt Welds: Shall be ground smooth and free of all defects, designation “D”.
   2. Lap Welds: Shall be ground smooth and blended., designation “D”.
   3. Fillet Welded Tee Joint: Shall be ground smooth and blended, designation “D”.

C. Field blast cleaning for all surfaces shall be by dry method unless otherwise directed. Blast nozzles shall be venturi-type nozzles with a minimum pressure at the nozzle of 90 psi.

D. Particle size of abrasives used in blast cleaning shall be that which will produce the specified surface profile or in accordance with recommendations of the manufacturer of the specified coating or paint system to be applied.

   If the profile of the blasted steel exceeds the profile specified above, the Contractor shall be required to do one or both of the following:
   1. Reblast the surface using a finer aggregate in order to produce the required profile.
   2. Apply a thicker prime coat, given the limitations of the products being applied, in order to adequately cover the blast profile.

E. Abrasive used in blast cleaning operations shall be new, washed, graded and free of contaminants that would interfere with adhesion of coating or paint and shall not be reused unless specifically approved in writing by the Engineer.

F. During blast cleaning operations, caution shall be exercised to ensure that existing coatings or paint are not exposed to abrasion from blast cleaning.

G. The Contractor shall keep the area of his work and the surrounding environment in a clean condition. He shall not permit blasting materials to accumulate as to constitute a nuisance or hazard to the accomplishment of the work, the operation of the existing facilities or to the surrounding environment.

H. Blast cleaned surfaces shall be cleaned prior to application of specified coatings or paint. All surfaces shall be free of dust, dirt, and other residue resulting from the abrasive blasting operation. No coatings or paint shall be applied over damp or moist surfaces.

I. All welds shall be neutralized with a suitable chemical compatible with the specified coating or paint.

J. Pitted areas on the clarifier interior shall be repaired by either filling with Tnemec Series 215 Surfacing Epoxy or Tnemec Series FC22 Epoxoline (floor) or by welding. Epoxy filler shall be feathered smooth. Filler shall be applied after the prior to the application of the finish coat. No protrusions or spatter will be allowed. Pits deeper than 1/8" shall be filled by welding.

K. Specific Surface Preparation: Surface preparation for the specific system shall be as noted in Sections 2.4, 2.5 and 2.6.

3.3 NON-VISIBLE CONTAMINANTS

A. Surfaces shall be checked in three locations for the presence of chlorides, free iron and sulfates. Clarifiers being rehabilitated shall be tested prior to blasting. If blisters are present in existing clarifiers or related appurtenances, testing shall also be performed after abrasive blasting. These tests are an Iron Test (Fe^{2+}), Chloride Test and Sulfate Test. Testing shall be carried out as per SSPC Technology Guide 15 "Field Methods for Retrieval and Analysis of Soluble Salts on Steel and Other Nonporous Substrates". The maximum limits for these contaminants shall be:
   1. The maximum level of chlorides is 30 milligrams per square meter or 3 micrograms per square centimeter.
   2. The maximum level of sulfates is 100 milligrams per square meter or 10 micrograms per square centimeter.
   3. The maximum level of ferrous ions (Fe^{2+}) is 50 milligrams per square meter or 5 micrograms per square centimeter.
   4. Contamination levels above these limits will require washing and retesting in accordance with Item 2 (below) until the surface is under the allowable limits.

B. If testing shows amounts present in the test solution to be greater than the limits listed herein, the Contractor shall clean the surface of the entire clarifier interior with a 5,000-psi water blast with fine entrained abrasive until the levels in the test solutions are below the maximum acceptable level. Alternate cleaning methods may be allowed with prior approval of the Engineer. Surface shall be re-blasted as specified in 2.4 at no additional cost to the Owner.

C. Contractor shall provide a written statement from paint manufacturer stating that the maximum acceptable levels are not less than those listed herein. Results of the testing shall be provided to the Owner before any coatings are applied.

D. The following test kits are approved for use on this project:
   1. Chlor*Rid Chor*Test Kit
   2. KTA SCAT Test Kit

3. Test kits from other vendors shall be submitted to the Engineer for prior approval before use.

E. When exterior coats are to be applied on subsequent days, or when the shroud is dropped between coats, the previously applied coat of paint shall be thoroughly pressure-washed to remove any fallout and/or salt that may have settled on the surface.

3.4 APPLICATION, GENERAL

A. Coating and paint application shall conform to the requirements of the Society for Protective Coatings Paint Application Specification SSPC-PA1, latest revision, for "Shop, Field and Maintenance Painting".
   1. The thickness of each type coating is essential to the system's integrity.
   2. Dry mil thickness greater than the coating manufacturer's maximum allowable thickness shall be considered unacceptable and shall be removed by the CONTRACTOR at no additional cost to the OWNER at the direction of the OWNER and FIELD INSPECTOR.
   3. The addition of a succeeding coat of a different generic type or formulation to make up for thin preceding coat(s) shall not be allowed. If a thicker finish coat is needed to hide the darker color of the underlying coat on the exterior of the clarifier, a thicker coat may be applied, but it shall not exceed the maximum allowable thickness recommended by the coating manufacturer.
   4. Coating thickness measurement procedures shall be as outlined in SSPC-PA2.
   5. If determined to be in the best interest of the project, the FIELD INSPECTOR may make dry film measurements in excess of the amount prescribed in the SSPC-PA 2.

B. Thinning shall be permitted only as recommended by the manufacturer and approved by the Engineer, and utilizing the thinners stated in Sections 2.4, 2.5 and 2.6.

C. Each application of coating or paint shall be applied evenly, free of brush marks, sags, runs, with no evidence of poor workmanship. Care shall be exercised to avoid lapping on glass or hardware. Coatings and paints shall be sharply cut to lines. Finished surfaces shall be free from defects or blemishes.

D. Protective coverings or drop cloths shall be used to protect floors, fixtures and equipment. Care shall be exercised to prevent coatings or paints from being spattered onto surfaces which are not to be coated or painted. Report to the Engineer surfaces from which materials cannot be satisfactorily removed.

E. When two coats of coating or paint are specified, where possible, the first coat shall contain sufficient approved color additive to act as an indicator of coverage or the two coats must be of contrasting color.

F. Film thickness per coat as specified in Sections 2.4, 2.5 and 2.6 are the minimum required. If roller application is deemed necessary, the Contractor shall apply additional coats as needed to achieve the specified thickness.

G. All material shall be as specified.

3.5 COATING SYSTEMS APPLICATION

A. After completion of surface preparation as specified for the specific system, materials shall be applied as noted in Sections 2.4, 2.5 and 2.6.

B. Care shall be taken to eliminate overspray and dry spray on the clarifier interior. Where such conditions are encountered, the surface shall be cleaned of all over spray and dry spray prior to the application of the succeeding coat.

C. Areas rendered inaccessible shall receive the full coating system prior to erection and/or assembly.

D. Full prime coat may be applied directly over stripe coat while stripe coat is wet.

3.6 DISINFECTION

A. Disinfection of interior surfaces shall be performed in the presence of the Engineer in accordance with all the requirements of applicable AWWA Standards and regulatory agencies.

B. Disinfection shall be performed after protective coatings have been applied to the interior surfaces and allowed to thoroughly cure.

C. Prior to disinfecting, the complete interior shall be washed down with clean water and thoroughly flushed out.

D. All interior surfaces shall be thoroughly washed with a solution having a minimum chlorine content of 50 PPM. Chlorine solution accumulated on the bottom shall be drained to waste. Rinsing with clean water is not required.

3.7 SOLVENT VAPOR REMOVAL

A. All solvent vapors shall be completely removed by suction-type exhaust fans and blowers before returning clarifier into operating service.

B. All solvent vapors will be exhausted both during and after coating application as per AWWA D 102 to allow the proper curing of the coating material.

C. Ventilation shall be continued until such time as the coating has reached “full cure” as specified by the coating manufacturer.

3.8 CLEAN-UP

A. Upon completion of the work, all staging, scaffolding and containers shall be removed from the site or destroyed in a manner approved by the Engineer. Coating or paint spots or oil stains upon adjacent surfaces shall be removed and the jobsite cleaned. All damage to surfaces resulting from the work of this section shall be cleaned, repaired or refinished to the satisfaction of the Engineer at no cost to the Owner.

END OF SECTION

SECTION 46 43 66
CLARIFIER EQUIPMENT

PART 1 - GENERAL

1.1 DESCRIPTION

A. SCOPE OF WORK
   1. Furnish and install the ClariCone® replacement components as described in this Specification and shown on the Plans.

1.2 SUPPLIER

A. This Specification is based on the original ClariCone® solids contact clarifier as supplied by CB&I and CB&I is the pre-qualified Clarifier Supplier.

1.3 STANDARDS, CODES AND GUIDES

A. The materials, designs, fabrication, erection and inspection of the welded steel tank, support structure and foundation, shall conform to the latest edition of the following standards, codes and guides, as they apply to this work.

AISC	American Institute of Steel Construction, Allowable Stress Design
ASME IX	American Society of Mechanical Engineers, Boiler and Pressure Vessel Code, Welding and Brazing Qualifications
ASTM	American Society for Testing and Materials
AWS D1.1	American Welding Society, Structural Welding Code, Steel
AWWA D100	American Water Works Association, Standard for Welded Steel Tanks for Water Storage
NEMA	National Electrical Manufacturers Association
OSHA	Occupational Safety and Health Standards
SSPC-PA1	Steel Structures Painting Council, Paint Application Specification

1.4 SUBMITTALS

A. General:
   1. Provide Shop Drawings, samples, administrative, quality control, and contract closeout submittals in accordance with the requirements of Section 01 33 00, SUBMITTAL PROCEDURES, Section 01 78 23, OPERATIONS AND MAINTENANCE DATA, Section 01 64 00, MANUFACTURER'S SERVICES, and as listed below.

B. Shop Drawings:
   1. Make, model, weight, and horsepower of each equipment assembly.
   2. Complete catalog information, descriptive literature, Specifications, identification of materials of construction.
   3. Performance Data Showing Compliance with Specification Requirements including: Pump curves showing head, flow, horsepower demand, and net positive suction head requirement over the entire operating range.
   4. Detailed Mechanical and Electrical Drawings showing the equipment fabrications and interface with other items include: Dimensions, sizes, and locations of connections to other work, and weights of equipment associated therewith.
   5. Outside utility requirements such as air, water, power, drain, etc., for each component.
   6. Functional description of internal and external instrumentation and controls to be supplied including list of parameters monitored, controlled, or alarmed.
   7. Power and control wiring diagrams, including terminals and numbers.
   8. Factory finish system including epoxy coating system for cast iron and steel components. Include manufacturer's descriptive technical catalog literature and specifications, and hazardous communication data sheets.

9. Instrumentation and control submittals in accordance with Division 13-Special Construction.

C. Provide Quality Control Submittals as Follows:
   1. Operations and Maintenance Data as specified in Section 01 65 00, PRODUCT DELIVERY AND STORAGE REQUIREMENTS.
   2. Manufacturer's Certification of Compliance that the factory finish system is identical to the requirements specified herein.
   3. Manufacturer's Certificate of Proper Installation.
   4. Manufacturer's Training Program.
   5. Equipment Testing and Field Startup Report

1.5 OPERATION AND MAINTENANCE MANUALS

A. Provide manufacturer's Operation and Maintenance Manual(s) (O&M) and Maintenance Summary Form(s) in accordance with OPERATION AND MAINTENANCE DATA in Section 01 78 23.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Product, delivery, storage, and handling should comply with Section 01 65 00, PRODUCT DELIVERY AND STORAGE REQUIREMENTS.

1.7 WARRANTY

A. Equipment warranty requirements shall comply with Section 01 78 36, WARRANTIES.

B. Submit warranty from the equipment manufacturer clearly stipulating that manufacturer's warranty period shall be for two (2) years commencing at **project final acceptance by the Owner**.

PART 2 - PRODUCTS

2.1 GENERAL

A. Furnish and install parts for the two (2) Clari Cone® Clarifiers as shown on the Plans and as specified herein.

2.2 COMPONENTS

A. The ClariCone® replacement components shall include the following:
   1. Replace Flap Gate with hardware for the concentrator cone as highlighted on Plans.
   2. Replace Concentrator Slip Tube Assembly as highlighted Plans.
   3. Replace Concentrator Lift Tube Assembly as highlighted on Plans
   4. Replace Radial Wier Operator Assembly as highlighted on Plans.
   5. Replacd sampling Lines and associated valves as highlighted on Plans.
   6. An option to purchase a replacement Radial Weir Trough as highlighted on Plans.

2.3 GENERAL

A. All painting shall be in accordance with the applicable requirements of the Specifications' finishes or paint sections. Refer to Section 09 90 81 PAINTING AND PROTECTIVE COATING.

PART 3 - EXECUTION

3.1 FABRICATION AND ERECTION

A. Install components in accordance to manufacturer's recommendations.

3.2 START-UP SERVICE

A. Following equipment check-out and when the unit is ready to be put into service, the Clarifier Supplier shall furnish the services of a process engineer for a period not to exceed one (1) day and one (1) trip per clarifier.

END OF SECTION