

PROJECT MANUAL

Water Treatment Plant Equipment Upgrades For the Town of Stanton

Stanton, Tennessee

TDEC ARPA ID # DW-PDC-2

A2H # 22209.02

Bid Date:
July 10, 2024

This project is being supported, in whole or in part, by federal funds awarded to the Town of Stanton by the American Rescue Plan Act.



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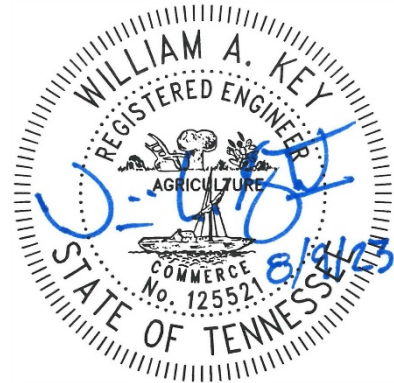
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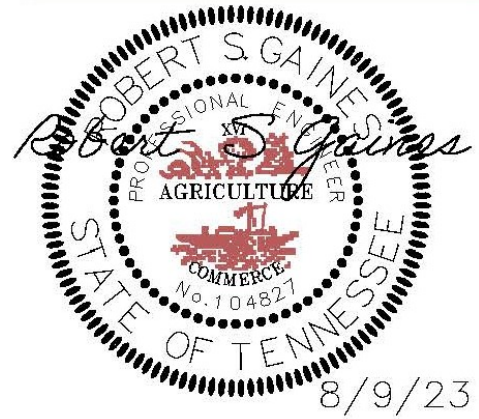
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DESCRIPTION

The following is the list of Project Contract Drawings entitled **Water Treatment Plant Equipment Upgrades** for the Town of Stanton in Stanton, Tennessee, dated August 9, 2023 with Revision dates, if any, as noted.

SHEET NO	SHEET NAME	REV DATE
G0.0	COVER	
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END OF SECTION

Bid Number:	TDEC ARPA # DW-PDC-2
Bid Title:	Water Treatment Plant Equipment Upgrades
Category:	Public Works
Status:	Bidding

Advertisement for Bids

Water Treatment Plant Equipment Upgrades
TDEC ARPA # DW-PDC-2
Stanton, Tennessee

Town of Stanton will be soliciting bids for Water Treatment Plant Equipment Upgrades on the property located at Stanton, Tennessee. The Water Treatment Plant Equipment Upgrades is a Public Works project with several functions for the Stanton, Tennessee community. The Work includes the rehabilitation of one raw water well, installation of new raw water piping from the existing wells, 750 GPM induced draft aerator, clearwell, two high service pumps rated at 750 GPM, new raw water meter, new finished water meter to existing elevated storage tank, new electrical panels, starters, and wiring, and new SCADA system.

A non-mandatory pre-bid conference will be held at 10:00 a.m. on July 2, 2024 at Stanton Municipal Building, 8 Main Street, Stanton, TN 38069.

This project is being supported American Rescue Plan Act, Coronavirus State and Local Recovery Fund grant funding. Therefore, certain restrictions and other federal requirements attach to this opportunity.

Separate sealed bids for Water Treatment Plant Equipment Upgrades will be received by the Stanton Municipal Building, 8 Main Street, Stanton, TN 38069, until **2:00 p.m. on July 10, 2024**, and then at said office publicly opened and read aloud. Any person with disability requiring special accommodations must contact the Town of Stanton no later than 7 days prior to the bid opening.

All bid documents may be examined at the following:

1) TOWN OF STANTON
STANTON MUNICIPAL BUILDING
8 MAIN STREET
STANTON, TN 38069

2) A2H, INC.
3009 DAVIES PLANTATION RD.
LAKELAND, TN 38002
www.a2hplanroom.com

3) BUILDERS EXCHANGE
642 SOUTH COOPER
MEMPHIS, TN 38104
www.memphisbx.com

4) WEST TENNESSEE PLANS ROOM
439 AIRWAYS BLVD.
JACKSON, TN 38301
www.wtplanroom.com

Electronic files may be downloaded free of charge from the A2H Planroom at www.a2hplanroom.com. Hard copy sets of plans and specifications will also be available for purchase on the planroom at the contractor's expense. For questions regarding obtaining the plans and specifications, please email Laurie Smith, Project Coordinator at lauries@a2h.com.

PLEASE NOTE: Official plan holders list will only be the list maintained by **A2H, Inc.** It is the sole responsibility of all plan holders, whether they have received digital downloads or paper copies of the plans and specifications, to periodically check for Addenda which may have been posted on the **A2H Planroom** at www.a2hplanroom.com.

Town of Stanton hereby notifies all bidders that it will affirmatively insure that in any contract entered into pursuant to this advertisement will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, sex, or national origin in consideration for an award. Town of Stanton is an Equal Opportunity Employer. Any contract that uses federal funds to pay for construction work is a "federally assisted construction contract" and must include the equal opportunity clause found in 2 C.F.R. Part 200, unless otherwise stated in 41 C.F.R. Part 60. We encourage all small and minority owned firms and women's business enterprises to participate. No bidder may withdraw his bid within (60) days after the actual date of the opening thereof.

The Copeland "Anti-Kickback" Act is also applicable, which prohibits workers on construction contracts from giving up wages that they are owed. Contractors must not appear on Sam.gov disbarment list.

A detailed listing of all subcontractors shall be provided by the Bidder. In accordance with the Contract Documents, documentation that the prospective General Contractor and its subcontractors meet minimum qualifications shall be provided and submitted. Subcontractors must also not appear on Sam.gov disbarment list. Mark-ups on subcontractor work or Cost Plus Overhead will be disallowed for reimbursement.

A bid bond or certified check for **five percent (5%) of the total bid amount** must accompany each bid. The successful bidder will be required to furnish a performance bond in the amount of his bid and shall, before entering on the work of said contract, be licensed as a contractor of the Town of Stanton.

The owner reserves the right to waive any informalities or to reject any or all bids.

Publication Date

June 12, 2024

Bid Opening Date/Time

July 10, 2024, 2:00 p.m.

INSTRUCTIONS TO BIDDERS FOR CONSTRUCTION CONTRACT

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ARTICLE 1—DEFINED TERMS

- 1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:
- A. *Issuing Office*—The office from which the Bidding Documents are to be issued, and which registers plan holders.

ARTICLE 2—BIDDING DOCUMENTS

- 2.01 Bidder shall obtain a complete set of Bidding Requirements and proposed Contract Documents (together, the Bidding Documents). See the Agreement for a list of the Contract Documents. It is Bidder's responsibility to determine that it is using a complete set of documents in the preparation of a Bid. Bidder assumes sole responsibility for errors or misinterpretations resulting from the use of incomplete documents, by Bidder itself or by its prospective Subcontractors and Suppliers.
- 2.02 Bidding Documents are made available for the sole purpose of obtaining Bids for completion of the Project and permission to download or distribution of the Bidding Documents does not confer a license or grant permission or authorization for any other use. Authorization to download documents, or other distribution, includes the right for plan holders to print documents solely for their use, and the use of their prospective Subcontractors and Suppliers, provided the plan holder pays all costs associated with printing or reproduction. Printed documents may not be re-sold under any circumstances.
- 2.03 Owner has established a Bidding Documents Website as indicated in the Advertisement or invitation to bid. Owner recommends that Bidder register as a plan holder with the Issuing Office at such website, and obtain a complete set of the Bidding Documents from such website. Bidders may rely that sets of Bidding Documents obtained from the Bidding Documents Website are complete, unless an omission is blatant. Registered plan holders will receive Addenda issued by Owner.
- 2.04 Bidder may register as a plan holder and obtain complete sets of Bidding Documents, in the number and format stated in the Advertisement or invitation to bid, from the Issuing Office. Bidders may rely that sets of Bidding Documents obtained from the Issuing Office are complete, unless an omission is blatant. Registered plan holders will receive Addenda issued by Owner.
- 2.05 Plan rooms (including construction information subscription services, and electronic and virtual plan rooms) may distribute the Bidding Documents, or make them available for examination. Those prospective bidders that obtain an electronic (digital) copy of the Bidding Documents from a plan room are encouraged to register as plan holders from the Bidding Documents Website or Issuing Office. Owner is not responsible for omissions in Bidding Documents or other documents obtained from plan rooms, or for a Bidder's failure to obtain Addenda from a plan room.
- 2.06 *Electronic Documents*
- A. When the Bidding Requirements indicate that electronic (digital) copies of the Bidding Documents are available, such documents will be made available to the Bidders as Electronic Documents in the manner specified.
1. Bidding Documents will be provided in Adobe PDF (Portable Document Format) (.pdf) that is readable by Adobe Acrobat Reader Version 6.0 or later. It is the intent of the Engineer and Owner that such Electronic Documents are to be exactly representative of the paper copies of the documents. However, because the Owner and Engineer cannot totally control

the transmission and receipt of Electronic Documents nor the Contractor's means of reproduction of such documents, the Owner and Engineer cannot and do not guarantee that Electronic Documents and reproductions prepared from those versions are identical in every manner to the paper copies.

- B. Unless otherwise stated in the Bidding Documents, the Bidder may use and rely upon complete sets of Electronic Documents of the Bidding Documents, described in Paragraph 2.06.A above. However, Bidder assumes all risks associated with differences arising from transmission/receipt of Electronic Documents versions of Bidding Documents and reproductions prepared from those versions and, further, assumes all risks, costs, and responsibility associated with use of the Electronic Documents versions to derive information that is not explicitly contained in printed paper versions of the documents, and for Bidder's reliance upon such derived information.
- C. After the Contract is awarded, the Owner will provide or direct the Engineer to provide for the use of the Contractor documents that were developed by Engineer as part of the Project design process, as Electronic Documents in native file formats.
 - 1. Release of such documents will be solely for the convenience of the Contractor. No such document is a Contract Document.
 - 2. Unless the Contract Documents explicitly identify that such information will be available to the Successful Bidder (Contractor), nothing herein will create an obligation on the part of the Owner or Engineer to provide or create such information, and the Contractor is not entitled to rely on the availability of such information in the preparation of its Bid or pricing of the Work. In all cases, the Contractor shall take appropriate measures to verify that any electronic/digital information provided in Electronic Documents is appropriate and adequate for the Contractor's specific purposes.
 - 3. In no case will the Contractor be entitled to additional compensation or time for completion due to any differences between the actual Contract Documents and any related document in native file format.

ARTICLE 3—QUALIFICATIONS OF BIDDERS

- 3.01 *Bidder is to submit the following information with its Bid to demonstrate Bidder's qualifications to perform the Work:*
 - A. A written statement that Bidder is authorized to do business in the state where the Project is located, or a written certification that Bidder will obtain such authority prior to the Effective Date of the Contract.
 - B. Bidder's state or other contractor license number, if applicable.
 - C. Subcontractor and Supplier qualification information.
 - D. Other required information regarding qualifications.
- 3.02 A Bidder's failure to submit required qualification information within the times indicated may disqualify Bidder from receiving an award of the Contract.
- 3.03 No requirement in this Article 3 to submit information will prejudice the right of Owner to seek additional pertinent information regarding Bidder's qualifications.

ARTICLE 4—PRE-BID CONFERENCE

- 4.01 A non-mandatory pre-bid conference will held at Stanton Municipal Building, 8 Main Street, Stanton, TN 38069 on July 2, 2024 at 10:00 a.m..

ARTICLE 5—SITE AND OTHER AREAS; EXISTING SITE CONDITIONS; EXAMINATION OF SITE; OWNER'S SAFETY PROGRAM; OTHER WORK AT THE SITE

5.01 *Site and Other Areas*

- A. The Site is identified in the Bidding Documents. By definition, the Site includes rights-of-way, easements, and other lands furnished by Owner for the use of the Contractor. Any additional lands required for temporary construction facilities, construction equipment, or storage of materials and equipment, and any access needed for such additional lands, are to be obtained and paid for by Contractor.

5.02 *Existing Site Conditions*

A. *Subsurface and Physical Conditions; Hazardous Environmental Conditions*

1. The Supplementary Conditions identify the following regarding existing conditions at or adjacent to the Site:
 - a. Those reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data.
 - b. Those drawings known to Owner of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data.
 - c. Reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site.
 - d. Technical Data contained in such reports and drawings.
2. Owner will make copies of reports and drawings referenced above available to any Bidder on request. These reports and drawings are not part of the Contract Documents, but the Technical Data contained therein upon whose accuracy Bidder is entitled to rely, as provided in the General Conditions, has been identified and established in the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any Technical Data or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.
3. If the Supplementary Conditions do not identify Technical Data, the default definition of Technical Data set forth in Article 1 of the General Conditions will apply.

- B. *Underground Facilities:* Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05 of the General Conditions, and not in the drawings referred to in Paragraph 5.02.A of these Instructions to Bidders. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.

5.03 *Other Site-related Documents*

- A. No other Site-related documents are available.

5.04 *Site Visit and Testing by Bidders*

- A. Bidder is required to visit the Site and conduct a thorough visual examination of the Site and adjacent areas. During the visit the Bidder must not disturb any ongoing operations at the Site.
- B. Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.
- C. On request, and to the extent Owner has control over the Site, and schedule permitting, the Owner will provide Bidder general access to the Site to conduct such additional examinations, investigations, explorations, tests, and studies as Bidder deems necessary for preparing and submitting a successful Bid. Owner will not have any obligation to grant such access if doing so is not practical because of existing operations, security or safety concerns, or restraints on Owner's authority regarding the Site. Bidder is responsible for establishing access needed to reach specific selected test sites.
- D. Bidder must comply with all applicable Laws and Regulations regarding excavation and location of utilities, obtain all permits, and comply with all terms and conditions established by Owner or by property owners or other entities controlling the Site with respect to schedule, access, existing operations, security, liability insurance, and applicable safety programs.
- E. Bidder must fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.

5.05 *Owner's Safety Program*

- A. Site visits and work at the Site may be governed by an Owner safety program. If an Owner safety program exists, it will be noted in the Supplementary Conditions.

5.06 *Other Work at the Site*

- A. Reference is made to Article 8 of the Supplementary Conditions for the identification of the general nature of other work of which Owner is aware (if any) that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) and relates to the Work contemplated by these Bidding Documents. If Owner is party to a written contract for such other work, then on request, Owner will provide to each Bidder access to examine such contracts (other than portions thereof related to price and other confidential matters), if any.

ARTICLE 6—BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

6.01 *Express Representations and Certifications in Bid Form, Agreement*

- A. The Bid Form that each Bidder will submit contains express representations regarding the Bidder's examination of Project documentation, Site visit, and preparation of the Bid, and certifications regarding lack of collusion or fraud in connection with the Bid. Bidder should review these representations and certifications, and assure that Bidder can make the representations and certifications in good faith, before executing and submitting its Bid.
- B. If Bidder is awarded the Contract, Bidder (as Contractor) will make similar express representations and certifications when it executes the Agreement.

ARTICLE 7—INTERPRETATIONS AND ADDENDA

- 7.01 Owner on its own initiative may issue Addenda to clarify, correct, supplement, or change the Bidding Documents.
- 7.02 Bidder shall submit all questions about the meaning or intent of the Bidding Documents to Engineer in writing. Contact information and submittal procedures for such questions are as follows:
- A. Submit all questions via email to Laurie Smith, Project Coordinator (lauries@a2h.com).
- 7.03 Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda delivered to all registered plan holders. Questions received less than seven days prior to the date for opening of Bids may not be answered.
- 7.04 Only responses set forth in an Addendum will be binding. Oral and other interpretations or clarifications will be without legal effect. Responses to questions are not part of the Contract Documents unless set forth in an Addendum that expressly modifies or supplements the Contract Documents.

ARTICLE 8—BID SECURITY

- 8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of **five percent (5%)** of Bidder's maximum Bid price (determined by adding the base bid and all alternates) and in the form of a Bid bond issued by a surety meeting the requirements of Paragraph 6.01 of the General Conditions. Such Bid bond will be issued in the form included in the Bidding Documents.
- 8.02 The Bid security of the apparent Successful Bidder will be retained until Owner awards the contract to such Bidder, and such Bidder has executed the Contract, furnished the required Contract security, and met the other conditions of the Notice of Award, whereupon the Bid security will be released. If the Successful Bidder fails to execute and deliver the Contract and furnish the required Contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited, in whole in the case of a penal sum bid bond, and to the extent of Owner's damages in the case of a damages-form bond. Such forfeiture will be Owner's exclusive remedy if Bidder defaults.
- 8.03 The Bid security of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of 7 days after the Effective Date of the Contract or 61 days after the Bid opening, whereupon Bid security furnished by such Bidders will be released.
- 8.04 Bid security of other Bidders that Owner believes do not have a reasonable chance of receiving the award will be released within 7 days after the Bid opening.

ARTICLE 9—CONTRACT TIMES

- 9.01 The number of days within which, or the dates by which, the Work is to be eady for final payment, are set forth in the Agreement.
- 9.02 Provisions for liquidated damages, if any, for failure to timely attain completion of the Work in readiness for final payment, are set forth in the Agreement.

ARTICLE 10—SUBSTITUTE AND "OR EQUAL" ITEMS

- 10.01 The Contract for the Work, as awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents, and those "or-equal" or substitute or materials and equipment subsequently approved by Engineer prior to the submittal of Bids and identified by Addendum. No

item of material or equipment will be considered by Engineer as an “or-equal” or substitute unless written request for approval has been submitted by Bidder and has been received by Engineer within 10 days of the issuance of the Advertisement for Bids or invitation to Bidders. Each such request must comply with the requirements of Paragraphs 7.05 and 7.06 of the General Conditions, and the review of the request will be governed by the principles in those paragraphs. The burden of proof of the merit of the proposed item is upon Bidder. Engineer’s decision of approval or disapproval of a proposed item will be final. If Engineer approves any such proposed item, such approval will be set forth in an Addendum issued to all registered Bidders. Bidders cannot rely upon approvals made in any other manner.

- 10.02 All prices that Bidder sets forth in its Bid will be based on the presumption that the Contractor will furnish the materials and equipment specified or described in the Bidding Documents, as supplemented by Addenda. Any assumptions regarding the possibility of post-Bid approvals of “or-equal” or substitution requests are made at Bidder’s sole risk.

ARTICLE 11—SUBCONTRACTORS, SUPPLIERS, AND OTHERS

- 11.01 A Bidder must be prepared to retain specific Subcontractors and Suppliers for the performance of the Work if required to do so by the Bidding Documents or in the Specifications. If a prospective Bidder objects to retaining any such Subcontractor or Supplier and the concern is not relieved by an Addendum, then the prospective Bidder should refrain from submitting a Bid.
- 11.02 The apparent Successful Bidder, and any other Bidder so requested, must submit to Owner a list of the Subcontractors or Suppliers proposed within five days after Bid opening:
- 11.03 If requested by Owner, such list must be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor or Supplier. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor or Supplier, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit an acceptable substitute, in which case apparent Successful Bidder will submit a substitute, Bidder’s Bid price will be increased (or decreased) by the difference in cost occasioned by such substitution, and Owner may consider such price adjustment in evaluating Bids and making the Contract award.
- 11.04 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors and Suppliers. Declining to make requested substitutions will constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor or Supplier, so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to subsequent revocation of such acceptance as provided in Paragraph 7.07 of the General Conditions.

ARTICLE 12—PREPARATION OF BID

- 12.01 The Bid Form is included with the Bidding Documents.
- A. All blanks on the Bid Form must be completed, either in ink or typewritten, and the Bid Form signed in ink. Erasures or alterations must be initialed in ink by the person signing the Bid Form. A Bid price must be indicated for each section, Bid item, alternate, adjustment unit price item, and unit price item listed therein.

- B. If the Bid Form expressly indicates that submitting pricing on a specific alternate item is optional, and Bidder elects to not furnish pricing for such optional alternate item, then Bidder may enter the words “No Bid” or “Not Applicable.”
- 12.02 If Bidder has obtained the Bidding Documents as Electronic Documents, then Bidder shall prepare its Bid on a paper copy of the Bid Form printed from the Electronic Documents version of the Bidding Documents. The printed copy of the Bid Form must be clearly legible, printed on 8½ inch by 11-inch paper and as closely identical in appearance to the Electronic Document version of the Bid Form as may be practical. The Owner reserves the right to accept Bid Forms which nominally vary in appearance from the original paper version of the Bid Form, providing that all required information and submittals are included with the Bid.
- 12.03 A Bid by a corporation must be executed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate address and state of incorporation must be shown.
- 12.04 A Bid by a partnership must be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership must be shown.
- 12.05 A Bid by a limited liability company must be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm must be shown.
- 12.06 A Bid by an individual must show the Bidder’s name and official address.
- 12.07 A Bid by a joint venture must be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The joint venture must have been formally established prior to submittal of a Bid, and the official address of the joint venture must be shown.
- 12.08 All names must be printed in ink below the signatures.
- 12.09 The Bid must contain an acknowledgment of receipt of all Addenda, the numbers of which must be filled in on the Bid Form.
- 12.10 Postal and e-mail addresses and telephone number for communications regarding the Bid must be shown.
- 12.11 The Bid must contain evidence of Bidder’s authority to do business in the state where the Project is located, or Bidder must certify in writing that it will obtain such authority within the time for acceptance of Bids and attach such certification to the Bid.
- 12.12 If Bidder is required to be licensed to submit a Bid or perform the Work in the state where the Project is located, the Bid must contain evidence of Bidder’s licensure, or Bidder must certify in writing that it will obtain such licensure within the time for acceptance of Bids and attach such certification to the Bid. Bidder’s state contractor license number, if any, must also be shown on the Bid Form.

ARTICLE 13—BASIS OF BID

13.01 *Lump Sum*

- A. Bidders must submit a Bid on a lump sum basis as set forth in the Bid Form.

13.02 *Allowances*

- A. For cash allowances the Bid price must include such amounts as the Bidder deems proper for Contractor's overhead, costs, profit, and other expenses on account of cash allowances, if any,

named in the Contract Documents, in accordance with Paragraph 13.02.B of the General Conditions.

ARTICLE 14—SUBMITTAL OF BID

- 14.01 The Bidding Documents include one separate unbound copy of the Bid Form, and, if required, the Bid Bond Form. The unbound copy of the Bid Form is to be completed and submitted with the Bid security and the other documents required to be submitted under the terms of Article 2 of the Bid Form.
- 14.02 A Bid must be received no later than the date and time prescribed and at the place indicated in the Advertisement or invitation to bid and must be enclosed in a plainly marked package with the Project title, and, if applicable, the designated portion of the Project for which the Bid is submitted, the name and address of Bidder, and must be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid must be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED." A mailed Bid must be addressed to the location designated in the Advertisement.
- 14.03 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened.

ARTICLE 15—MODIFICATION AND WITHDRAWAL OF BID

- 15.01 An unopened Bid may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.
- 15.02 If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 15.01 and submit a new Bid prior to the date and time for the opening of Bids.
- 15.03 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, the Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid, the Bidder will be disqualified from further bidding on the Work.

ARTICLE 16—OPENING OF BIDS

- 16.01 Bids will be opened at the time and place indicated in the advertisement or invitation to bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.

ARTICLE 17—BIDS TO REMAIN SUBJECT TO ACCEPTANCE

- 17.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

ARTICLE 18—EVALUATION OF BIDS AND AWARD OF CONTRACT

- 18.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner also reserves the right to waive all minor Bid informalities not involving price, time, or changes in the Work.
- 18.02 Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible.
- 18.03 If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, whether in the Bid itself or in a separate communication to Owner or Engineer, then Owner will reject the Bid as nonresponsive.
- 18.04 If Owner awards the contract for the Work, such award will be to the responsible Bidder submitting the lowest responsive Bid.
- 18.05 *Evaluation of Bids*
- A. In evaluating Bids, Owner will consider whether the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.
 - B. In the comparison of Bids, alternates will be applied in the same order of priority as listed in the Bid Form. To determine the Bid prices for purposes of comparison, Owner will announce to all bidders a “Base Bid plus alternates” budget after receiving all Bids, but prior to opening them. For comparison purposes alternates will be accepted, following the order of priority established in the Bid Form, until doing so would cause the budget to be exceeded. After determination of the Successful Bidder based on this comparative process and on the responsiveness, responsibility, and other factors set forth in these Instructions, the award may be made to said Successful Bidder on its base Bid and any combination of its additive alternate Bids for which Owner determines funds will be available at the time of award.
 - C. For the determination of the apparent low Bidder when unit price bids are submitted, Bids will be compared on the basis of the total of the products of the estimated quantity of each item and unit price Bid for that item, together with any lump sum items.
- 18.06 In evaluating whether a Bidder is responsible, Owner will consider the qualifications of the Bidder and may consider the qualifications and experience of Subcontractors and Suppliers proposed for those portions of the Work for which the identity of Subcontractors and Suppliers must be submitted as provided in the Bidding Documents.
- 18.07 Owner may conduct such investigations as Owner deems necessary to establish the responsibility and qualifications of Bidders and any proposed Subcontractors or Suppliers.

ARTICLE 19—BONDS AND INSURANCE

- 19.01 Article 6 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner’s requirements as to performance and payment bonds, other required bonds (if any), and insurance. When the Successful Bidder delivers the executed Agreement to Owner, it must be accompanied by required bonds and insurance documentation.

19.02 Article 8, Bid Security, of these Instructions, addresses any requirements for providing bid bonds as part of the bidding process.

ARTICLE 20—SIGNING OF AGREEMENT

20.01 When Owner issues a Notice of Award to the Successful Bidder, it will be accompanied by the unexecuted counterparts of the Agreement along with the other Contract Documents as identified in the Agreement. Within 15 days thereafter, Successful Bidder must execute and deliver the required number of counterparts of the Agreement and any bonds and insurance documentation required to be delivered by the Contract Documents to Owner. Within 10 days thereafter, Owner will deliver one fully executed counterpart of the Agreement to Successful Bidder, together with printed and electronic copies of the Contract Documents as stated in Paragraph 2.02 of the General Conditions.

BID FORM FOR CONSTRUCTION CONTRACT

The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

ARTICLE 1—OWNER AND BIDDER

- 1.01 This Bid is submitted to: Stanton Municipal Building, 8 Main Street, Stanton, TN 38069
- 1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2—ATTACHMENTS TO THIS BID

- 2.01 The following documents are submitted with and made a condition of this Bid:
 - A. Required Bid security;
 - B. List of Proposed Subcontractors;
 - C. List of Proposed Suppliers;
 - D. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such authority within the time for acceptance of Bids;
 - E. Contractor’s license number as evidence of Bidder’s State Contractor’s License or a covenant by Bidder to obtain said license within the time for acceptance of Bids;

ARTICLE 3—BASIS OF BID

- 3.01 *Lump Sum Bids*
 - A. Bidder will complete the Work in accordance with the Contract Documents for the following lump sum price:
 - 1. Lump Sum Price (Single Lump Sum):

Lump Sum Bid Price for Water Treatment Plant Equipment Upgrades, complete in place.	\$
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ARTICLE 4—TIME OF COMPLETION

- 4.01 Bidder agrees that the Work will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.
- 4.02 Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 5—BIDDER’S ACKNOWLEDGEMENTS: ACCEPTANCE PERIOD, INSTRUCTIONS, AND RECEIPT OF ADDENDA

5.01 *Bid Acceptance Period*

- A. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

5.02 *Instructions to Bidders*

- A. Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security.

5.03 *Receipt of Addenda*

- A. Bidder hereby acknowledges receipt of the following Addenda:

Addendum Number	Addendum Date

ARTICLE 6—BIDDER’S REPRESENTATIONS AND CERTIFICATIONS

6.01 *Bidder’s Representations*

- A. In submitting this Bid, Bidder represents the following:
 1. Bidder has examined and carefully studied the Bidding Documents, including Addenda.
 2. Bidder has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
 3. Bidder is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work, including all Domestic Preference requirements.
 4. Bidder has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, with respect to the Technical Data in such reports and drawings.
 5. Bidder has carefully studied the reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, with respect to Technical Data in such reports and drawings.
 6. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, if selected as Contractor; and (c) Bidder’s (Contractor’s) safety precautions and programs.
 7. Based on the information and observations referred to in the preceding paragraph, Bidder agrees that no further examinations, investigations, explorations, tests, studies, or data are

necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.

8. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
9. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
10. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
11. The submission of this Bid constitutes an incontrovertible representation by Bidder that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

6.02 *Bidder's Certifications*

A. The Bidder certifies the following:

1. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation.
2. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid.
3. Bidder has not solicited or induced any individual or entity to refrain from bidding.
4. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 8.02.A:
 - a. Corrupt practice means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process.
 - b. Fraudulent practice means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition.
 - c. Collusive practice means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels.
 - d. Coercive practice means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

BIDDER hereby submits this Bid as set forth above:

Bidder:

(typed or printed name of organization)

By:

(individual's signature)

Name:

(typed or printed)

Title:

(typed or printed)

Date:

(typed or printed)

If Bidder is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.

Attest:

(individual's signature)

Name:

(typed or printed)

Title:

(typed or printed)

Date:

(typed or printed)

Address for giving notices: _____

Bidder's Designated Contact:

Name:

(typed or printed)

Title:

(typed or printed)

Phone:

Email:

Address:

Bidder's Contractor License No.: (if applicable) _____

BID BOND (PENAL SUM FORM)

Bidder Name: Address <i>(principal place of business)</i> :	Surety Name: Address <i>(principal place of business)</i> :
Owner Name: Town of Stanton Address <i>(principal place of business)</i> : Stanton Municipal Building 8 Main Street Stanton, TN 38069	Bid Project <i>(name and location)</i> : Water Treatment Plant Equipment Upgrades Bid Due Date: July 10, 2024
Bond Penal Sum: Date of Bond:	
Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth in this Bid Bond, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.	
Bidder	Surety
<i>(Full formal name of Bidder)</i>	<i>(Full formal name of Surety) (corporate seal)</i>
By: _____ <i>(Signature)</i>	By: _____ <i>(Signature) (Attach Power of Attorney)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
Attest: _____ <i>(Signature)</i>	Attest: _____ <i>(Signature)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
<i>Notes: (1) Note: Addresses are to be used for giving any required notice. (2) Provide execution by any additional parties, such as joint venturers, if necessary.</i>	

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond will be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder occurs upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation will be null and void if:
 - 3.1. Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
 - 3.2. All Bids are rejected by Owner, or
 - 3.3. Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions does not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.
6. No suit or action will be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety, and in no case later than one year after the Bid due date.
7. Any suit or action under this Bond will be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder must be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Postal Service registered or certified mail, return receipt requested, postage pre-paid, and will be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond will be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute governs and the remainder of this Bond that is not in conflict therewith continues in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

ACKNOWLEDGEMENT REGARDING BIDDER SAM REGISTRATION

Contractors procured directly by grantees, sub-grantees, and/or sub-recipients of Coronavirus State and Local Fiscal Recovery Fund (SLFRF) and American Rescue Plan Act (ARPA) funds, are required to have an active registration in the System of Award Management (SAM). This document shall be completed and submitted as part of the bid proposal.

1. By submitting this proposal, the prospective bidder certifies that it has an active registration in SAM that is not set to expire within the next 90 days.
2. By submitting this proposal, the prospective bidder certifies neither it, its principals nor affiliates, is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.
3. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that an erroneous certification was rendered, in addition to other remedies available to the Federal Government, the Department or agency with which this transaction originated may pursue available remedies.
4. Further, the prospective bidder shall provide immediate written notice to the person to which this proposal is submitted if at any time the Participant learns that this certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
5. By submitting this proposal, it is agreed that should the proposed covered transaction be entered into, the prospective bidder will not knowingly enter into any lower-tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction unless authorized by the agency with which this transaction originated.
6. It is further agreed that by submitting this proposal, the prospective bidder will include Certification of Subcontractor Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion without modification, in all lower-tier covered transactions and in all solicitations for lower-tier covered transactions.

Provide the following information as detailed in the prospective bidder's SAM registration:

Entity Name _____

Address _____

City: _____ State: _____ Zip: _____

SAM Entity ID: _____ Expiration Date: _____

Active Exclusions: Yes No

**CERTIFICATION OF BIDDER REGARDING
EQUAL EMPLOYMENT OPPORTUNITY**

This certification is required pursuant to Executive Order 11246 (30 F. R. 12319-25). The implementing rules and regulations provide that any bidder or prospective contractor, or any of their proposed subcontractors, shall state as an initial part of the bid or negotiations of the contract whether it has participated in any previous contract or subcontract subject to the equal opportunity clause; and, if so, whether it has filed all compliance reports due under applicable instructions.

Where the certification indicates that the bidder has not filed a compliance report due under applicable instructions, such bidder shall be required to submit a compliance report within seven calendar days after bid opening. No contract shall be awarded unless such report is submitted.

Certification by Bidder

Bidder/Firm: _____

Address: _____

City: _____ State _____ Zip _____

- 1. Bidder has participated in a previous contract or subcontract subject to the Equal Opportunity Clause. Yes No
- 2. Compliance reports were required to be filed in connection with such contract or subcontract. Yes No
- 3. Bidder has filed all compliance reports due under applicable instructions, including SF-100. Yes No None Req.
- 4. Have you ever been or are you being considered for sanction due to violation of Executive Order 11246, as amended? Yes No

Bidder Name: _____

Title: _____

Signature: _____

Date: _____

DRUG-FREE WORKPLACE AFFIDAVIT

STATE OF _____

COUNTY OF _____

The undersigned, principal officer of _____, an employer of five (5) or more employees contracting with _____ government to provide construction services, hereby states under oath as follows:

1. The undersigned is a principal officer of _____ (hereinafter referred to as the "Company"), and is duly authorized to execute this Affidavit on behalf of the Company.
2. The Company submits this Affidavit pursuant to T.C.A. § 50-9-113, which requires each employer with no less than five (5) employees receiving pay who contracts with the state or any local government to provide construction services to submit an affidavit stating that such employer has a drug-free workplace program that complies with Title 50, Chapter 9, of the Tennessee Code Annotated.
3. The Company is in compliance with T.C.A. § 50-9-113.

Further affiant saith not.

Principal Officer

STATE OF _____

COUNTY OF _____

Before me personally appeared _____, with whom I am personally acquainted (or proved to me on the basis of satisfactory evidence), and who acknowledged that such person executed the foregoing affidavit for the purposes therein contained.

Witness my hand and seal at office this _____ day of _____, 20__.

Notary Public

My commission expires: _____

**STATEMENT OF COMPLIANCE CERTIFICATE
ILLEGAL IMMIGRANTS**

EACH CONTRACTOR BIDDING SHALL FILL IN AND SIGN THE FOLLOWING

This is to certify that _____
have fully complied with all the requirements of Chapter No. 878 (House Bill No. 111 and
Senate Bill No. 411) which serves to amend Tennessee Code Annotated Title 12, Chapter 4,
Part I, attached herein for reference.

- *All Bidders for construction services on this project shall be required to submit an affidavit (by executing this compliance document) as part of their bid, that attests that such Bidder shall comply with requirements of T.C.A. § 12-3-309.*

Name: _____ Title: _____

Signature: _____ Date: _____

STATE OF _____

COUNTY OF _____

Before me personally appeared _____, with whom I am personally acquainted (or proved to me on the basis of satisfactory evidence), and who acknowledged that such person executed the foregoing affidavit for the purposes therein contained.

Witness my hand and seal at office this _____ day of _____, 20____.

Notary Public

My commission expires: _____



STATE OF TENNESSEE

BYRD ANTI-LOBBYING AMENDMENT CERTIFICATION

Contractors who apply or bid for an award of \$100,000 or more shall file the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, officer or employee of Congress, or an employee of a Member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 U.S.C. § 1352.

Each tier shall also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the recipient who in turn will forward the certification(s) to the awarding agency.

APPENDIX A, 44 C.F.R. PART 18 – CERTIFICATION REGARDING LOBBYING – REQUIRED FOR CONTRACTS OVER \$100,000 *Certification for Contracts, Grants, Loans, and Cooperative Agreements*

The undersigned certifies, to the best of his or her knowledge and belief, that:

- No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
- The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

The Contractor certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. Chap. 38, Administrative Remedies for False Claims and Statements, apply to this certification and disclosure, if any.

Signature of Authorized Representative	Date
Printed Name and Title	Phone Number / Email Address



STATE OF TENNESSEE
CERTIFICATION REGARDING DEBARMENT, SUSPENSION
AND OTHER RESPONSIBILITY MATTERS

The prospective participant certifies to the best of its knowledge and belief that it and its principals:

- Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
- Have not within a three-year period preceding this proposal been convicted of or had a civil judgement rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
- Are not presently indicted for or otherwise criminally or civilly charged by a government entity (Federal, State, or local) with commission of any of the offenses enumerated in paragraph (b) of this certification; and
- Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.

I understand that a false statement on this certification may be grounds for rejection of this proposal or termination of the award. In addition, under 18 USC Sec. 1001, a false statement may result in a fine of up to \$10,000 or imprisonment for up to 5 years, or both.

Signature of Authorized Representative	Date
Printed Name	Phone Number / Email Address

I am unable to certify to the above statements. Explanation is attached.



STATE OF TENNESSEE
IRAN DIVESTMENT ACT CERTIFICATION

SUBJECT CONTRACT NUMBER(S):	
CONTRACTOR LEGAL ENTITY NAME:	
EDISON SUPPLIER IDENTIFICATION NUMBER:	

The Iran Divestment Act, Tenn. Code Ann. § 12-12-101 et. seq. requires a person that attempts to contract with the state, including a contract renewal or assumption, to certify at the time the bid is submitted or the contract is entered into, renewed, or assigned, that the person or the assignee is not identified on a list created pursuant to § 12-12-106.

Currently, the list is available online at the following website: <https://www.tn.gov/generalservices/procurement/central-procurement-office--cpo-/library-/public-information-library.html>

The Contractor, identified above, certifies by signature below that it is not included on the list of persons created pursuant to Tenn. Code Ann. § 12-12-106 of the Iran Divestment Act.

CONTRACTOR SIGNATURE

NOTICE: This certification MUST be signed by an individual with legal capacity to contractually bind the Contractor.

PRINTED NAME AND TITLE OF SIGNATORY

DATE



STATE OF TENNESSEE
NON-BOYCOTT OF ISRAEL CERTIFICATION

The Bidder certifies that it is not currently engaged in, and will not for the duration of the contract engage in, a boycott of Israel as defined by Tenn. Code Ann. § 12-4-119. This provision shall not apply to contracts with a total value of less than two hundred fifty thousand dollars (\$250,000) or to contractors with less than ten (10) employees.

According to the law, a boycott of Israel means engaging in refusals to deal, terminating business activities, or other commercial actions that are intended to limit commercial relations with Israel, or companies doing business in or with Israel or authorized by, licensed by, or organized under the laws of the State of Israel to do business, or persons or entities doing business in Israel, when such actions are taken:

- 1) In compliance with, or adherence to, calls for a boycott of Israel, or
- 2) In a manner that discriminates on the basis of nationality, national origin, religion, or other unreasonable basis, and is not based on a valid business reason. Tenn. Code Ann. § 12-4-119.

Signature of Authorized Representative	Date
Printed Name	Phone Number / Email Address



STATE OF TENNESSEE
CERTIFICATION OF BIDDER REGARDING
USE OF WOMEN/MINORITY SUBCONTRACTORS
****Construction Projects Only****

This certification is required for the contractor to demonstrate that when subcontractors are to be used on this project, an attempt will be made to utilize women/minority owned firms.

Documentation must be on file to show who has been contacted.

- I certify that every attempt was made to utilize female/minority contractors on this project.
- I am unable to certify to the above statements. Explanation is attached.

Signature of Authorized Representative	Date
Printed Name	Phone Number
Email Address	Address

NOTICE OF AWARD

Date of Issuance: _____

Owner: Town of Stanton Owner's Project No.: _____

Engineer: A2H, Inc. Engineer's Project No.: 22209.02

Project: Water Treatment Plant Equipment Upgrades

Bidder: _____

Bidder's Address: _____

You are notified that Owner has accepted your Bid dated **July 10, 2024** for the above Contract, and that you are the Successful Bidder and are awarded a Contract for:

Water Treatment Plant Equipment Upgrades

The Contract Price of the awarded Contract is \$_____.

Four [4] unexecuted counterparts of the Agreement accompany this Notice of Award, and one copy of the Contract Documents accompanies this Notice of Award, or has been transmitted or made available to Bidder electronically.

Drawings will be delivered separately from the other Contract Documents.

You must comply with the following conditions precedent within 15 days of the date of receipt of this Notice of Award:

1. Deliver to Owner **four [4]** counterparts of the Agreement, signed by Bidder (as Contractor).
2. Deliver with the signed Agreement(s) the Contract security (such as required performance and payment bonds) and insurance documentation, as specified in the Instructions to Bidders and in the General Conditions, Articles 2 and 6.

Failure to comply with these conditions within the time specified will entitle Owner to consider you in default, annul this Notice of Award, and declare your Bid security forfeited.

Within 10 days after you comply with the above conditions, Owner will return to you one fully signed counterpart of the Agreement, together with any additional copies of the Contract Documents as indicated in Paragraph 2.02 of the General Conditions.

Owner: Town of Stanton

By (signature): _____

Name (printed): The Honorable Allan Sterbinsky, Ph.D.

Title: Mayor

Copy: Engineer

AGREEMENT BETWEEN OWNER AND CONTRACTOR FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)

This Agreement is by and between **Town of Stanton** ("Owner") and _____
("Contractor").

Terms used in this Agreement have the meanings stated in the General Conditions and the Supplementary Conditions.

Owner and Contractor hereby agree as follows:

ARTICLE 1—WORK

1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work includes the rehabilitation of one raw water well, installation of new raw water piping from the existing wells, 750 GPM induced draft aerator, clearwell, two high service pumps rated at 750 GPM, new raw water meter, new finished water meter to existing elevated storage tank, new electrical panels, starters, and wiring, and new SCADA system.

ARTICLE 2—THE PROJECT

2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows:
Water Treatment Plant Equipment Upgrades, TDEC ARPA DW-PDC-2.

ARTICLE 3—ENGINEER

3.01 The Owner has retained **A2H, Inc.** ("Engineer") to act as Owner's representative, assume all duties and responsibilities of Engineer, and have the rights and authority assigned to Engineer in the Contract.

3.02 The part of the Project that pertains to the Work has been designed by the **Engineer**.

ARTICLE 4—CONTRACT TIMES

4.01 *Time is of the Essence*

A. All time limits completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

4.02 *Deleted.*

4.03 *Contract Times: Days*

A. The Work will be completed and ready for final payment within **365** days after the date when the Contract Times commence to run as provided in the Notice to Proceed.

4.04 *Liquidated Damages*

A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial and other losses if the Work is not completed within the Contract Times, as duly modified. The parties also recognize the delays, expense, and difficulties involved in proving, in a legal or arbitration proceeding, the actual loss suffered by Owner if the Work is not

completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty):

1. *Completion of Work:* If Contractor shall neglect, refuse, or fail to complete the Work within the Contract Times (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay Owner **\$1,000.00** for each day that expires after such time until the Work is completed and ready for final payment.
 2. Liquidated damages for failing to timely attain completion are not additive, and will not be imposed concurrently.
- B. If Owner recovers liquidated damages for a delay in completion by Contractor, then such liquidated damages are Owner's sole and exclusive remedy for such delay, and Owner is precluded from recovering any other damages, whether actual, direct, excess, or consequential, for such delay, except for special damages (if any) specified in this Agreement.
- 4.05 *Special Damages – Deleted.*

ARTICLE 5—CONTRACT PRICE

- 5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents, subject to adjustment under the Contract:
- A. For all Work, at the prices stated in Contractor's Bid, attached hereto.

ARTICLE 6—PAYMENT PROCEDURES

- 6.01 *Submittal and Processing of Payments*
- A. Contractor shall submit Applications for Payment in accordance with Article 15 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.
- 6.02 *Progress Payments; Retainage*
- A. Owner shall make progress payments on the basis of Contractor's Applications for Payment on or about the **25th** day of each month during performance of the Work as provided in Paragraph 6.02.A.1 below, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided elsewhere in the Contract.
1. Prior to Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Owner may withhold, including but not limited to liquidated damages, in accordance with the Contract.
 - a. **95** percent of the value of the Work completed (with the balance being retainage).
 - 1) If 50 percent or more of the Work has been completed, as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer,

then as long as the character and progress of the Work remain satisfactory to Owner and Engineer, there will be no additional retainage; and

b. **95** percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).

B. Upon Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to **100** percent of the Work completed, less such amounts set off by Owner pursuant to Paragraph 15.01.E of the General Conditions, and less **200** percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the punch list of items to be completed or corrected prior to final payment.

6.03 *Final Payment*

A. Upon final completion and acceptance of the Work, Owner shall pay the remainder of the Contract Price in accordance with Paragraph 15.06 of the General Conditions.

6.04 *Consent of Surety*

A. Owner will not make final payment, or return or release retainage unless Contractor submits written consent of the surety to such payment, return, or release.

6.05 *Interest*

A. All amounts not paid when due will bear interest at the rate of **3** percent per annum.

ARTICLE 7—CONTRACT DOCUMENTS

7.01 *Contents*

A. The Contract Documents consist of all of the following:

1. This Agreement.
2. Bonds:
 - a. Performance bond (together with power of attorney).
 - b. Payment bond (together with power of attorney).
3. General Conditions.
4. Supplementary Conditions.
5. Specifications as listed in the table of contents of the project manual.
6. Drawings listed on the attached sheet index.
7. Addenda (numbers ___ to ___, inclusive).
8. Exhibits to this Agreement (enumerated as follows):
 - a. Contractor's Bid Form.
9. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:
 - a. Notice to Proceed.
 - b. Work Change Directives.

- c. Change Orders.
 - d. Field Orders.
 - e. Warranty Bond, if any.
- B. The Contract Documents listed in Paragraph 7.01.A are attached to this Agreement (except as expressly noted otherwise above).
- C. There are no Contract Documents other than those listed above in this Article 7.
- D. The Contract Documents may only be amended, modified, or supplemented as provided in the Contract.

ARTICLE 8—REPRESENTATIONS, CERTIFICATIONS, AND STIPULATIONS

8.01 Contractor's Representations

- A. In order to induce Owner to enter into this Contract, Contractor makes the following representations:
- 1. Contractor has examined and carefully studied the Contract Documents, including Addenda.
 - 2. Contractor has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
 - 3. Contractor is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work.
 - 4. Contractor has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, with respect to the Technical Data in such reports and drawings.
 - 5. Contractor has carefully studied the reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, with respect to Technical Data in such reports and drawings.
 - 6. Contractor has considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and (c) Contractor's safety precautions and programs.
 - 7. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.
 - 8. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.

9. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
10. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
11. Contractor's entry into this Contract constitutes an incontrovertible representation by Contractor that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

8.02 *Contractor's Certifications*

- A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 8.02:
 1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Contract execution;
 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
 3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and
 4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

8.03 *Standard General Conditions*

- A. Owner stipulates that if the General Conditions that are made a part of this Contract are EJCDC® C-700, Standard General Conditions for the Construction Contract (2018), published by the Engineers Joint Contract Documents Committee, and if Owner is the party that has furnished said General Conditions, then Owner has plainly shown all modifications to the standard wording of such published document to the Contractor, through a process such as highlighting or "track changes" (redline/strikeout), or in the Supplementary Conditions.

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement.

This Agreement will be effective on _____ (which is the Effective Date of the Contract).

Owner:

Contractor:

Town of Stanton

(typed or printed name of organization)

(typed or printed name of organization)

By:

(individual's signature)

By:

(individual's signature)

Date:

(date signed)

Date:

(date signed)

Name:

The Honorable Allan Sterbinsky,

(typed or printed)

Name:

(typed or printed)

Title:

Mayor

(typed or printed)

Title:

(typed or printed)

(If [Type of Entity] is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest:

(individual's signature)

Attest:

(individual's signature)

Title:

(typed or printed)

Title:

(typed or printed)

Address for giving notices:

Address for giving notices:

Stanton Municipal Building

8 Main Street

Stanton, TN 38069

Designated Representative:

Designated Representative:

Name:

(typed or printed)

Name:

(typed or printed)

Title:

(typed or printed)

Title:

(typed or printed)

Address:

Address:

Phone:

Phone:

Email:

Email:

(If [Type of Entity] is a corporation, attach evidence of authority to sign. If [Type of Entity] is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)

License No.:

(where applicable)

State:

Tennessee

PERFORMANCE BOND

Contractor Name: Address <i>(principal place of business)</i> :	Surety Name: Address <i>(principal place of business)</i> :
Owner Name: Mailing address <i>(principal place of business)</i> :	Contract Description <i>(name and location)</i> : Contract Price: Effective Date of Contract:
Bond Bond Amount: Date of Bond: <i>(Date of Bond cannot be earlier than Effective Date of Contract)</i> Modifications to this Bond form: <input type="checkbox"/> None <input type="checkbox"/> See Paragraph 16	
Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth in this Performance Bond, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.	
Contractor as Principal	Surety
<i>(Full formal name of Contractor)</i>	<i>(Full formal name of Surety) (corporate seal)</i>
By: _____ <i>(Signature)</i>	By: _____ <i>(Signature)(Attach Power of Attorney)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
Attest: _____ <i>(Signature)</i>	Attest: _____ <i>(Signature)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
<i>Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party is considered plural where applicable.</i>	

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.
2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Paragraph 3.
3. If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond will arise after:
 - 3.1. The Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice may indicate whether the Owner is requesting a conference among the Owner, Contractor, and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Paragraph 3.1 will be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor, and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement does not waive the Owner's right, if any, subsequently to declare a Contractor Default;
 - 3.2. The Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and
 - 3.3. The Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.
4. Failure on the part of the Owner to comply with the notice requirement in Paragraph 3.1 does not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.
5. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:
 - 5.1. Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;
 - 5.2. Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;
 - 5.3. Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owners concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or
 - 5.4. Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:

- 5.4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or
 - 5.4.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.
- 6. If the Surety does not proceed as provided in Paragraph 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Paragraph 5.4, and the Owner refuses the payment, or the Surety has denied liability, in whole or in part, without further notice, the Owner shall be entitled to enforce any remedy available to the Owner.
- 7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of the Surety to the Owner will not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety will not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication for:
 - 7.1. the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;
 - 7.2. additional legal, design professional, and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 5; and
 - 7.3. liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.
- 8. If the Surety elects to act under Paragraph 5.1, 5.3, or 5.4, the Surety's liability is limited to the amount of this Bond.
- 9. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price will not be reduced or set off on account of any such unrelated obligations. No right of action will accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors, and assigns.
- 10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.
- 11. Any proceeding, legal or equitable, under this Bond must be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and must be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit will be applicable.
- 12. Notice to the Surety, the Owner, or the Contractor must be mailed or delivered to the address shown on the page on which their signature appears.
- 13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with

said statutory or legal requirement will be deemed deleted therefrom and provisions conforming to such statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will be construed as a statutory bond and not as a common law bond.

14. Definitions

14.1. *Balance of the Contract Price*—The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made including allowance for the Contractor for any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

14.2. *Construction Contract*—The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

14.3. *Contractor Default*—Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

14.4. *Owner Default*—Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

14.5. *Contract Documents*—All the documents that comprise the agreement between the Owner and Contractor.

15. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond will be deemed to be Subcontractor and the term Owner will be deemed to be Contractor.

16. Modifications to this Bond are as follows: **None.**

PAYMENT BOND

Contractor Name: Address <i>(principal place of business)</i> :	Surety Name: Address <i>(principal place of business)</i> :
Owner Name: Mailing address <i>(principal place of business)</i> :	Contract Description <i>(name and location)</i> : Contract Price: Effective Date of Contract:
Bond Bond Amount: Date of Bond: <i>(Date of Bond cannot be earlier than Effective Date of Contract)</i> Modifications to this Bond form: <input type="checkbox"/> None <input type="checkbox"/> See Paragraph 18	
Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth in this Payment Bond, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.	
Contractor as Principal	Surety
<i>(Full formal name of Contractor)</i>	<i>(Full formal name of Surety) (corporate seal)</i>
By: _____ <i>(Signature)</i>	By: _____ <i>(Signature)(Attach Power of Attorney)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
Attest: _____ <i>(Signature)</i>	Attest: _____ <i>(Signature)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
<i>Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party is considered plural where applicable.</i>	

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials, and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.
2. If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.
3. If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond will arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.
4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.
5. The Surety's obligations to a Claimant under this Bond will arise after the following:
 - 5.1. Claimants who do not have a direct contract with the Contractor
 - 5.1.1. have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and
 - 5.1.2. have sent a Claim to the Surety (at the address described in Paragraph 13).
 - 5.2. Claimants who are employed by or have a direct contract with the Contractor have sent a Claim to the Surety (at the address described in Paragraph 13).
6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.
7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:
 - 7.1. Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and
 - 7.2. Pay or arrange for payment of any undisputed amounts.
 - 7.3. The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 will not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

8. The Surety's total obligation will not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond will be credited for any payments made in good faith by the Surety.
9. Amounts owed by the Owner to the Contractor under the Construction Contract will be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfying obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.
10. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.
11. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.
12. No suit or action will be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit will be applicable.
13. Notice and Claims to the Surety, the Owner, or the Contractor must be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, will be sufficient compliance as of the date received.
14. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement will be deemed deleted here from and provisions conforming to such statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will be construed as a statutory bond and not as a common law bond.
15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.
16. Definitions
 - 16.1. *Claim*—A written statement by the Claimant including at a minimum:
 - 16.1.1. The name of the Claimant;
 - 16.1.2. The name of the person for whom the labor was done, or materials or equipment furnished;
 - 16.1.3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;
 - 16.1.4. A brief description of the labor, materials, or equipment furnished;

- 16.1.5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
 - 16.1.6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;
 - 16.1.7. The total amount of previous payments received by the Claimant; and
 - 16.1.8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.
- 16.2. *Claimant*—An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic’s lien or similar statute against the real property upon which the Project is located. The intent of this Bond is to include without limitation in the terms of “labor, materials, or equipment” that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor’s subcontractors, and all other items for which a mechanic’s lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.
- 16.3. *Construction Contract*—The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.
- 16.4. *Owner Default*—Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.
- 16.5. *Contract Documents*—All the documents that comprise the agreement between the Owner and Contractor.
17. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond will be deemed to be Subcontractor and the term Owner will be deemed to be Contractor.
18. Modifications to this Bond are as follows: **None.**

NOTICE TO PROCEED

Owner: Town of Stanton Owner's Project No.: _____
Engineer: A2H, Inc. Engineer's Project No.: 22209.02
Contractor: _____ Contractor's Project No.: _____
Contract Name: Water Treatment Plant Equipment Upgrades
Effective Date of Contract: _____

In accordance with the Agreement dated _____:

Contractor is hereby notified to commence the work on or before _____, and is to complete the work within **365** consecutive calendar days thereafter. The date of Completion of all work is, therefore, _____.

Owner: Town of Stanton
By *(signature)*: _____
Name *(printed)*: The Honorable Allan Sterbinsky, Ph.D.
Title: Mayor
Date Issued: _____
Copy: Engineer

Required and Recommended State and Local Fiscal Recovery Funds (SLRF) Supplemental Conditions for Contracts

Below is a listing of required and recommended supplemental conditions for contracts, along with sample language. This is not an exhaustive list. It is recommended Grantees use this list to supplement typical contract provisions and notify potential bidders of these conditions in the advertisement for bids.

Required Clauses

Legal/contractual/administrative remedies for breach of contract

Contracts for more than the simplified acquisition threshold, currently set at \$250,000, must address administrative, contractual, or legal remedies in instances where contractors violate or breach contract terms, and provide for such sanctions and penalties as appropriate.

Termination for cause or convenience

All contracts in excess of \$10,000 must address termination for cause and for convenience by the non-Federal entity, including the manner by which it will be affected and the basis for settlement.

Equal Employment Opportunity

Any contract that uses federal funds to pay for construction work is a “federally assisted construction contract” and must include the equal opportunity clause found in 2 C.F.R. Part 200, unless otherwise stated in 41 C.F.R. Part 60. This contract provision is required for all procurements that meet the definition of a “federally assisted construction contract.”

Required Language. The regulation at 41 C.F.R. Part 60-1.4(b) requires the insertion of the following contract clause.

During the performance of this contract, the contractor agrees as follows:

- (1) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, 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, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following: Employment, upgrading, 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 setting forth the provisions of this nondiscrimination clause.

- (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, sexual orientation, gender identity, or national origin.

- (2) The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.
- (3) The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- (4) The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
- (5) The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- (6) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law. (8) The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through
- (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance:

Provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

The applicant further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally assisted construction work: Provided, That if the applicant so participating is a State or local government, the above equal opportunity clause is not applicable

to any agency, instrumentality or subdivision of such government which does not participate in work on or under the contract.

The applicant agrees that it will assist and cooperate actively with the administering agency and the Secretary of Labor in obtaining the compliance of contractors and subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish the administering agency and the Secretary of Labor such information as they may require for the supervision of such compliance, and that it will otherwise assist the administering agency in the discharge of the agency's primary responsibility for securing compliance.

The applicant further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a contractor debarred from, or who has not demonstrated eligibility for, Government contracts and federally assisted construction contracts pursuant to the Executive Order and will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon contractors and subcontractors by the administering agency or the Secretary of Labor pursuant to Part II, Subpart D of the Executive Order. In addition, the applicant agrees that if it fails or refuses to comply with these undertakings, the administering agency may take any or all of the following actions: Cancel, terminate, or suspend in whole or in part this grant (contract, loan, insurance, guarantee); refrain from extending any further assistance to the applicant under the program with respect to which the failure or refund occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.

[Davis-Bacon Act](#)

U.S. Treasury exercised its federal authority outlining the requirements for water infrastructure projects executed using ARP funds. Therefore, the requirements for prevailing wages and rates slightly differs from the standards of Davis-Bacon. Individual projects less than \$10 million dollars are not required to provide certification that prevailing wages and rates were followed. Individual projects of \$10 million dollars or more require certification similar to Davis-Bacon and are outlined below. Please note that any project using other funding sources, like Community Development Block Grants or SRF loans, are subject to requirements for those programs. When combining funding sources on a single and complete project or phase, other funding program requirements may trump the requirements for the use of ARP funds. We recommend Grantees and Project Owners discuss project requirements with TDEC when leveraging ARP funds with other funding programs to ensure all applicable rules and regulations are followed.

Individual Water Infrastructure Projects of \$10 million dollars or more

- (1) A recipient may provide a certification that, for the relevant project, all laborers and mechanics employed by contractors and subcontractors in the performance of such project are paid wages at rates not less than those prevailing, as determined by the U.S. Secretary of Labor in accordance with subchapter IV of chapter 31 of title 40, United States Code (commonly known as the "Davis-Bacon Act"), for the corresponding classes of laborers and mechanics employed on projects of a character similar to the contract work in the civil subdivision of the State (or the District of Columbia) in which the work is to be performed, or by the appropriate State entity pursuant to a corollary State prevailing-wage-in-construction law (commonly known as "baby Davis-Bacon Acts"). If such certification is not provided, a recipient must provide a project employment and local impact report detailing:
 - a. The number of employees of contractors and sub-contractors working on the project;
 - b. The number of employees on the project hired directly and hired through a third party;
 - c. The wages and benefits of workers on the project by classification; and
 - d. Whether those wages are at rates less than those prevailing. 19 Recipients must maintain sufficient records to substantiate this information upon request.

- (2) A recipient may provide a certification that a project includes a project labor agreement, meaning a pre-hire collective bargaining agreement consistent with section 8(f) of the National Labor Relations Act (29 U.S.C. 158(f)). If the recipient does not provide such certification, the recipient must provide a project workforce continuity plan, detailing:
- a. How the recipient will ensure the project has ready access to a sufficient supply of appropriately skilled and unskilled labor to ensure high-quality construction throughout the life of the project, including a description of any required professional certifications and/or in-house training;
 - b. How the recipient will minimize risks of labor disputes and disruptions that would jeopardize timeliness and cost-effectiveness of the project;
 - c. How the recipient will provide a safe and healthy workplace that avoids delays and costs associated with workplace illnesses, injuries, and fatalities, including descriptions of safety training, certification, and/or licensure requirements for all relevant workers (e.g., OSHA 10, OSHA 30);
 - d. Whether workers on the project will receive wages and benefits that will secure an appropriately skilled workforce in the context of the local or regional labor market; and
 - e. Whether the project has completed a project labor agreement.
- (3) Whether the project prioritizes local hires.
- (4) Whether the project has a Community Benefit Agreement, with a description of any such agreement.

Suggested Language, if applicable. The following provides a sample contract clause:

- a. All transactions regarding this contract shall be done in compliance with the Davis-Bacon Act (40 U.S.C. 3141- 3144, and 3146-3148) and the requirements of 29C.F.R. pt. 5 as may be applicable. The contractor shall comply with 40 U.S.C. 3141-3144, and 3146-3148 and the requirements of 29 C.F.R. pt. 5 as applicable.
- b. b. Contractors are required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor.
- c. c. Additionally, contractors are required to pay wages not less than once a week.

Copeland Anti-Kickback Act

The Copeland "Anti-Kickback" Act prohibits workers on construction contracts from giving up wages that they are owed. This requirement applies to all contracts for construction or repair work above \$2,000 in situations where the Davis-Bacon Act also applies.

Suggested Language, if applicable. The following provides a sample contract clause:

- a. a. Contractor. The contractor shall comply with 18 U.S.C. § 874, 40 U.S.C. § 3145, and the requirements of 29 C.F.R. pt. 3 as may be applicable, which are incorporated by reference into this contract.
- b. b. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clause above and a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all of these contract clauses.
- c. c. Breach. A breach of the contract clauses above may be grounds for termination of the contract, and for debarment as a contractor and subcontractor as provided in 29 C.F.R. § 5.12."

Contract Work Hours and Safety Standards Act

Where applicable, all contracts awarded by the non-Federal entity in excess of \$100,000 that involve the employment of mechanics or laborers must include a provision for compliance with 40 U.S.C. §§ 3702 and 3704, as supplemented by Department of Labor regulations at 29 C.F.R. Part 5. See 2 C.F.R. Part 200, Appendix II(E). Each contractor must be required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours.

Required Language. The following provides a sample contract clause:

Compliance with the Contract Work Hours and Safety Standards Act.

- (1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.
- (2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (b)(1) of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (b)(1) of this section, in the t \$27 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (b)(1) of this section.
- (3) Withholding for unpaid wages and liquidated damages. The (write in the name of the Federal agency or the loan or grant recipient) shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.
- (4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (b)(1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (b)(1) through (4) of this section.

Clean Air Act and Federal Water Pollution Control Act

For contracts over \$150,000, contracts must contain a provision requiring contractors to comply with the Clean Air Act and the Federal Water Pollution Control Act. If applicable, contracts must contain a provision that requires the contractor to agree to comply with all applicable standards, orders, or regulations issued pursuant

to the Clean Air Act (42 U.S.C. §§ 7401-7671q.) and the Federal Water Pollution Control Act as amended (33 U.S.C. §§ 1251-1387).

Suggested Language. The following provides a sample contract clause.

Clean Air Act

- (1) The contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. § 7401 et seq
- (2) The contractor agrees to report each violation to the (name of subrecipient entering into the contract) and understands and agrees that the (name of the subrecipient entering into the contract) will, in turn, report each violation as required to assure notification to Treasury, and the appropriate Environmental Protection Agency Regional Office.
- (3) The contractor agrees to include these requirements in each subcontract exceeding \$150,000

Federal Water Pollution Control Act

- (1) The contractor agrees to comply with all applicable standards, orders, or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 ets eq.
- (2) The contractor agrees to report each violation to the (name of the subrecipient entering into the contract) and understands and agrees that the (name of the subrecipient entering into the contract) will, in turn, report each violation as required to assure notification to the Treasury, and the appropriate Environmental Protection Agency Regional Office.
- (3) The contractor agrees to include these requirements in each subcontract exceeding \$150,000

Debarment and Suspension

Non-federal entities, contractors and subcontractors are subject to debarment and suspension regulations. These regulations restrict awards, subawards, and contracts with certain parties that are debarred, suspended, or otherwise excluded from or ineligible for participation in Federal assistance programs and activities. In general, an “excluded” party cannot receive a Federal grant award or a contract within the meaning of a “covered transaction,” to include subawards and subcontracts. The debarment and suspension clause is required for all contracts and subcontracts for \$25,000 or more, all contracts that require the consent of an official of a federal agency, and all contracts for federally required audit services.

Suggested Language. The following provides a debarment and suspension clause. It incorporates an optional method of verifying that contractors are not excluded or disqualified.

Suspension and Debarment

- (1) This contract is a covered transaction for purposes of 2 C.F.R. pt. 180 and 2 C.F.R. pt. 3000. As such, the contractor is required to verify that none of the contractor’s principals (defined at 2 C.F.R. § 180.995) or its affiliates (defined at 2 C.F.R. § 180.905) are excluded (defined at 2 C.F.R. § 180.940) or disqualified (defined at 2 C.F.R. § 180.935).
- (2) The contractor must comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, and must include a requirement to comply with these regulations in any lower tier covered transaction it enters into.

- (3) This certification is a material representation of fact relied upon by (insert name of recipient/subrecipient/applicant). If it is later determined that the contractor did not comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, in addition to remedies available to (insert name of recipient/subrecipient/applicant), the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment.
- (4) The bidder or proposer agrees to comply with the requirements of 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C while this offer is valid and throughout the period of any contract that may arise from this offer. The bidder or proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.

Byrd Anti-Lobbying Amendment

Contractors that apply or bid for a contract of \$100,000 or more under a federal grant must file the required certification. This is also applicable to subcontractors of more than \$100,000, must include a contract provision prohibiting the use of federal appropriated funds to influence officers or employees of the federal government. Contractors that apply or bid for a contract for more than \$100,000 must also file the required certification regarding lobbying.

Suggested Language. The following provides a sample contract clause:

Byrd Anti-Lobbying Amendment, 31 U.S.C. § 1352

Contractors who apply or bid for an award of \$100,000 or more shall file the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, officer or employee of Congress, or an employee of a Member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 U.S.C. § 1352. Each tier shall also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the recipient who in turn will forward the certification(s) to the awarding agency.

Procurement of Recovered Materials

A non-Federal entity that is a state agency or agency of a political subdivision of a state and its contractors must comply with section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. The requirements of Section 6002 include procuring only items designated in guidelines of the Environmental Protection Agency (EPA) at 40 CFR part 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition, where the purchase price of the item exceeds \$10,000 or the value of the quantity acquired during the preceding fiscal year exceeded \$10,000; procuring solid waste management services in a manner that maximizes energy and resource recovery; and establishing an affirmative procurement program for procurement of recovered materials identified in the EPA guidelines.

Suggested Language. The following provides a sample contract clause:

“In the performance of this contract, the Contractor shall make maximum use of products containing recovered materials that are EPA-designated items unless the product cannot be acquired competitively within a timeframe providing for compliance with the contract performance schedule; meeting contract performance requirements; or at a reasonable price.

Information about this requirement, along with the list of EPA-designated items, is available at [EPA's Comprehensive Procurement Guidelines webpage](#).

The Contractor also agrees to comply with all other applicable requirements of Section 6002 of the Solid Waste Disposal Act.”

Domestic Preference for Procurement

As appropriate, and to the extent consistent with law, NFEs should, to the greatest extent practicable under a federal award, provide a preference for the purchase, acquisition, or use of goods, products or materials produced in the United States. This includes, but is not limited to, iron, aluminum, steel, cement, and other manufactured products.

Suggested Language. The following provides a sample contract clause:

“Domestic Preference for Procurements

As appropriate, and to the extent consistent with law, the contractor should, to the greatest extent practicable, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States. This includes, but is not limited to iron, aluminum, steel, cement, and other manufactured products.

For purposes of this clause:

Produced in the United States means, for iron and steel products, that all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States. Manufactured products mean items and construction materials composed in whole or in part of non-ferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber.”

Recommended Clauses

Access to Records

NFEs and their contractors and subcontractors must give the Department of Treasury and other authorized representatives access to records associated with their awards during the federally required record retention period and as long as the records are retained.

Suggested Language. The following provides a sample contract clause:

The following access to records requirements apply to this contract:

(1) The Contractor agrees to provide (insert name of state agency or local or Indian tribal government), (insert name of recipient), Treasury, the Comptroller General of the United States, or any of their authorized representatives access to any books, documents, papers, and records of the Contractor which are directly pertinent to this contract for the purposes of making audits, examinations, excerpts, and transcriptions.

(2) The Contractor agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.

(3) The Contractor agrees to provide the Treasury or authorized representatives access to construction or other work sites pertaining to the work being completed under the contract.

Contract Changes or Modifications

To be eligible for ARP SLFRF assistance under the non-Federal entity's Treasury grant or cooperative agreement, the cost of the change, modification, change order, or constructive change must be allowable, allocable, within the scope of its grant or cooperative agreement, and reasonable for the completion of project scope.

Compliance with Federal Law, Regulations and Executive Orders

The recipient and its contractors are required to comply with all Federal laws, regulations, and executive orders.

Suggested Language. The following provides a sample contract clause:

“This is an acknowledgement that Treasury ARP SLFRF financial assistance will be used to fund all or a portion of the contract. The contractor will comply with all applicable Federal law, regulations, executive orders, Treasury policies, procedures, and directives.”

Program Fraud and False or Fraudulent Statements or Related Acts

Recipients must comply with the requirements of The False Claims Act (31 U.S.C. §§ 3729-3733) which prohibits the submission of false or fraudulent claims for payment to the federal government. It is that the non-Federal entity include a provision in its contract that the contractor acknowledges that 31 U.S.C. Chap. 38 (Administrative Remedies for False Claims and Statements) applies to its actions pertaining to the contract.

Suggested Language. The following provides a sample contract clause:

“The Contractor acknowledges that 31 U.S.C. Chap. 38 (Administrative Remedies for False Claims and Statements) applies to the Contractor's actions pertaining to this contract.”

Access to Records

NFEs and their contractors and subcontractors must give the Department of Treasury and other authorized representatives access to records associated with their awards during the federally required record retention period and as long as the records are retained.

The following access to records requirements apply to this contract:

(1) The Contractor agrees to provide (insert name of state agency or local or Indian tribal government), (insert name of recipient), Treasury, the Comptroller General of the United States, or any of their authorized representatives access to any books, documents, papers, and records of the Contractor which are directly pertinent to this contract for the purposes of making audits, examinations, excerpts, and transcriptions.

(2) The Contractor agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.

(3) The Contractor agrees to provide the Treasury or authorized representatives access to construction or other work sites pertaining to the work being completed under the contract.

Contract Changes or Modifications

To be eligible for ARP SLFRF assistance under the non-Federal entity's Treasury grant or cooperative agreement, the cost of the change, modification, change order, or constructive change must be allowable, allocable, within the scope of its grant or cooperative agreement, and reasonable for the completion of project scope.

Compliance with Federal Law, Regulations and Executive Orders

The recipient and its contractors are required to comply with all Federal laws, regulations, and executive orders.

"This is an acknowledgement that Treasury ARP SLFRF financial assistance will be used to fund all or a portion of the contract. The contractor will comply with all applicable Federal law, regulations, executive orders, Treasury policies, procedures, and directives."

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"The Contractor acknowledges that 31 U.S.C. Chap. 38 (Administrative Remedies for False Claims and Statements) applies to the Contractor's actions pertaining to this contract."

These Supplemental Conditions are recommended by the Tennessee Department of Environment and Conservation for projects funded through under the American Rescue Plan (ARP) State and Local Fiscal Recovery Fund (SLFRF). If the information is reproduced or conflicts with other sections of this Bid Manual or the Contract, the more stringent requirement applies.

Appendix II to Part 200

Contract Provisions for Non-Federal Entity Contracts Under Federal Awards

In addition to other provisions required by the Federal agency or non-Federal entity, all contracts made by the non-Federal entity under the Federal award must contain provisions covering the following, as applicable.

- (A) Contracts for more than the simplified acquisition threshold, which is the inflation adjusted amount determined by the Civilian Agency Acquisition Council and the Defense Acquisition Regulations Council (Councils) as authorized by 41 U.S.C. 1908, must address administrative, contractual, or legal remedies in instances where contractors violate or breach contract terms, and provide for such sanctions and penalties as appropriate.
- (B) All contracts in excess of \$10,000 must address termination for cause and for convenience by the non-Federal entity including the manner by which it will be effected and the basis for settlement.
- (C) Equal Employment Opportunity. Except as otherwise provided under 41 CFR Part 60, all contracts that meet the definition of “federally assisted construction contract” in 41 CFR Part 60-1.3 must include the equal opportunity clause provided under 41 CFR 60-1.4(b), in accordance with Executive Order 11246, “Equal Employment Opportunity” (30 FR 12319, 12935, 3 CFR Part, 1964-1965 Comp., p. 339), as amended by Executive Order 11375, “Amending Executive Order 11246 Relating to Equal Employment Opportunity,” and implementing regulations at 41 CFR part 60, “Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor.”
- (D) Davis-Bacon Act, as amended (40 U.S.C. 3141-3148). When required by Federal program legislation, all prime construction contracts in excess of \$2,000 awarded by non-Federal entities must include a provision for compliance with the Davis-Bacon Act (40 U.S.C. 3141-3144, and 3146-3148) as supplemented by Department of Labor regulations (29 CFR Part 5, “Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction”). In accordance with the statute, contractors must be required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor. In addition, contractors must be required to pay wages not less than once a week. The non-Federal entity must place a copy of the current prevailing wage determination issued by the Department of Labor in each solicitation. The decision to award a contract or subcontract must be conditioned upon the acceptance of the wage determination. The non-Federal entity must report all suspected or reported violations to the Federal awarding agency. The contracts must also include a provision for compliance with the Copeland “Anti-Kickback” Act (40 U.S.C. 3145), as supplemented by Department of Labor regulations (29 CFR Part 3, “Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United States”). The Act provides that each contractor or subrecipient must be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he or she is otherwise entitled. The non-Federal entity must report all suspected or reported violations to the Federal awarding agency.
- (E) Contract Work Hours and Safety Standards Act (40 U.S.C. 3701-3708). Where applicable, all contracts awarded by the non-Federal entity in excess of \$100,000 that involve the employment of mechanics or laborers must include a provision for compliance with 40 U.S.C. 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR Part 5). Under 40 U.S.C. 3702 of the Act, each contractor must be required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is

compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. The requirements of 40 U.S.C. 3704 are applicable to construction work and provide that no laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous. These requirements do not apply to the purchases of supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence.

- (F) Rights to Inventions Made Under a Contract or Agreement. If the Federal award meets the definition of “funding agreement” under 37 CFR § 401.2 (a) and the recipient or subrecipient wishes to enter into a contract with a small business firm or nonprofit organization regarding the substitution of parties, assignment or performance of experimental, developmental, or research work under that “funding agreement,” the recipient or subrecipient must comply with the requirements of 37 CFR Part 401, “Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements,” and any implementing regulations issued by the awarding agency.
- (G) Clean Air Act (42 U.S.C. 7401-7671q.) and the Federal Water Pollution Control Act (33 U.S.C. 1251-1387), as amended - Contracts and subgrants of amounts in excess of \$150,000 must contain a provision that requires the non-Federal award to agree to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251-1387). Violations must be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA).
- (H) Debarment and Suspension (Executive Orders 12549 and 12689) - A contract award (see 2 CFR 180.220) must not be made to parties listed on the governmentwide exclusions in the System for Award Management (SAM), in accordance with the OMB guidelines at 2 CFR 180 that implement Executive Orders 12549 (3 CFR part 1986 Comp., p. 189) and 12689 (3 CFR part 1989 Comp., p. 235), “Debarment and Suspension.” SAM Exclusions contains the names of parties debarred, suspended, or otherwise excluded by agencies, as well as parties declared ineligible under statutory or regulatory authority other than Executive Order 12549.
- (I) Byrd Anti-Lobbying Amendment (31 U.S.C. 1352) - Contractors that apply or bid for an award exceeding \$100,000 must file the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any other award covered by 31 U.S.C. 1352. Each tier must also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the non-Federal award.

(J) See § 200.323.

(K) See § 200.216.

(L) See § 200.322.

[78 FR 78608, Dec. 26, 2013, as amended at 79 FR 75888, Dec. 19, 2014; 85 FR 49577, Aug. 13, 2020]

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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 document prepared by Contractor, in a form acceptable to Engineer, to request 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; 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; 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.
- 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.
 - c. A demand or assertion by Owner or Contractor, duly submitted in compliance with the procedural requirements set forth herein, made pursuant to Paragraph 12.01.A.4, concerning disputes arising after Engineer has issued a recommendation of final payment.
 - d. 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), lead-based paint (as defined by the HUD/EPA standard), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to Laws and Regulations 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 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. *Electronic Document*—Any Project-related correspondence, attachments to correspondence, data, documents, drawings, information, or graphics, including but not limited to Shop Drawings and other Submittals, that are in an electronic or digital format.
21. *Electronic Means*—Electronic mail (email), upload/download from a secure Project website, or other communications methods that allow: (a) the transmission or communication of Electronic Documents; (b) the documentation of transmissions, including sending and receipt; (c) printing of the transmitted Electronic Document by the

recipient; (d) the storage and archiving of the Electronic Document by sender and recipient; and (e) the use by recipient of the Electronic Document for purposes permitted by this Contract. Electronic Means does not include the use of text messaging, or of Facebook, Twitter, Instagram, or similar social media services for transmission of Electronic Documents.

22. *Engineer*—The individual or entity named as such in the Agreement.
23. *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.
24. *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.
 - a. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated into the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, is not a Hazardous Environmental Condition.
 - b. The presence of Constituents of Concern that are to be removed or remediated as part of the Work is not a Hazardous Environmental Condition.
 - c. The presence of Constituents of Concern as part of the routine, anticipated, and obvious working conditions at the Site, is not a Hazardous Environmental Condition.
25. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and binding decrees, resolutions, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
26. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.
27. *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.
28. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.
29. *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.
30. *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.
31. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising Contractor's plan to accomplish the Work within the Contract Times.
32. *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.

33. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative (RPR) includes any assistants or field staff of Resident Project Representative.
34. *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.
35. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer’s review of the submittals.
36. *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.
37. *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.
38. *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 or areas furnished by Owner which are designated for the use of Contractor.
39. *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.
40. *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.
41. *Submittal*—A written or graphic document, prepared by or for Contractor, which the Contract Documents require Contractor to submit to Engineer, or that is indicated as a Submittal in the Schedule of Submittals accepted by Engineer. Submittals may include Shop Drawings and Samples; schedules; product data; Owner-delegated designs; sustainable design information; information on special procedures; testing plans; results of tests and evaluations, source quality-control testing and inspections, and field or Site quality-control testing and inspections; warranties and certifications; Suppliers’ instructions and reports; records of delivery of spare parts and tools; operations and maintenance data; Project photographic documentation; record documents; and other such documents required by the Contract Documents. Submittals, whether or not approved or accepted by Engineer, are not Contract Documents. Change Proposals, Change Orders, Claims, notices, Applications for Payment, and requests for interpretation or clarification are not Submittals.
42. *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 of such Work.

43. *Successful Bidder*—The Bidder to which the Owner makes an award of contract.
44. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.
45. *Supplier*—A manufacturer, fabricator, supplier, distributor, 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.
46. *Technical Data*
- a. Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (1) existing subsurface conditions at or adjacent to the Site, or existing physical conditions at or adjacent to the Site including existing surface or subsurface structures (except Underground Facilities) or (2) Hazardous Environmental Conditions at the Site.
 - b. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then Technical Data is defined, with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06, as the data contained in boring logs, recorded measurements of subsurface water levels, assessments of the condition of subsurface facilities, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical, environmental, or other Site or facilities conditions report prepared for the Project and made available to Contractor.
 - c. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data, and instead Underground Facilities are shown or indicated on the Drawings.
47. *Underground Facilities*—All active or not-in-service underground lines, pipelines, conduits, ducts, encasements, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or systems at the Site, including but not limited to those facilities or systems that produce, transmit, distribute, or convey telephone or other communications, cable television, fiber optic transmissions, power, electricity, light, heat, gases, oil, crude oil products, liquid petroleum products, water, steam, waste, wastewater, storm water, other liquids or chemicals, or traffic or other control systems. An abandoned facility or system is not an Underground Facility.
48. *Unit Price Work*—Work to be paid for on the basis of unit prices.
49. *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.
50. *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 Paragraphs 1.02.B, C, D, and E are not defined terms that require initial capital letters, but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. *Intent of Certain Terms or Adjectives:* 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:* The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.
- D. *Defective:* The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
1. does not conform to the Contract Documents;
 2. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 3. 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 Paragraph 15.04).
- E. *Furnish, Install, Perform, Provide*
1. The word “furnish,” when used in connection with services, materials, or equipment, means 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, means 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, means 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. *Contract Price or Contract Times*: References to a change in “Contract Price or Contract Times” or “Contract Times or Contract Price” or similar, indicate that such change applies to (1) Contract Price, (2) Contract Times, or (3) both Contract Price and Contract Times, as warranted, even if the term “or both” is not expressed.
- G. 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 Performance and Payment Bonds; Evidence of Insurance*

- A. *Performance and Payment Bonds*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner the performance bond and payment bond (if the Contract requires Contractor to furnish such bonds).
- B. *Evidence of Contractor’s Insurance*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each additional insured (as identified in the Contract), the certificates, endorsements, and other evidence of insurance required to be provided by Contractor in accordance with Article 6, except to the extent the Supplementary Conditions expressly establish other dates for delivery of specific insurance policies.
- C. *Evidence of Owner’s Insurance*: After receipt of the signed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each additional insured (as identified in the Contract), 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 signed 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 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 *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 the schedules submitted in accordance with Paragraph 2.03.A. No progress payment will 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.
 - 4. If a schedule is not acceptable, Contractor will have an additional 10 days to revise and resubmit the schedule.

2.06 *Electronic Transmittals*

- A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may send, and shall accept, Electronic Documents transmitted by Electronic Means.
- B. If the Contract does not establish protocols for Electronic Means, then Owner, Engineer, and Contractor shall jointly develop such protocols.
- C. Subject to any governing protocols for Electronic Means, when transmitting Electronic Documents by Electronic Means, the transmitting party makes no representations as to long-term compatibility, usability, or readability of the Electronic Documents 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 Electronic Documents.

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

- A. The Contract Documents are complementary; what is required by one Contract Document 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 versions of the Contract Documents (including any printed copies derived from such electronic versions) and the printed record version, the printed record version will 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.
- F. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation will be deemed stricken, and all remaining provisions will continue to be valid and binding upon Owner and Contractor, which agree that the Contract Documents will be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.
- G. Nothing in the Contract Documents creates:
 - 1. any contractual relationship between Owner or Engineer and any Subcontractor, Supplier, or other individual or entity performing or furnishing any of the Work, for the benefit of such Subcontractor, Supplier, or other individual or entity; or
 - 2. 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.

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, means 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, and no instruction of a Supplier, will be effective to change the duties or responsibilities of Owner, Contractor, or Engineer 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 or Engineer 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 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 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 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 in writing 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.

- 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 notify Owner and Contractor in writing 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 versions, 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 precludes 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 30th 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 60th day after the day of Bid opening or the 30th 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 may 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 must 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 will 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 Contract Price or 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. Such an adjustment will 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 third-party utility owners or other third-party entities (other than those third-party utility owners or other third-party entities performing other work at or adjacent to the Site as arranged by or under contract with Owner, as contemplated in Article 8); and
 - 4. Acts of war or terrorism.

- D. Contractor's entitlement to an adjustment of Contract Times or Contract Price is limited as follows:
1. Contractor's entitlement to an adjustment of the Contract Times is conditioned on the delay, disruption, or interference adversely affecting an activity on the critical path to completion of the Work, as of the time of the delay, disruption, or interference.
 2. Contractor shall not be entitled to an adjustment in Contract Price 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. Such a concurrent delay by Contractor shall not preclude an adjustment of Contract Times to which Contractor is otherwise entitled.
 3. Adjustments of Contract Times or Contract Price are subject to the provisions of Article 11.
- E. Each Contractor request or Change Proposal seeking an increase in Contract Times or Contract Price must be supplemented by supporting data that sets forth in detail the following:
1. The circumstances that form the basis for the requested adjustment;
 2. The date upon which each cause of delay, disruption, or interference began to affect the progress of the Work;
 3. The date upon which each cause of delay, disruption, or interference ceased to affect the progress of the Work;
 4. The number of days' increase in Contract Times claimed as a consequence of each such cause of delay, disruption, or interference; and
 5. The impact on Contract Price, in accordance with the provisions of Paragraph 11.07.
- Contractor shall also furnish such additional supporting documentation as Owner or Engineer may require including, where appropriate, a revised progress schedule indicating all the activities affected by the delay, disruption, or interference, and an explanation of the effect of the delay, disruption, or interference on the critical path to completion of the Work.
- F. 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, together with the provisions of Paragraphs 4.05.D and 4.05.E.
- G. Paragraph 8.03 addresses 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.

ARTICLE 5—SITE; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor in writing 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, or to improvements, structures, utilities, or similar facilities located at such adjacent lands 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 7.13, 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 in a court of competent jurisdiction; 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 will 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 of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data;
2. Those drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data; and
3. Technical Data contained in such reports and drawings.

- B. *Underground Facilities:* Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05, and not in the drawings referred to in Paragraph 5.03.A. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.

- C. *Reliance by Contractor on Technical Data:* 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 Paragraph 1.01.A.46.b.

- D. *Limitations of Other Data and Documents:* 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;
2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings;
3. the contents of other Site-related documents made available to Contractor, such as record drawings from other projects at or adjacent to the Site, or Owner's archival documents concerning the Site; or
4. 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:
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;
 2. is of such a nature as to require a change in the Drawings or Specifications;
 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 whether it is necessary for Owner to obtain 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; 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. *Early Resumption of Work:* If at any time Engineer determines that Work in connection with the subsurface or physical condition in question may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the condition in question has been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.
- E. *Possible Price and Times Adjustments*
1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, 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 subject to the provisions of Paragraphs 4.05.D and 4.05.E.
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;
 - 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 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, then any such adjustment will 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, 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.
- F. *Underground Facilities; Hazardous Environmental Conditions*: Paragraph 5.05 governs rights and responsibilities regarding the presence or location of Underground Facilities. Paragraph 5.06 governs rights and responsibilities regarding Hazardous Environmental Conditions. The provisions of Paragraphs 5.03 and 5.04 are not applicable to the presence or location of Underground Facilities, or to Hazardous Environmental Conditions.

5.05 *Underground Facilities*

- A. *Contractor's Responsibilities*: Unless it is otherwise expressly provided in the Supplementary Conditions, the cost of all of the following are included in the Contract Price, and Contractor shall have full responsibility for:
1. reviewing and checking all information and data regarding existing Underground Facilities at the Site;
 2. complying with applicable state and local utility damage prevention Laws and Regulations;

3. verifying the actual location of those Underground Facilities shown or indicated in the Contract Documents as being within the area affected by the Work, by exposing such Underground Facilities during the course of construction;
 4. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
 5. 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 on the Drawings, or was not shown or indicated on the Drawings 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), notify Owner and Engineer in writing regarding such Underground Facility.
- C. *Engineer's Review:* Engineer will:
1. promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated on the Drawings, or was not shown or indicated with reasonable accuracy;
 2. identify and communicate with the owner of the Underground Facility; prepare recommendations to Owner (and if necessary issue any preliminary instructions to Contractor) regarding the Contractor's resumption of Work in connection with the Underground Facility in question;
 3. obtain any pertinent cost or schedule information from Contractor; 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
 4. 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. *Early Resumption of Work:* If at any time Engineer determines that Work in connection with the Underground Facility may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the Underground Facility in question and conditions affected by its presence have been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.
- F. *Possible Price and Times Adjustments*
1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, to the extent that any existing Underground Facility at the Site that was not shown

or indicated on the Drawings, 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. 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;
 - b. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E; and
 - c. 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, then any such adjustment will 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, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.
 4. The information and data shown or indicated on the Drawings with respect to existing Underground Facilities at the Site is based on information and data (a) furnished by the owners of such Underground Facilities, or by others, (b) obtained from available records, or (c) gathered in an investigation conducted in accordance with the current edition of ASCE 38, Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data, by the American Society of Civil Engineers. If such information or data is incorrect or incomplete, Contractor's remedies are limited to those set forth in this Paragraph 5.05.F.

5.06 *Hazardous Environmental Conditions at Site*

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

1. those reports known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site;
2. drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; 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 on the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b. 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;
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, as a result of such Work stoppage, such special conditions under which Work is agreed to be resumed by Contractor, or any costs or expenses incurred in response to the Hazardous Environmental Condition, 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. Entitlement to any such adjustment is subject to the provisions of Paragraphs 4.05.D, 4.05.E, 11.07, and 11.08.
- 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, 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.I obligates 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 obligates 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 Contractor's obligations under the Contract. These bonds must 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 terms of a prescribed bond form, the Supplementary Conditions, or other provisions of the Contract.
- B. Contractor shall also furnish such other bonds (if any) as are required by the Supplementary Conditions or other provisions of the Contract.
- C. All bonds must be in the form included in the Bidding Documents or otherwise specified by Owner prior to execution of the Contract, except as provided otherwise by Laws or

Regulations, and must be issued and signed by a surety named in “Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies” as published in Department Circular 570 (as amended and supplemented) by the Bureau of the Fiscal Service, 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 must show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.

- D. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue bonds in the required amounts.
- E. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer in writing and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which must comply with the bond and surety requirements above.
- F. 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.
- G. Upon request to Owner from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Owner shall provide a copy of the payment bond to such person or entity.
- H. Upon request to Contractor from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Contractor shall provide a copy of the payment bond to such person or entity.

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. Alternative forms of insurance coverage, including but not limited to self-insurance and “Occupational Accident and Excess Employer’s Indemnity Policies,” are not sufficient to meet the insurance requirements of this Contract, unless expressly allowed in the Supplementary Conditions.
- D. Contractor shall deliver to Owner, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Contractor has obtained and is maintaining the policies and coverages 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, documentation of applicable self-insured retentions (if allowed) and deductibles, full disclosure of all relevant exclusions, and evidence of insurance required to be purchased and maintained by

Subcontractors or Suppliers. In any documentation furnished under this provision, Contractor, Subcontractors, and Suppliers may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those applicable to this Contract.

- E. Owner shall deliver to Contractor, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Owner has obtained and is maintaining the policies and coverages 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, documentation of applicable self-insured retentions (if allowed) and deductibles, and full disclosure of all relevant exclusions. In any documentation furnished under this provision, Owner may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those relevant to this Contract.
- F. 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, will not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.
- G. In addition to the liability insurance required to be provided by Contractor, the Owner, at Owner's option, may purchase and maintain Owner's own liability insurance. 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.
- H. Contractor shall require:
 - 1. Subcontractors to purchase and maintain worker's compensation, commercial general liability, and other insurance that is appropriate for their participation in the Project, and to name as additional insureds Owner and Engineer (and any other individuals or entities identified in the Supplementary Conditions as additional insureds on Contractor's liability policies) on each Subcontractor's commercial general liability insurance policy; and
 - 2. Suppliers to purchase and maintain insurance that is appropriate for their participation in the Project.
- I. If either party does not purchase or maintain 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.
- J. If Contractor has failed to obtain and maintain required insurance, Contractor's entitlement to enter or remain at the Site will end immediately, and Owner may impose an appropriate set-off against payment for any associated costs (including but not limited to the cost of purchasing necessary insurance coverage), and exercise Owner's termination rights under Article 16.
- K. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect (but is in no way obligated) 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 will be adjusted accordingly.

- L. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests. Contractor is responsible for determining whether such coverage and limits are adequate to protect its interests, and for obtaining and maintaining any additional insurance that Contractor deems necessary.
- M. The insurance and insurance limits required herein will not be deemed as a limitation on Contractor's liability, or that of its Subcontractors or Suppliers, under the indemnities granted to Owner and other individuals and entities in the Contract or otherwise.
- N. All the policies of insurance required to be purchased and maintained under this Contract will contain a provision or endorsement that the coverage afforded will not be canceled, 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 and Engineer.

6.03 Contractor's Insurance

- A. *Required Insurance:* Contractor shall purchase and maintain Worker's Compensation, Commercial General Liability, and other insurance pursuant to the specific requirements of the Supplementary Conditions.
- B. *General Provisions:* The policies of insurance required by this Paragraph 6.03 as supplemented must:
 - 1. include at least the specific coverages required;
 - 2. be written for not less than the limits provided, or those required by Laws or Regulations, whichever is greater;
 - 3. remain in effect at least until the Work is complete (as set forth in Paragraph 15.06.D), and longer if expressly required elsewhere in this Contract, 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;
 - 4. apply with respect to the performance of the Work, whether such performance is 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; and
 - 5. include all necessary endorsements to support the stated requirements.
- C. *Additional Insureds:* The Contractor's commercial general liability, automobile liability, employer's liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies, if required by this Contract, must:
 - 1. include and list as additional insureds Owner and Engineer, and any individuals or entities identified as additional insureds in the Supplementary Conditions;
 - 2. include coverage for the respective officers, directors, members, partners, employees, and consultants of all such additional insureds;
 - 3. afford primary coverage to these additional insureds for all claims covered thereby (including as applicable those arising from both ongoing and completed operations);

4. not seek contribution from insurance maintained by the additional insured; and
5. as to commercial general liability insurance, apply to additional insureds with respect to liability caused in whole or in part by Contractor's acts or omissions, or the acts and omissions of those working on Contractor's behalf, in the performance of Contractor's operations.

6.04 *Builder's Risk and Other 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 Work's full insurable replacement cost (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). The specific requirements applicable to the builder's risk insurance are set forth in the Supplementary Conditions.
- B. *Property Insurance for Facilities of Owner Where Work Will Occur*: Owner is responsible for obtaining and maintaining property insurance covering each existing structure, building, or facility in which any part of the Work will occur, or to which any part of the Work will attach or be adjoined. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, providing coverage consistent with that required for the builder's risk insurance, and will be maintained until the Work is complete, as set forth in Paragraph 15.06.D.
- C. *Property Insurance for Substantially Complete Facilities*: Promptly after Substantial Completion, and before actual occupancy or use of the substantially completed Work, Owner will obtain property insurance for such substantially completed Work, and maintain such property insurance at least until the Work is complete, as set forth in Paragraph 15.06.D. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, and provide coverage consistent with that required for the builder's risk insurance. The builder's risk insurance may terminate upon written confirmation of Owner's procurement of such property insurance.
- 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 advance notice of such occupancy or use to the builder's risk insurer, and obtain an endorsement consenting to the continuation of coverage prior to commencing such partial occupancy or use.
- E. *Insurance of Other Property; Additional Insurance*: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, then the entity or individual owning such property item will be responsible for insuring it. 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 6.04, it may do so at Contractor's expense.

6.05 *Property Losses; Subrogation*

- A. The builder's risk insurance policy purchased and maintained in accordance with Paragraph 6.04 (or an installation floater policy if authorized by the Supplementary Conditions), will contain provisions to the effect that in the event of payment of any loss or damage the insurer 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.

1. 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, risks, 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 individuals or entities identified in the Supplementary Conditions as builder's risk or installation floater 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.
 2. None of the above waivers extends 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. Any property insurance policy maintained by Owner covering any loss, damage, or consequential loss to Owner's existing structures, buildings, or facilities in which any part of the Work will occur, or to which any part of the Work will attach or adjoin; to adjacent structures, buildings, or facilities of Owner; or to part or all of the completed or substantially completed Work, 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, will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them, and that the insured is allowed to waive the insurer's rights of subrogation in a written contract executed prior to the loss, damage, or consequential loss.
1. 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 all losses and damages caused by, arising out of, or resulting from fire or any of the perils, risks, or causes of loss covered by such policies.
- C. The waivers in this Paragraph 6.05 include the waiver of rights 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 insured peril, risk, or cause of loss.
- D. Contractor shall be responsible for assuring that each Subcontract 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 fire or other peril, risk, or cause of loss covered by builder's risk insurance, installation floater, and any other property insurance applicable to the Work.

6.06 *Receipt and Application of Property Insurance Proceeds*

- A. Any insured loss under the builder's risk and other policies of property insurance required by Paragraph 6.04 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 6.04 shall maintain such proceeds in a segregated account, and 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, Contractor shall repair or replace the damaged Work, using allocated insurance proceeds.

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

7.01 *Contractor's Means and Methods of Construction*

- A. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.
- B. If the Contract Documents note, or Contractor determines, that professional engineering or other design services are needed to carry out Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures, or for Site safety, then Contractor shall cause such services to be provided by a properly licensed design professional, at Contractor's expense. Such services are not Owner-delegated professional design services under this Contract, and neither Owner nor Engineer has any responsibility with respect to (1) Contractor's determination of the need for such services, (2) the qualifications or licensing of the design professionals retained or employed by Contractor, (3) the performance of such services, or (4) any errors, omissions, or defects in such services.

7.02 *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.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who will not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

7.03 *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 maintain good discipline and order at the Site.

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

7.04 *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 must be new and of good quality, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications will 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 must 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.

7.05 *"Or Equals"*

- A. *Contractor's Request; Governing Criteria:* Whenever an item of equipment or material is specified or described in the Contract Documents by using the names of one or more proprietary items or specific Suppliers, 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 equipment or material, or items from other proposed Suppliers, under the circumstances described below.
 - 1. If Engineer in its sole discretion determines that an item of equipment or material proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer will deem it an "or equal" item. For the purposes of this paragraph, a proposed item of equipment or material will be considered functionally equal to an item so named if:
 - a. in the exercise of reasonable judgment Engineer determines that the proposed item:
 - 1) is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

- 2) 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) has a proven record of performance and availability of responsive service; and
 - 4) is not objectionable to Owner.
- b. Contractor certifies that, if the proposed item is approved and incorporated into the Work:
- 1) there will be no increase in cost to the Owner or increase in Contract Times; and
 - 2) the item 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 will result in any change in Contract Price. The Engineer's denial of an "or-equal" request will be final and binding, and may not be reversed through an appeal under any provision of the Contract.
- E. *Treatment as a Substitution Request*: If Engineer determines that an item of equipment or material proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer consider the item a proposed substitute pursuant to Paragraph 7.06.

7.06 Substitutes

- A. *Contractor's Request; Governing Criteria*: Unless the specification or description of an item of equipment or material 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 equipment or material under the circumstances described below. To the extent possible such requests must 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 equipment or material from anyone other than Contractor.
 2. The requirements for review by Engineer will be as set forth in Paragraph 7.06.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 equipment or material that Contractor seeks to furnish or use. The application:
 - a. will 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 the item specified; and
 - 3) be suited to the same use as the item 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 the item specified; and
 - 2) available engineering, sales, maintenance, repair, and replacement services.
 - d. will 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 will be final and binding, and may not be reversed through an appeal under any provision of the Contract. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.06.D, by timely submittal of a Change Proposal.

7.07 *Concerning Subcontractors and Suppliers*

- A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner. The Contractor's retention of a Subcontractor or Supplier for the performance of parts of the Work will not relieve Contractor's obligation to Owner to perform and complete the Work in accordance with the Contract Documents.
- B. Contractor shall retain specific Subcontractors and Suppliers 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 or Supplier 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 5 days.
- E. Owner may require the replacement of any Subcontractor or Supplier. 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 or Suppliers 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 or Supplier so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor or Supplier.
- F. If Owner requires the replacement of any Subcontractor or Supplier retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, 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 or Supplier, whether initially or as a replacement, will 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 solely responsible for scheduling and coordinating the work of Subcontractors and Suppliers.
- J. The divisions and sections of the Specifications and the identifications of any Drawings do not control Contractor in dividing the Work among Subcontractors or Suppliers, or in delineating the Work to be performed by any specific trade.
- K. All Work performed for Contractor by a Subcontractor or Supplier must be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract for the benefit of Owner and Engineer.
- L. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor for Work performed for Contractor by the Subcontractor or Supplier.
- M. Contractor shall restrict all Subcontractors and Suppliers from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed in this Contract.

7.08 *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 an 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 will be disclosed 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.

7.09 *Permits*

- A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits, licenses, and certificates of occupancy. 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.

7.10 *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.

7.11 *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. 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 is not Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this does not relieve Contractor of its obligations under Paragraph 3.03.
- C. Owner or Contractor may give written 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 written notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.12 *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.

7.13 *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.
- B. Contractor shall designate a qualified and experienced safety representative whose duties and responsibilities are the prevention of Work-related accidents and the maintenance and supervision of safety precautions and programs.
- C. 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.
- D. All damage, injury, or loss to any property referred to in Paragraph 7.13.C.2 or 7.13.C.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).
- E. 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.
- F. Contractor shall notify Owner; the owners of adjacent property; the owners of Underground Facilities and other utilities (if the identity of such owners is known to Contractor); and other contractors and utility owners performing work at or adjacent to the Site, in writing, when Contractor knows that 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.
- G. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. Any Owner's safety programs that are applicable to the Work are identified or included in the Supplementary Conditions or Specifications.
- H. 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.

- I. Contractor's duties and responsibilities for safety and protection will continue until all the Work is completed, Engineer has issued a written notice to Owner and Contractor in accordance with Paragraph 15.06.C that the Work is acceptable, and Contractor has left the Site (except as otherwise expressly provided in connection with Substantial Completion).
- J. Contractor's duties and responsibilities for safety and protection will 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.

7.14 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of safety data sheets (formerly known as 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 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 by an emergency, or are required as a result of Contractor's response to an emergency. If Engineer determines that a change in the Contract Documents is required because of an emergency or Contractor's response, a Work Change Directive or Change Order will be issued.

7.16 *Submittals*

A. *Shop Drawing and Sample Requirements*

- 1. Before submitting a Shop Drawing or Sample, Contractor shall:
 - a. review and coordinate the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
 - b. determine and verify:
 - 1) all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect to the Submittal;
 - 2) 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
 - 3) all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto;
 - c. confirm that the Submittal is complete with respect to all related data included in the Submittal.
- 2. Each Shop Drawing or Sample must 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 Shop Drawing or Sample, Contractor shall give Engineer specific written notice of any variations that the Submittal may have from the requirements of the Contract Documents. This notice must be set forth in a written communication separate from the Submittal; and, in addition, in the case of a Shop Drawing by a specific notation made on the Shop Drawing itself.
- B. *Submittal Procedures for Shop Drawings and Samples:* Contractor shall label and submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals.
1. *Shop Drawings*
 - a. Contractor shall submit the number of copies required in the Specifications.
 - b. Data shown on the Shop Drawings must 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.C.
 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.C.
 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. *Engineer's Review of Shop Drawings and Samples*
1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the accepted Schedule of Submittals. 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, comply with the requirements of 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 will 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 or other appropriate Contract modification.

5. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for complying with the requirements of Paragraphs 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, will 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 or Sample will 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.C.4.

D. Resubmittal Procedures for Shop Drawings and Samples

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 Shop Drawing and Sample submittals with sufficient information and accuracy to obtain required approval of an item with no more than two resubmittals. Engineer will record Engineer's time for reviewing a third or subsequent resubmittal of a Shop Drawing or Sample, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges.
3. If Contractor requests a change of a previously approved Shop Drawing or Sample, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

E. Submittals Other than Shop Drawings, Samples, and Owner-Delegated Designs

1. The following provisions apply to all Submittals other than Shop Drawings, Samples, and Owner-delegated designs:
 - a. Contractor shall submit all such Submittals to the Engineer in accordance with the Schedule of Submittals and pursuant to the applicable terms of the Contract Documents.
 - b. Engineer will provide timely review of all such Submittals in accordance with the Schedule of Submittals and return such Submittals with a notation of either Accepted or Not Accepted. Any such Submittal that is not returned within the time established in the Schedule of Submittals will be deemed accepted.
 - c. Engineer's review will be only to determine if the Submittal is acceptable under the requirements of the Contract Documents as to general form and content of the Submittal.

- d. If any such Submittal is not accepted, Contractor shall confer with Engineer regarding the reason for the non-acceptance, and resubmit an acceptable document.
 2. Procedures for the submittal and acceptance of the Progress Schedule, the Schedule of Submittals, and the Schedule of Values are set forth in Paragraphs 2.03, 2.04, and 2.05.
- F. Owner-delegated Designs: Submittals pursuant to Owner-delegated designs are governed by the provisions of Paragraph 7.19.

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 is entitled to rely on Contractor's warranty and guarantee.
- B. Owner's rights under this warranty and guarantee are in addition to, and are not limited by, Owner's rights under the correction period provisions of Paragraph 15.08. The time in which Owner may enforce its warranty and guarantee rights under this Paragraph 7.17 is limited only by applicable Laws and Regulations restricting actions to enforce such rights; provided, however, that after the end of the correction period under Paragraph 15.08:
1. Owner shall give Contractor written notice of any defective Work within 60 days of the discovery that such Work is defective; and
 2. Such notice will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the notice.
- C. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
1. abuse, or improper modification, 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.
- D. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents is absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents, a release of Contractor's obligation to perform the Work in accordance with the Contract Documents, or a release of Owner's warranty and guarantee rights under this Paragraph 7.17:
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. The end of the correction period established in Paragraph 15.08;
 8. Any inspection, test, or approval by others; or

9. Any correction of defective Work by Owner.
- E. 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 will 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 losses, damages, costs, and judgments (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 from third-party claims or actions relating to or resulting from the performance or furnishing of the Work, provided that any such claim, action, loss, cost, judgment or damage is attributable to bodily injury, sickness, disease, or death, or to damage 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 will 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.

7.19 *Delegation of Professional Design Services*

- A. Owner may require Contractor to provide professional design services for a portion of the Work by express delegation in the Contract Documents. Such delegation will specify the performance and design criteria that such services must satisfy, and the Submittals that Contractor must furnish to Engineer with respect to the Owner-delegated design.
- B. Contractor shall cause such Owner-delegated professional design services to be provided pursuant to the professional standard of care by a properly licensed design professional, whose signature and seal must appear on all drawings, calculations, specifications, certifications, and Submittals prepared by such design professional. Such design professional must issue all certifications of design required by Laws and Regulations.
- C. If a Shop Drawing or other Submittal related to the Owner-delegated design is prepared by Contractor, a Subcontractor, or others for submittal to Engineer, then such Shop Drawing or other Submittal must bear the written approval of Contractor's design professional when submitted by Contractor to Engineer.

- D. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, and approvals performed or provided by the design professionals retained or employed by Contractor under an Owner-delegated design, subject to the professional standard of care and the performance and design criteria stated in the Contract Documents.
- E. Pursuant to this Paragraph 7.19, Engineer's review, approval, and other determinations regarding design drawings, calculations, specifications, certifications, and other Submittals furnished by Contractor pursuant to an Owner-delegated design will be only for the following limited purposes:
 - 1. Checking for conformance with the requirements of this Paragraph 7.19;
 - 2. Confirming that Contractor (through its design professionals) has used the performance and design criteria specified in the Contract Documents; and
 - 3. Establishing that the design furnished by Contractor is consistent with the design concept expressed in the Contract Documents.
- F. Contractor shall not be responsible for the adequacy of performance or design criteria specified by Owner or Engineer.
- G. Contractor is not required to provide professional services in violation of applicable Laws and Regulations.

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 third-party utility work that Owner has arranged to take place at or adjacent to the Site, Owner shall provide such information to Contractor.
- C. Contractor shall afford proper and safe access to the Site to each contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work.
- D. 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.

- E. If the proper execution or results of any part of Contractor's Work depends upon work performed by others, 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.
- F. The provisions of this article are not applicable to work that is performed by third-party utilities or other third-party entities without a contract with Owner, or that is performed without having been arranged by Owner. If such work occurs, then any related delay, disruption, or interference incurred by Contractor is governed by the provisions of Paragraph 4.05.C.3.

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 for Owner at or adjacent to the Site, the Owner's employees, any other contractor working for Owner, or any utility owner that Owner has arranged to perform work, 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. 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 will 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, and any remedies available to Contractor under Laws or Regulations concerning utility action or inaction. When applicable, any such equitable adjustment in Contract Price will 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 or Contract Price is subject to the provisions of Paragraphs 4.05.D and 4.05.E.

- 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.
 - 1. 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 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 8.03.B.
 - 2. 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 Contractor.
- C. 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 will 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 (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 10.07. 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 *Resident 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 the Supplementary Conditions and in Paragraph 10.07.
- B. If Owner designates an individual or entity who is not Engineer's consultant, agent, or employee to represent Owner at the Site, then the responsibilities and authority of such individual or entity will be as provided in the Supplementary Conditions.

10.04 *Engineer's Authority*

- A. Engineer has the authority to reject Work in accordance with Article 14.
- B. Engineer's authority as to Submittals is set forth in Paragraph 7.16.
- C. Engineer's authority as to design drawings, calculations, specifications, certifications and other Submittals from Contractor in response to Owner's delegation (if any) to Contractor of professional design services, is set forth in Paragraph 7.19.
- D. Engineer's authority as to changes in the Work is set forth in Article 11.

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

10.05 *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.

10.06 *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.

10.07 *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, will 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 Contractor under 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 10.07 also apply to the Resident Project Representative, if any.

10.08 *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 of which Engineer has been informed.

ARTICLE 11—CHANGES TO THE CONTRACT

11.01 *Amending and Supplementing the Contract*

- A. The Contract may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.
- B. If an amendment or supplement to the Contract includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order.
- C. All changes to the Contract that 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, must be supported by Engineer's recommendation. Owner and Contractor may amend other terms and conditions of the Contract without the recommendation of the Engineer.

11.02 *Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders covering:
 - 1. Changes in 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 11.05, (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 that embody the substance of any final and binding results under: Paragraph 11.03.B, resolving the impact of a Work Change Directive; Paragraph 11.09, concerning Change Proposals; Article 12, Claims; Paragraph 13.02.D, final adjustments resulting from allowances; Paragraph 13.03.D, final adjustments relating to determination of quantities for Unit Price Work; and similar provisions.
- B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of Paragraph 11.02.A, it will be deemed to be of full force and effect, as if fully executed.

11.03 *Work Change Directives*

- A. 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 11.07 regarding change of Contract Price.

- B. If Owner has issued a Work Change Directive and:
 - 1. Contractor believes that an adjustment in Contract Times or Contract Price is necessary, then Contractor shall submit any Change Proposal seeking such an adjustment no later than 30 days after the completion of the Work set out in the Work Change Directive.
 - 2. Owner believes that an adjustment in Contract Times or Contract Price is necessary, then Owner shall submit any Claim seeking such an adjustment no later than 60 days after issuance of the Work Change Directive.

11.04 *Field Orders*

- A. 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.
- B. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.05 *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. Changes involving the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters will be supported by Engineer's recommendation.
- B. Such changes in the Work 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 must be performed under the applicable conditions of the Contract Documents.
- C. Nothing in this Paragraph 11.05 obligates 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.

11.06 *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.C.2.

11.07 *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 must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment of Contract Price must 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);
 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 11.07.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 11.07.C).
- C. *Contractor's Fee:* When applicable, the Contractor's fee for overhead and profit will 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 will be 15 percent;
 - b. For costs incurred under Paragraph 13.01.B.3, the Contractor's fee will be 5 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 11.07.C.2.a and 11.07.C.2.b is that the Contractor's fee will be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.B.1 and 13.01.B.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 5 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 will be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the Work;
 - d. No fee will 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 of the Work will be the amount of the actual net decrease in Cost of the Work and a deduction of an additional amount equal to 5 percent of such actual net decrease in Cost of the Work; and
 - f. When both additions and credits are involved in any one change or Change Proposal, the adjustment in Contractor's fee will be computed by determining the sum of the costs in each of the cost categories in Paragraph 13.01.B (specifically, payroll costs, Paragraph 13.01.B.1; incorporated materials and equipment costs, Paragraph 13.01.B.2; Subcontract costs, Paragraph 13.01.B.3; special consultants costs, Paragraph 13.01.B.4; and other costs, Paragraph 13.01.B.5) and applying to each such cost category sum the appropriate fee from Paragraphs 11.07.C.2.a through 11.07.C.2.e, inclusive.

11.08 *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 must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment in the Contract Times must comply with the provisions of Article 12.
- B. Delay, disruption, and interference in the Work, and any related changes in Contract Times, are addressed in and governed by Paragraph 4.05.

11.09 *Change Proposals*

A. *Purpose and Content:* Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; contest an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; challenge a set-off against payment due; or seek other relief under the Contract. The Change Proposal will specify any proposed change in Contract Times or Contract Price, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents. Each Change Proposal will address only one issue, or a set of closely related issues.

B. *Change Proposal Procedures*

1. *Submittal:* Contractor shall submit each Change Proposal to Engineer within 30 days after the start of the event giving rise thereto, or after such initial decision.
2. *Supporting Data:* 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.
 - a. Change Proposals based on or related to delay, interruption, or interference must comply with the provisions of Paragraphs 4.05.D and 4.05.E.
 - b. Change proposals related to a change of Contract Price must include full and detailed accounts of materials incorporated into the Work and labor and equipment used for the subject Work.

The supporting data must 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.

3. *Engineer's Initial Review:* Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal. If in its discretion Engineer concludes that additional supporting data is needed before conducting a full review and making a decision regarding the Change Proposal, then Engineer may request that Contractor submit such additional supporting data by a date specified by Engineer, prior to Engineer beginning its full review of the Change Proposal.
4. *Engineer's Full Review and Action on the Change Proposal:* Upon receipt of Contractor's supporting data (including any additional data requested by Engineer), Engineer will conduct a full review of each Change Proposal and, within 30 days after such receipt of the Contractor's supporting data, either approve the Change Proposal in whole, deny it in whole, or approve it in part and deny it in part. Such actions must 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.

5. *Binding Decision*: Engineer's decision is final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.
- C. *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 in writing that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice will be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.
- D. *Post-Completion*: Contractor shall not submit any Change Proposals after Engineer issues a written recommendation of final payment pursuant to Paragraph 15.06.B.

11.10 *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 are subject 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;
 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; and
 4. Subject to the waiver provisions of Paragraph 15.07, any dispute arising after Engineer has issued a written recommendation of final payment pursuant to Paragraph 15.06.B.
- 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 rests with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, 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 will 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 will 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 will 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 will 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 will 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 will 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 will be incorporated in a Change Order or other written document 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. When needed 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 will be in amounts no higher than those commonly incurred in the locality of the Project, will not include any of the costs itemized in Paragraph 13.01.C, and will 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 in advance of the subject Work. Such employees include, without limitation, superintendents, foremen, safety managers, safety representatives, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work will be apportioned on the basis of their time spent on the Work. Payroll costs include, but are not limited to, salaries and wages plus the cost of fringe benefits, which include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, 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, will 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 accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts will accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment will 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, which 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 will 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 or retained for services specifically related to the Work.
 5. Other costs consisting of 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, 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.

- 1) In establishing included costs for materials such as scaffolding, plating, or sheeting, consideration will be given to the actual or the estimated life of the material for use on other projects; or rental rates may be established on the basis of purchase or salvage value of such items, whichever is less. Contractor will not be eligible for compensation for such items in an amount that exceeds the purchase cost of such item.

c. *Construction Equipment Rental*

- 1) Rentals of all construction equipment and machinery, and the parts thereof, in accordance with rental agreements approved by Owner as to price (including any surcharge or special rates applicable to overtime use of the construction equipment or machinery), and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs will be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts must cease when the use thereof is no longer necessary for the Work.
- 2) Costs for equipment and machinery owned by Contractor or a Contractor-related entity will be paid at a rate shown for such equipment in the equipment rental rate book specified in the Supplementary Conditions. An hourly rate will be computed by dividing the monthly rates by 176. These computed rates will include all operating costs.
- 3) With respect to Work that is the result of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price ("changed Work"), included costs will be based on the time the equipment or machinery is in use on the changed Work and the costs of transportation, loading, unloading, assembly, dismantling, and removal when directly attributable to the changed Work. The cost of any such equipment or machinery, or parts thereof, must cease to accrue when the use thereof is no longer necessary for the changed 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 builder's risk or other property insurance established in accordance with Paragraph 6.04), 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 include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses will 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 does not include any of the following items:

- 1. Payroll costs and other compensation of Contractor's officers, executives, principals, general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, 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. The cost of purchasing, renting, or furnishing small tools and hand tools.
- 3. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
- 4. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
- 5. 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.
- 6. Expenses incurred in preparing and advancing Claims.
- 7. 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*

- 1. When the Work as a whole is performed on the basis of cost-plus-a-fee, then:
 - a. Contractor's fee for the Work set forth in the Contract Documents as of the Effective Date of the Contract will be determined as set forth in the Agreement.
 - b. for any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work, Contractor's fee will be determined as follows:
 - 1) When the fee for the Work as a whole is a percentage of the Cost of the Work, the fee will automatically adjust as the Cost of the Work changes.
 - 2) When the fee for the Work as a whole is a fixed fee, the fee for any additions or deletions will be determined in accordance with Paragraph 11.07.C.2.
- 2. When the Work as a whole is performed on the basis of a stipulated sum, or any other basis other than cost-plus-a-fee, then Contractor's fee for any Work covered by a Change

Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work will be determined in accordance with Paragraph 11.07.C.2.

- E. *Documentation and Audit:* Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor and pertinent Subcontractors will establish and maintain records of the costs in accordance with generally accepted accounting practices. Subject to prior written notice, Owner will be afforded reasonable access, during normal business hours, to all Contractor's accounts, records, books, correspondence, instructions, drawings, receipts, vouchers, memoranda, and similar data relating to the Cost of the Work and Contractor's fee. Contractor shall preserve all such documents for a period of three years after the final payment by Owner. Pertinent Subcontractors will afford such access to Owner, and preserve such documents, to the same extent required of Contractor.

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 for any of the foregoing will be valid.
- C. *Owner's Contingency Allowance:* Contractor agrees that an Owner's 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 for Work covered by allowances, and the Contract Price will 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, and the final adjustment of Contract Price will be set forth in a Change Order, subject to the provisions of the following paragraph.

E. *Adjustments in Unit Price*

1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:
 - a. the quantity of the item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and
 - b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.
2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.
3. Adjusted unit prices will apply to all units of that item.

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 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 with such procedures and programs 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 will 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 will 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 will 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 written 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 will 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 additional 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, 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 will 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 defective Work as required by Engineer, then Owner may, after 7 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 for 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.
 - 2. 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 must also be accompanied by: (a) a bill of sale, invoice, copies of subcontract or purchase order payments, or other documentation

establishing full payment by Contractor for the materials and equipment; (b) at Owner's request, documentation warranting that Owner has received the materials and equipment free and clear of all Liens; and (c) 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.

3. Beginning with the second Application for Payment, each Application must include an affidavit of Contractor stating that all previous progress payments received by Contractor have been applied to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
4. 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;
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto;
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work;
 - d. to make any examination to ascertain how or for what purposes Contractor has used the money paid by Owner; 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. Ten 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 based on Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages resulting from 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 has occurred that would constitute a default by Contractor and therefore justify a termination for cause;
 - j. Liquidated or other 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; or
 - l. Other items entitle 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 will 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 will be treated as an amount due as determined by Paragraph 15.01.D.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 7 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 will 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 7 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 15.03.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 6.04 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 7.12), and other documents, Contractor may make application for final payment.
2. The final Application for Payment must 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 duly pending Change Proposals and Claims; 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 Final Application and Recommendation of Payment:* 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 10 days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the final Application for Payment to Owner for payment. Such recommendation will 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. 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. *Notice of Acceptability:* In support of its recommendation of payment of the final Application for Payment, Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to stated limitations in the notice and to the provisions of Paragraph 15.07.
- D. *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 and issuance of notice of the acceptability of the Work.
- E. *Final Payment Becomes Due:* Upon receipt from Engineer of the final Application for Payment and accompanying documentation, Owner shall set off against the amount recommended by Engineer for final payment any further sum to which Owner is entitled, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions of this Contract with respect to progress payments. Owner shall pay the resulting balance due to Contractor within 30 days of Owner's receipt of the final Application for Payment from Engineer.

15.07 *Waiver of Claims*

- A. By making final payment, Owner waives its claim or right to liquidated damages or other damages for late completion by Contractor, except as set forth in an outstanding Claim,

appeal under the provisions of Article 17, set-off, or express reservation of rights by Owner. Owner reserves all other claims or rights after final payment.

- 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 as a Claim, 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 Supplementary Conditions or the terms of any applicable special guarantee required by the Contract Documents), Owner gives Contractor written notice that any Work has been found to be defective, or that Contractor's repair of any damages to the Site or adjacent areas has been found to be defective, then after receipt of such notice of defect 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 adjacent areas;
 - 2. correct such defective Work;
 - 3. remove the defective Work from the Project and replace it with Work that is not defective, if the defective Work has been rejected by Owner, 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 from the corrective measures.
- B. Owner shall give any such notice of defect within 60 days of the discovery that such Work or repairs is defective. If such notice is given within such 60 days but after the end of the correction period, the notice will be deemed a notice of defective Work under Paragraph 7.17.B.
- C. If, after receipt of a notice of defect within 60 days and within the correction period, 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 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). Contractor's failure to pay such costs, losses, and damages within 10 days of invoice from Owner will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the failure to pay.
- D. 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.
- E. 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.

- F. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph are not to 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 directly attributable to any such suspension. Any Change Proposal seeking such adjustments must 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) 10 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) written 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 7 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 will govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate for Convenience*

- A. Upon 7 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 for any loss of anticipated profits or revenue, post-termination overhead costs, 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 7 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, 7 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, pursuant to Article 12; and
 2. Disputes between Owner and Contractor concerning the Work, or obligations under the Contract Documents, that arise 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;
 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 requires the giving of written notice to Owner, Engineer, or Contractor, it will be deemed to have been validly given only if delivered:
1. in person, by a commercial courier service or otherwise, to the recipient's place of business;
 2. by registered or certified mail, postage prepaid, to the recipient's place of business; or
 3. by e-mail to the recipient, with the words "Formal Notice" or similar in the e-mail's subject line.

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 will not constitute a waiver of that provision, nor will 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 of the Contract or 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 *Assignment of Contract*

- A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party to this Contract of any rights under or interests in the Contract will be binding on the other party without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract.

18.09 *Successors and Assigns*

- A. Owner and Contractor each binds itself, its successors, assigns, and legal representatives to the other party hereto, its successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

18.10 *Headings*

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

SUPPLEMENTARY CONDITIONS OF THE CONSTRUCTION CONTRACT

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SUPPLEMENTARY CONDITIONS OF THE CONSTRUCTION CONTRACT

These Supplementary Conditions amend or supplement EJCDC® C-700, Standard General Conditions of the Construction Contract (2018). The General Conditions remain in full force and effect except as amended.

The terms used in these Supplementary Conditions have the meanings stated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

The address system used in these Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added—for example, "Paragraph SC-4.05."

ARTICLE 1—DEFINITIONS AND TERMINOLOGY

No suggested Supplementary Conditions in this Article.

ARTICLE 2—PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

SC-2.01 Delete Paragraphs 2.01.B. and C. in their entirety and insert the following in their place:

- B. *Evidence of Contractor's Insurance:* When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner copies of the policies (including all endorsements, and identification of applicable self-insured retentions and deductibles) of insurance required to be provided by Contractor in this Contract. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.
- C. *Evidence of Owner's Insurance:* After receipt from Contractor of the signed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor copies of the policies of insurance to be provided by Owner in this Contract (if any). Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

2.02 *Copies of Documents*

SC-2.02 Amend the first sentence of Paragraph 2.02.A. to read as follows:

Engineer shall furnish to Contractor **one** printed copy of the Contract Documents (including one fully signed counterpart of the Agreement), and **one copy** in electronic portable document format (PDF).

2.06 *Electronic Transmittals*

SC-2.06 Delete Paragraphs 2.06.B and 2.06.C in their entirety and insert the following in their place:

- B. *Electronic Documents Protocol:* The parties shall conform to the following provisions in Paragraphs 2.06.B and 2.06.C, together referred to as the Electronic Documents Protocol ("EDP" or "Protocol") for exchange of electronic transmittals.
 - 1. *Basic Requirements*

- a. To the fullest extent practical, the parties agree to and will transmit and accept Electronic Documents in an electronic or digital format using the procedures described in this Protocol. Use of the Electronic Documents and any information contained therein is subject to the requirements of this Protocol and other provisions of the Contract.
- b. The contents of the information in any Electronic Document will be the responsibility of the transmitting party.
- c. Electronic Documents as exchanged by this Protocol may be used in the same manner as the printed versions of the same documents that are exchanged using non-electronic format and methods, subject to the same governing requirements, limitations, and restrictions, set forth in the Contract Documents.
- d. Except as otherwise explicitly stated herein, the terms of this Protocol will be incorporated into any other agreement or subcontract between a party and any third party for any portion of the Work on the Project, or any Project-related services, where that third party is, either directly or indirectly, required to exchange Electronic Documents with a party or with Engineer. Nothing herein will modify the requirements of the Contract regarding communications between and among the parties and their subcontractors and consultants.
- e. When transmitting Electronic Documents, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the receiving party's use of software application packages, operating systems, or computer hardware differing from those established in this Protocol.
- f. Nothing herein negates any obligation 1) in the Contract to create, provide, or maintain an original printed record version of Drawings and Specifications, signed and sealed according to applicable Laws and Regulations; 2) to comply with any applicable Law or Regulation governing the signing and sealing of design documents or the signing and electronic transmission of any other documents; or 3) to comply with the notice requirements of Paragraph 18.01 of the General Conditions.

2. *System Infrastructure for Electronic Document Exchange*

- a. Each party will provide hardware, operating system(s) software, internet, e-mail, and large file transfer functions ("System Infrastructure") at its own cost and sufficient for complying with the EDP requirements. With the exception of minimum standards set forth in this EDP, and any explicit system requirements specified by attachment to this EDP, it is the obligation of each party to determine, for itself, its own System Infrastructure.
 - 1) The maximum size of an email attachment for exchange of Electronic Documents under this EDP is **20 MB**. Attachments larger than that may be exchanged using large file transfer functions or physical media.
 - 2) Each Party assumes full and complete responsibility for any and all of its own costs, delays, deficiencies, and errors associated with converting, translating, updating, verifying, licensing, or otherwise enabling its System Infrastructure, including operating systems and software, for use with respect to this EDP.

- b. Each party is responsible for its own system operations, security, back-up, archiving, audits, printing resources, and other Information Technology (“IT”) for maintaining operations of its System Infrastructure during the Project, including coordination with the party’s individual(s) or entity responsible for managing its System Infrastructure and capable of addressing routine communications and other IT issues affecting the exchange of Electronic Documents.
- c. Each party will operate and maintain industry-standard, industry-accepted, ISO-standard, commercial-grade security software and systems that are intended to protect the other party from: software viruses and other malicious software like worms, trojans, adware; data breaches; loss of confidentiality; and other threats in the transmission to or storage of information from the other parties, including transmission of Electronic Documents by physical media such as CD/DVD/flash drive/hard drive. To the extent that a party maintains and operates such security software and systems, it shall not be liable to the other party for any breach of system security.
- d. In the case of disputes, conflicts, or modifications to the EDP required to address issues affecting System Infrastructure, the parties shall cooperatively resolve the issues; but, failing resolution, the Owner is authorized to make and require reasonable and necessary changes to the EDP to effectuate its original intent. If the changes cause additional cost or time to Contractor, not reasonably anticipated under the original EDP, Contractor may seek an adjustment in price or time under the appropriate process in the Contract.
- e. Each party is responsible for its own back-up and archive of documents sent and received during the term of the contract under this EDP, unless this EDP establishes a Project document archive, either as part of a mandatory Project website or other communications protocol, upon which the parties may rely for document archiving during the specified term of operation of such Project document archive. Further, each party remains solely responsible for its own post-Project back-up and archive of Project documents after the term of the Contract, or after termination of the Project document archive, if one is established, for as long as required by the Contract and as each party deems necessary for its own purposes.
- f. If a receiving party receives an obviously corrupted, damaged, or unreadable Electronic Document, the receiving party will advise the sending party of the incomplete transmission.
- g. The parties will bring any non-conforming Electronic Documents into compliance with the EDP. The parties will attempt to complete a successful transmission of the Electronic Document or use an alternative delivery method to complete the communication.
- h. The Owner will operate a Project information management system (also referred to in this EDP as “Project Website”) for use of Owner, Engineer and Contractor during the Project for exchange and storage of Project-related communications and information. Except as otherwise provided in this EDP or the General Conditions, use of the Project Website by the parties as described in this Paragraph will be mandatory for exchange of Project documents, communications,

submittals, and other Project-related information. The following conditions and standards will govern use of the Project Website:

- 1) Describe the period of time during which the Project Website will be operated and be available for reliance by the parties;
- 2) Provide any minimum system infrastructure, software licensing and security standards for access to and use of the Project Website;
- 3) Describe the types and extent of services to be provided at the Project Website (such as large file transfer, email, communication and document archives, etc.); and
- 4) Include any other Project Website attributes that may be pertinent to Contractor's use of the facility and pricing of such use.

C. *Software Requirements for Electronic Document Exchange; Limitations*

1. Each party will acquire the software and software licenses necessary to create and transmit Electronic Documents and to read and to use any Electronic Documents received from the other party (and if relevant from third parties), using the software formats required in this section of the EDP.
 - a. Prior to using any updated version of the software required in this section for sending Electronic Documents to the other party, the originating party will first notify and receive concurrence from the other party for use of the updated version or adjust its transmission to comply with this EDP.
2. The parties agree not to intentionally edit, reverse engineer, decrypt, remove security or encryption features, or convert to another format for modification purposes any Electronic Document or information contained therein that was transmitted in a software data format, including Portable Document Format (PDF), intended by sender not to be modified, unless the receiving party obtains the permission of the sending party or is citing or quoting excerpts of the Electronic Document for Project purposes.
3. Software and data formats for exchange of Electronic Documents will conform to the requirements set forth in Exhibit A to this EDP, including software versions, if listed.

SC-2.06 Supplement Paragraph 2.06 of the General Conditions by adding the following paragraph:

D. *Requests by Contractor for Electronic Documents in Other Formats*

1. Release of any Electronic Document versions of the Project documents in formats other than those identified in the Electronic Documents Protocol (if any) or elsewhere in the Contract will be at the sole discretion of the Owner.
2. To extent determined by Owner, in its sole discretion, to be prudent and necessary, release of Electronic Documents versions of Project documents and other Project information requested by Contractor ("Request") in formats other than those identified in the Electronic Documents Protocol (if any) or elsewhere in the Contract will be subject to the provisions of the Owner's response to the Request, and to the following conditions to which Contractor agrees:
 - a. The content included in the Electronic Documents created by Engineer and covered by the Request was prepared by Engineer as an internal working document for

Engineer's purposes solely, and is being provided to Contractor on an "AS IS" basis without any warranties of any kind, including, but not limited to any implied warranties of fitness for any purpose. As such, Contractor is advised and acknowledges that the content may not be suitable for Contractor's application, or may require substantial modification and independent verification by Contractor. The content may include limited resolution of models, not-to-scale schematic representations and symbols, use of notes to convey design concepts in lieu of accurate graphics, approximations, graphical simplifications, undocumented intermediate revisions, and other devices that may affect subsequent reuse.

- b. Electronic Documents containing text, graphics, metadata, or other types of data that are provided by Engineer to Contractor under the request are only for convenience of Contractor. Any conclusion or information obtained or derived from such data will be at the Contractor's sole risk and the Contractor waives any claims against Engineer or Owner arising from use of data in Electronic Documents covered by the Request.
 - c. Contractor shall indemnify and hold harmless Owner and Engineer and their subconsultants from all claims, damages, losses, and expenses, including attorneys' fees and defense costs arising out of or resulting from Contractor's use, adaptation, or distribution of any Electronic Documents provided under the Request.
 - d. Contractor agrees not to sell, copy, transfer, forward, give away or otherwise distribute this information (in source or modified file format) to any third party without the direct written authorization of Engineer, unless such distribution is specifically identified in the Request and is limited to Contractor's subcontractors. Contractor warrants that subsequent use by Contractor's subcontractors complies with all terms of the Contract Documents and Owner's response to Request.
3. In the event that Owner elects to provide or directs the Engineer to provide to Contractor any Contractor-requested Electronic Document versions of Project information that is not explicitly identified in the Contract Documents as being available to Contractor, the Owner shall be reimbursed by Contractor on an hourly basis (at \$[number] per hour) for any engineering costs necessary to create or otherwise prepare the data in a manner deemed appropriate by Engineer.

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 Intent

SC-3.01 Delete Paragraph 3.01.C in its entirety.

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

4.05 Delays in Contractor's Progress

SC-4.05 Amend Paragraph 4.05.C by adding the following subparagraphs:

5. *Weather-Related Delays* – **See Section 01 2664 – Weather Days.**

ARTICLE 5—SITE, SUBSURFACE AND PHYSICAL CONDITIONS, HAZARDOUS ENVIRONMENTAL CONDITIONS

5.03 *Subsurface and Physical Conditions*

SC-5.03 Add the following new paragraphs immediately after Paragraph 5.03.D:

- E. The following table lists the reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data, and specifically identifies the Technical Data in the report upon which Contractor may rely:

Report Title	Date of Report	Technical Data
No Reports.		

- F. The following table lists the drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data, and specifically identifies the Technical Data upon which Contractor may rely:

Drawings Title	Date of Drawings	Technical Data
No Reports.		

5.06 *Hazardous Environmental Conditions*

SC-5.06 Add the following new paragraphs immediately after Paragraph 5.06.A.3:

- 4. The following table lists the reports known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site, and the Technical Data (if any) upon which Contractor may rely:

Report Title	Date of Report	Technical Data
No Reports.		

- 5. The following table lists the drawings known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site, and Technical Data (if any) contained in such Drawings upon which Contractor may rely:

Drawings Title	Date of Drawings	Technical Data
No Reports.		

ARTICLE 6—BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

SC-6.01 Add the following paragraphs immediately after Paragraph 6.01.A:

- 1. *Required Performance Bond Form:* The performance bond that Contractor furnishes will be in the form of EJCDC® C-610, Performance Bond (2010, 2013, or 2018 edition).

2. *Required Payment Bond Form:* The payment bond that Contractor furnishes will be in the form of EJCDC® C-615, Payment Bond (2010, 2013, or 2018 edition).

SC-6.01 Add the following paragraphs immediately after Paragraph 6.01.B:

1. The correction period specified as one year after the date of Substantial Completion in Paragraph 15.08.A of the General Conditions is hereby revised to be **one** year after Substantial Completion.

6.02 *Insurance—General Provisions*

SC-6.02 Add the following paragraph immediately after Paragraph 6.02.B:

1. Contractor may obtain worker's compensation insurance from an insurance company that has not been rated by A.M. Best, provided that such company (a) is domiciled in the state in which the Project is located, (b) is certified or authorized as a worker's compensation insurance provider by the appropriate state agency, and (c) has been accepted to provide worker's compensation insurance for similar projects by the state within the last 12 months.

6.03 *Contractor's Insurance*

SC-6.03 Supplement Paragraph 6.03 with the following provisions after Paragraph 6.03.C:

- D. *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 claims for:
 1. damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees,
 2. damages insured by reasonably available personal injury liability coverage, and
 3. damages because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.
- G. *Commercial General Liability—Form and Content:* Contractor's commercial liability policy must be written on a 1996 (or later) Insurance Services Organization, Inc. (ISO) commercial general liability form (occurrence form) and include the following coverages and endorsements:
 1. Products and completed operations coverage.
 - a. Such insurance must 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, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.
 3. Severability of interests and no insured-versus-insured or cross-liability exclusions.
 4. Underground, explosion, and collapse coverage.
 5. Personal injury coverage.

6. 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). If Contractor demonstrates to Owner that the specified ISO endorsements are not commercially available, then Contractor may satisfy this requirement by providing equivalent endorsements.
 7. 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.
- H. *Commercial General Liability—Excluded Content:* The commercial general liability insurance policy, including its coverages, endorsements, and incorporated provisions, must not include any of the following:
1. Any modification of the standard definition of “insured contract” (except to delete the railroad protective liability exclusion if Contractor is required to indemnify a railroad or others with respect to Work within 50 feet of railroad property).
 2. Any exclusion for water intrusion or water damage.
 3. Any provisions resulting in the erosion of insurance limits by defense costs other than those already incorporated in ISO form CG 00 01.
 4. Any exclusion of coverage relating to earth subsidence or movement.
 5. Any exclusion for the insured’s vicarious liability, strict liability, or statutory liability (other than worker’s compensation).
 6. Any limitation or exclusion based on the nature of Contractor’s work.
 7. Any professional liability exclusion broader in effect than the most recent edition of ISO form CG 22 79.
- I. *Commercial General Liability—Minimum Policy Limits*

Commercial General Liability	Policy limits of not less than:
General Aggregate	\$1,000,000.00
Products—Completed Operations Aggregate	\$1,000,000.00
Personal and Advertising Injury	\$1,000,000.00
Bodily Injury and Property Damage—Each Occurrence	\$1,000,000.00

- J. *Automobile Liability:* Contractor shall purchase and maintain automobile liability insurance 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 must be written on an occurrence basis.

Automobile Liability	Policy limits of not less than:
Bodily Injury	
Each Person	\$1,000,000.00
Each Accident	\$1,000,000.00

Automobile Liability	Policy limits of not less than:
Property Damage	
Each Accident	\$1,000,000.00

- K. *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 must cover negligent acts, errors, or omissions in the performance of professional design or related services by the insured or others for whom the insured is legally liable. The insurance must be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. The retroactive date on the policy must pre-date the commencement of furnishing services on the Project.

Contractor's Professional Liability	Policy limits of not less than:
Each Claim	\$1,000,000.00
Annual Aggregate	\$1,000,000.00

6.04 Contractor's Responsibilities

ARTICLE 7—LABOR; WORKING HOURS

SC-7.03 SC-7.03 Delete Paragraph 7.03.C in its entirety, and insert the following:

- C. In the absence of any Laws or Regulations to the contrary, Contractor may perform the Work on holidays, during any or all hours of the day, and on any or all days of the week, at Contractor's sole discretion.

SC-7.03 Add the following new paragraph immediately after Paragraph 7.03.C:

- D. **Owner** shall be responsible for the cost of any overtime pay or other expense incurred by the Owner for Engineer's services (including those of the Resident Project Representative, if any), Owner's representative, and construction observation services, occasioned by the performance of Work on Saturday, Sunday, any legal holiday, or as overtime on any regular work day. If Contractor is responsible but does not pay, or if the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under Article 15.

ARTICLE 8—OTHER WORK AT THE SITE

ARTICLE 9—OWNER’S RESPONSIBILITIES

9.13 *Owner’s Site Representative*

SC-9.13 Add the following new paragraph immediately after Paragraph 9.12 of the General Conditions:

9.13 *Owner’s Site Representative*

- A. Owner will furnish an “Owner’s Site Representative” to represent Owner at the Site and assist Owner in observing the progress and quality of the Work. The Owner’s Site Representative is not Engineer’s consultant, agent, or employee.

ARTICLE 10—ENGINEER’S STATUS DURING CONSTRUCTION

10.03 *Resident Project Representative*

SC-10.03 Add the following new subparagraph immediately after Paragraph 10.03.A:

1. On this Project, by agreement with the Owner, the Engineer will not furnish a Resident Project Representative to represent Engineer at the Site or assist Engineer in observing the progress and quality of the Work.

SC-10.03 Add the following new paragraphs immediately after Paragraph 10.03.B:

- C. The Resident Project Representative (RPR) will be Engineer’s representative at the Site. RPR’s dealings in matters pertaining to the Work in general will be with Engineer and Contractor. RPR’s dealings with Subcontractors will only be through or with the full knowledge or approval of Contractor. The RPR will:
 1. *Conferences and Meetings:* Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences, and other Project-related meetings (but not including Contractor’s safety meetings), and as appropriate prepare and circulate copies of minutes thereof.
 2. *Safety Compliance:* Comply with Site safety programs, as they apply to RPR, and if required to do so by such safety programs, receive safety training specifically related to RPR’s own personal safety while at the Site.
 3. *Liaison*
 - a. Serve as Engineer’s liaison with Contractor. Working principally through Contractor’s authorized representative or designee, assist in providing information regarding the provisions and intent of the Contract Documents.
 - b. Assist Engineer in serving as Owner’s liaison with Contractor when Contractor’s operations affect Owner’s on-Site operations.
 - c. Assist in obtaining from Owner additional details or information, when required for Contractor’s proper execution of the Work.
 4. *Review of Work; Defective Work*

- a. Conduct on-Site observations of the Work to assist Engineer in determining, to the extent set forth in Paragraph 10.02, if the Work is in general proceeding in accordance with the Contract Documents.
 - b. Observe whether any Work in place appears to be defective.
 - c. Observe whether any Work in place should be uncovered for observation, or requires special testing, inspection or approval.
5. *Inspections and Tests*
- a. Observe Contractor-arranged inspections required by Laws and Regulations, including but not limited to those performed by public or other agencies having jurisdiction over the Work.
 - b. Accompany visiting inspectors representing public or other agencies having jurisdiction over the Work.
6. *Payment Requests: Review Applications for Payment with Contractor.*
7. *Completion*
- a. Participate in Engineer's visits regarding Substantial Completion.
 - b. Assist in the preparation of a punch list of items to be completed or corrected.
 - c. Participate in Engineer's visit to the Site in the company of Owner and Contractor regarding completion of the Work, and prepare a final punch list of items to be completed or corrected by Contractor.
 - d. Observe whether items on the final punch list have been completed or corrected.
- D. The RPR will not:
1. Authorize any deviation from the Contract Documents or substitution of materials or equipment (including "or-equal" items).
 2. Exceed limitations of Engineer's authority as set forth in the Contract Documents.
 3. Undertake any of the responsibilities of Contractor, Subcontractors, or Suppliers.
 4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of construction.
 5. Advise on, issue directions regarding, or assume control over security or safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.
 6. Participate in specialized field or laboratory tests or inspections conducted off-site by others except as specifically authorized by Engineer.
 7. Authorize Owner to occupy the Project in whole or in part.

ARTICLE 11—CHANGES TO THE CONTRACT

No suggested Supplementary Conditions in this Article.

ARTICLE 12—CLAIMS

No suggested Supplementary Conditions in this Article.

ARTICLE 13—COST OF WORK; ALLOWANCES, UNIT PRICE WORK

13.03 Unit Price Work

SC-13.03 Delete Paragraph 13.03.E in its entirety and insert the following in its place:

E. Adjustments in Unit Price

1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:
 - b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.
2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.
3. Adjusted unit prices will apply to all units of that item.

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

No suggested Supplementary Conditions in this Article.

ARTICLE 15—PAYMENTS TO CONTRACTOR, SET OFFS; COMPLETIONS; CORRECTION PERIOD

15.01 Progress Payments

SC-15.01 Add the following new Paragraph 15.01.F:

- F. For contracts in which the Contract Price is based on the Cost of Work, if Owner determines that progress payments made to date substantially exceed the actual progress of the Work (as measured by reference to the Schedule of Values), or present a potential conflict with the Guaranteed Maximum Price, then Owner may require that Contractor prepare and submit a plan for the remaining anticipated Applications for Payment that will bring payments and progress into closer alignment and take into account the Guaranteed Maximum Price (if any), through reductions in billings, increases in retainage, or other equitable measures. Owner will review the plan, discuss any necessary modifications, and implement the plan as modified for all remaining Applications for Payment.

15.03 Substantial Completion

SC-15.03 Add the following new subparagraph to Paragraph 15.03.B:

1. If some or all of the Work has been determined not to be at a point of Substantial Completion and will require re-inspection or re-testing by Engineer, the cost of such re-inspection or re-testing, including the cost of time, travel and living expenses, will be

paid by Contractor to Owner. If Contractor does not pay, or the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under this Article 15.

15.08 *Correction Period*

SC-15.08 Add the following new Paragraph 15.08.G:

- G. The correction period specified as one year after the date of Substantial Completion in Paragraph 15.08.A of the General Conditions is hereby revised to be the number of years set forth in SC-6.01.B.1; or if no such revision has been made in SC-6.01.B, then the correction period is hereby specified to be **one** year after Substantial Completion.

ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

No suggested Supplementary Conditions in this Article.

ARTICLE 17—FINAL RESOLUTIONS OF DISPUTES

17.02 *Arbitration*

SC-17.02 Add the following new paragraph immediately after Paragraph 17.01.

17.02 *Arbitration*

- A. All matters subject to final resolution under this Article will be settled by arbitration administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules (subject to the conditions and limitations of this Paragraph SC-17.02). Any controversy or claim in the amount of \$100,000 or less will be settled in accordance with the American Arbitration Association's supplemental rules for Fixed Time and Cost Construction Arbitration. This agreement to arbitrate will be specifically enforceable under the prevailing law of any court having jurisdiction.
- B. The demand for arbitration will be filed in writing with the other party to the Contract and with the selected arbitration administrator, and a copy will be sent to Engineer for information. The demand for arbitration will be made within the specific time required in Article 17, or if no specified time is applicable within a reasonable time after the matter in question has arisen, and in no event will any such demand be made after the date when institution of legal or equitable proceedings based on such matter in question would be barred by the applicable statute of limitations.
- C. The arbitrator(s) must be licensed engineers, contractors, attorneys, or construction managers. Hearings will take place pursuant to the standard procedures of the Construction Arbitration Rules that contemplate in-person hearings. The arbitrators will have no authority to award punitive or other damages not measured by the prevailing party's actual damages, except as may be required by statute or the Contract. Any award in an arbitration initiated under this clause will be limited to monetary damages and include no injunction or direction to any party other than the direction to pay a monetary amount.
- D. The Arbitrators will have the authority to allocate the costs of the arbitration process among the parties, but will only have the authority to allocate attorneys' fees if a specific Law or Regulation or this Contract permits them to do so.

- E. The award of the arbitrators must be accompanied by a reasoned written opinion and a concise breakdown of the award. The written opinion will cite the Contract provisions deemed applicable and relied on in making the award.
- F. The parties agree that failure or refusal of a party to pay its required share of the deposits for arbitrator compensation or administrative charges will constitute a waiver by that party to present evidence or cross-examine witness. In such event, the other party shall be required to present evidence and legal argument as the arbitrator(s) may require for the making of an award. Such waiver will not allow for a default judgment against the non-paying party in the absence of evidence presented as provided for above.
- G. No arbitration arising out of or relating to the Contract will include by consolidation, joinder, or in any other manner any other individual or entity (including Engineer, and Engineer's consultants and the officers, directors, partners, agents, employees or consultants of any of them) who is not a party to this Contract unless:
 - 1. the inclusion of such other individual or entity will allow complete relief to be afforded among those who are already parties to the arbitration;
 - 2. such other individual or entity is substantially involved in a question of law or fact which is common to those who are already parties to the arbitration, and which will arise in such proceedings;
 - 3. such other individual or entity is subject to arbitration under a contract with either Owner or Contractor, or consents to being joined in the arbitration; and
 - 4. the consolidation or joinder is in compliance with the arbitration administrator's procedural rules.
- H. The award will be final. Judgment may be entered upon it in any court having jurisdiction thereof, and it will not be subject to modification or appeal, subject to provisions of the Laws and Regulations relating to vacating or modifying an arbitral award.
- I. Except as may be required by Laws or Regulations, neither party nor an arbitrator may disclose the existence, content, or results of any arbitration hereunder without the prior written consent of both parties, with the exception of any disclosure required by Laws and Regulations or the Contract. To the extent any disclosure is allowed pursuant to the exception, the disclosure must be strictly and narrowly limited to maintain confidentiality to the extent possible.

17.03 Attorneys' Fees

SC-17.03 Add the following new paragraph immediately after Paragraph 17.02. [Note: If there is no Paragraph 17.02, because neither arbitration nor any other dispute resolution process has been specified here in the Supplementary Conditions, then revise this to state "Add the following new Paragraph immediately after Paragraph 17.01" and revise the numbering accordingly].

17.03 Attorneys' Fees

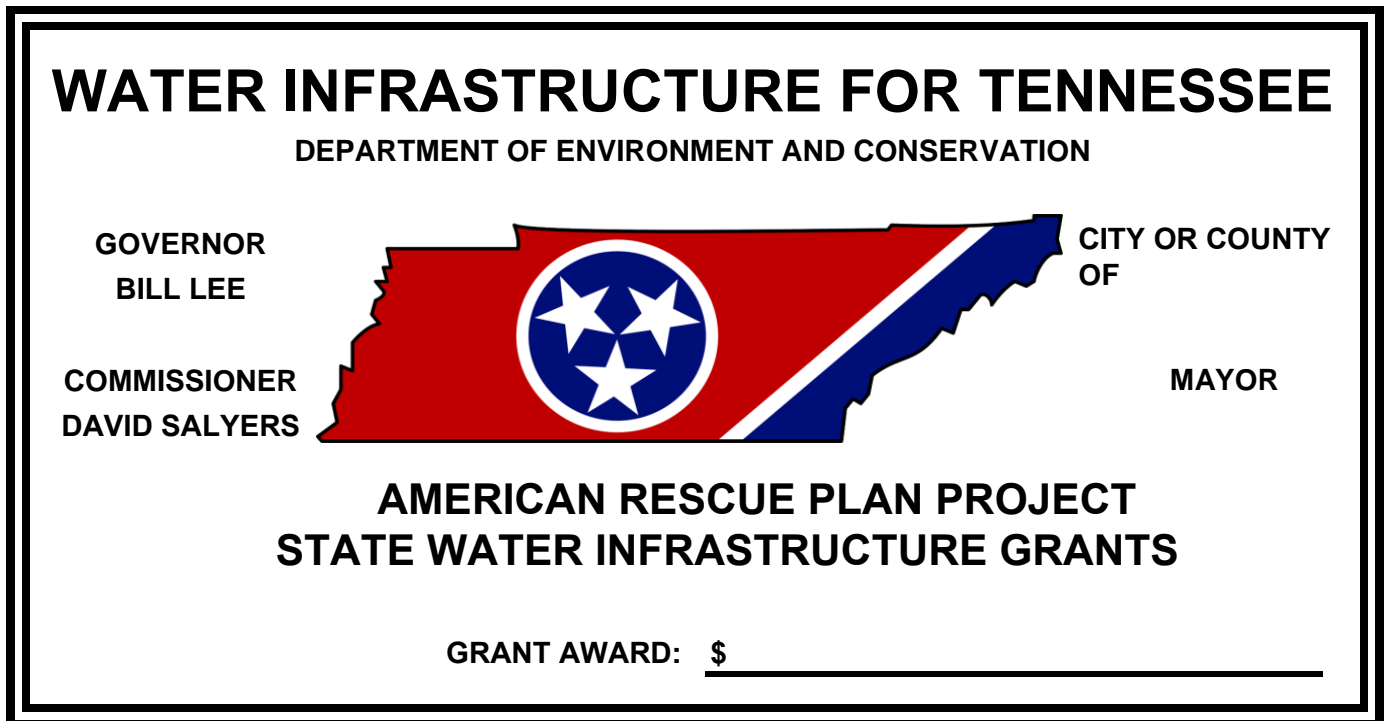
- A. For any matter subject to final resolution under this Article, the prevailing party shall be entitled to an award of its attorneys' fees incurred in the final resolution proceedings, in an equitable amount to be determined in the discretion of the court, arbitrator, arbitration

panel, or other arbiter of the matter subject to final resolution, taking into account the parties' initial demand or defense positions in comparison with the final result.

**STATE WATER INFRASTRUCTURE GRANTS
IDENTIFICATION SIGN**

All plans and specifications for each project approved shall contain provisions for requiring the general contractor to provide identification signs. The signs shall conform to the following basic features:

1. The following diagram shall be used as a design:



2. The sign shall be a 4'0" X 8'0" sheet of exterior grade plywood and shall be built so as to remain erected during the entire construction phase of the project.
3. The background of both sides shall be white. The lettering shall be black and shall be large enough to take advantage of the full size of the plywood. The stars shall be white set on a blue field and surrounded by a white ring placed inside a state map in red with a stripe of white and blue on the right side. The sign shall be bordered by a one-inch blue stripe.

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END OF SECTION

**SECTION 01 1000
SUMMARY**

PART 1 GENERAL

1.01 PROJECT

- A. Project Name: Water Treatment Plant Equipment Upgrades
- B. Owner's Name: Town of Stanton, TN.
- C. Engineer's Name: A2H, Inc..
- D. The Project consists of the construction of utilities as described in the drawings and project manual.

1.02 CONTRACT DESCRIPTION

- A. The work is identified in this section and on Drawings.

1.03 DESCRIPTION OF CONSTRUCTION WORK

- A. Scope of construction work is shown on drawings and specified in other sections.
- B. Civil: construction of 8", 12", 14", 16", and 24" water lines by open cut and directional bore and installation of valves, hydrants, water meters, and other appurtenances.
 - 1. Implementation / Installation
 - a. The Contractor and its representatives shall have a proven program of professional project management to ensure successful system installation. Project managers shall be experienced in managing the design, installation, and optimization of systems. Project management experience shall include system integration and training support.
 - b. The installation process shall include fully automated meter/endpoint installation software that programs the endpoints. Meters and endpoints shall be installed and data collected in the field. All data shall flow from field to Crockett Mills CIS system without the requirement for manual entry. Data collected in the field shall include: Meter Number, Ert ID, final reading, new reading, picture of outgoing meter, and GIS location of meter.
 - c. Installer is responsible for updating customer accounts in billing system by replacing existing meter information with new meter information. Installer must be able to electronically update the system at regular intervals during the installation process to keep billing system current for the purpose of regular reading and billing.
 - d. Installer must use a GPS Unit to capture coordinates of meter locations of all meters installed or retrofitted. Accuracy of meter location to be 3'±. Data file must be differentially corrected. Coordinates to be supplied in latitude and longitude.
 - e. Successful bidder must contact QS/1 Governmental for all fees associated with electronic meter change out process and to include these fees in their bid.
 - f. Contractor shall notify residences of work on their water meter by installing door hangers one day prior to start of work.
 - g. Contractor is responsible for and shall repair all leaks after installation of meters.
 - h. Contractor shall reset any meter vaults displaced during meter installation.
 - i. Contractor shall repair any yard damage to original condition to the satisfaction of the home owner prior to final payment.
- C. Notice: In no event is a product to be used in this project known to contain any hazardous or toxic waste or material, radioactive materials, or other contaminants, the removal of which is required or the maintenance of which is prohibited, regulated or penalized by any local, state, or federal agency, authority or governmental unit. If any product is inadvertently specified which contains such materials, it is the Contractor's, subcontractor's and supplier's obligation and duty to advise the Architect/Engineer of this fact prior to the ordering and/or installing of the product or material.

1.04 DESCRIPTION OF ALTERATIONS WORK

- A. Scope of demolition and removal work is indicated on drawings.
- B. Scope of alterations work is indicated on drawings.
- C. Hazardous Substances: Discovery of a suspected dangerous or hazardous substance during construction stops construction operations and may seriously delay a project. Contractors often encounter asbestos, lead, polychlorinated biphenyls (PCBs), and similar hazardous materials on their construction projects. Because the use of those materials was common until recently, they are often found on renovation projects involving older buildings. AIA Document A201 outlines procedures contractors must follow when suspected dangerous or hazardous substances are uncovered during construction. If the suspect material proves to be a dangerous or hazardous substance, a contractor is not permitted to resume construction operations until the material has been rendered harmless or has been lawfully removed from the site.
- D. Notice: In no event is a product to be used in this project known to contain any hazardous or toxic waste or material, radioactive materials, or other contaminants, the removal of which is required or the maintenance of which is prohibited, regulated or penalized by any local, state, or federal agency, authority or governmental unit. If any product is inadvertently specified which contains such materials, it is the contractor's, subcontractor's and supplier's obligation and duty to advise the Architect/Engineer of this fact prior to the ordering and/or installing of the product or material.

1.05 OWNER OCCUPANCY

- A. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.

1.06 WORK SEQUENCE

- A. Coordinate construction schedule and operations with Engineer.

1.07 ACCIDENT PREVENTION

- A. Contractor shall comply with safety and engineering practices set forth in "Manual of Accident Prevention in Construction", published by Associated General Contractors of America and with all applicable state and local safety and sanitary laws, regulations and ordinances, as well as established safety rules and practices of Owner. Contractor shall, at his own expense, properly protect Owner's property from injury and shall make good any damage to same caused by failure to exercise required care during this work.

PART 2 PRODUCTS - NOT USED**PART 3 EXECUTION - NOT USED****END OF SECTION**

**SECTION 01 2000
PRICE AND PAYMENT PROCEDURES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Procedures for preparation and submittal of applications for progress payments.
- B. Documentation of changes in Contract Sum and Contract Time.
- C. Change procedures.
- D. Correlation of Contractor submittals based on changes.
- E. Procedures for preparation and submittal of application for final payment.

1.02 APPLICATIONS FOR PROGRESS PAYMENTS

- A. Payment Period: Submit at intervals stipulated in the Agreement.
- B. Use Form EJCDC 620 as required by USDA Rural Development..
- C. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Engineer for approval.
- D. Forms filled out by hand will not be accepted.
- E. For each item, provide a column for listing each of the following:
 - 1. Item Number.
 - 2. Description of work.
 - 3. Scheduled Values.
 - 4. Previous Applications.
 - 5. Work in Place and Stored Materials under this Application.
 - 6. Authorized Change Orders.
 - 7. Total Completed and Stored to Date of Application.
 - 8. Percentage of Completion.
 - 9. Balance to Finish.
 - 10. Retainage.
- F. Execute certification by signature of authorized officer.
- G. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.
- H. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of work.
- I. Submit one electronic and three hard-copies of each Application for Payment.
- J. Include the following with the application:
 - 1. Transmittal letter as specified for submittals in Section 01 3000.
 - 2. Project record documents as specified in Section 01 7800, for review by Owner which will be returned to the Contractor.
 - 3. Affidavits attesting to off-site stored products.

1.03 MODIFICATION PROCEDURES

- A. Submit name of the individual authorized to receive change documents and who will be responsible for informing others in Contractor's employ or subcontractors of changes to Contract Documents.
- B. For minor changes not involving an adjustment to the Contract Sum or Contract Time, Engineer will issue instructions directly to Contractor.
- C. For other required changes, Engineer will issue a document signed by Owner instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.

1. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
 2. Promptly execute the change.
- D. For changes for which advance pricing is desired, Engineer will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid.
- E. Contractor may propose a change by submitting a request for change to Engineer, describing the proposed change and its full effect on the work, with a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation.
- F. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.
1. For change requested by Engineer for work falling under a fixed price contract, the amount will be based on Contractor's price quotation.
 2. For change requested by Contractor, the amount will be based on the Contractor's request for a Change Order as approved by Engineer.
 3. For pre-determined unit prices and quantities, the amount will be based on the fixed unit prices.
 4. For change ordered by Engineer without a quotation from Contractor, the amount will be determined by Engineer based on the Contractor's substantiation of costs as specified for Time and Material work.
- G. Substantiation of Costs: Provide full information required for evaluation.
1. On request, provide the following data:
 - a. Quantities of products, labor, and equipment.
 - b. Taxes, insurance, and bonds.
 - c. Overhead and profit.
 - d. Justification for any change in Contract Time.
 - e. Credit for deletions from Contract, similarly documented.
 2. Support each claim for additional costs with additional information:
 - a. Origin and date of claim.
 - b. Dates and times work was performed, and by whom.
 - c. Time records and wage rates paid.
 - d. Invoices and receipts for products, equipment, and subcontracts, similarly documented.
 3. For Time and Material work, submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.
- H. Execution of Change Orders: Engineer will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.
- I. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.
- J. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.
- K. Promptly enter changes in Project Record Documents.

1.04 APPLICATION FOR FINAL PAYMENT

- A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.

- B. Application for Final Payment will not be considered until the following have been accomplished:
1. Completion of items specified for completion beyond time of substantial completion (regardless of whether payment application was previously made).
 2. Assurance, satisfactory to the Owner, that unsettled claims will be settled and that work not actually completed and accepted will be completed without undue delay.
 3. Transmittal of required project construction records to Owner.
 4. Proof, satisfactory to Owner, that taxes, fees and similar obligations of Contractor have been paid.
 5. Removal of temporary facilities, services, surplus materials, rubbish and similar elements.
 6. Change over of door locks and other Contractor's access provisions to Owner's property.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

**SECTION 01 2500
SUBSTITUTION PROCEDURES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Procedural requirements for proposed substitutions.

1.02 RELATED REQUIREMENTS

- A. Section 00 2113 - Instructions to Bidders: Restrictions on timing of substitution requests.
- B. Section 01 3000 - Administrative Requirements: Submittal procedures, coordination.

1.03 DEFINITIONS

- A. Substitutions: Changes from Contract Documents requirements proposed by Contractor to materials, products, assemblies, and equipment.
 - 1. Substitutions for Cause: Proposed due to changed Project circumstances beyond Contractor's control.
 - a. Unavailability.
 - b. Regulatory changes.
 - 2. Substitutions for Convenience: Proposed due to possibility of offering substantial advantage to the Project.
 - a. Substitution requests offering advantages solely to the Contractor will not be considered.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

- A. A Substitution Request for products, assemblies, materials, and equipment constitutes a representation that the submitter:
 - 1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.
 - 2. Agrees to provide the same warranty for the substitution as for the specified product.
 - 3. Agrees to provide same or equivalent maintenance service and source of replacement parts, as applicable.
 - 4. Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to Owner.
 - 5. Waives claims for additional costs or time extension that may subsequently become apparent.
 - 6. Agrees to reimburse Owner and Engineer for review or redesign services associated with re-approval by authorities.
- B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on proposer.
 - 1. Note explicitly any non-compliant characteristics.
- C. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.
 - 1. Forms indicated in the Project Manual are adequate for this purpose, and must be used.
- D. Limit each request to a single proposed substitution item.
 - 1. Submit an electronic document, combining the request form with supporting data into single document.

3.02 SUBSTITUTION PROCEDURES AFTER BIDDING PHASE

- A. Submittal Form (after award of contract):

1. Submit substitution requests by completing CSI/CSC Form 13.1A - Substitution Request (After Bidding/Negotiating). See this form for additional information and instructions. Use only this form; other forms of submission are unacceptable.
- B. Engineer will consider requests for substitutions only within 15 days after date of Agreement.
- C. Submit request for Substitution for Cause within 14 days of discovery of need for substitution, but not later than 14 days prior to time required for review and approval by Engineer, in order to stay on approved project schedule.
- D. Submit request for Substitution for Convenience immediately upon discovery of its potential advantage to the project, but not later than 14 days prior to time required for review and approval by Engineer, in order to stay on approved project schedule.
 1. In addition to meeting general documentation requirements, document how the requested substitution benefits the Owner through cost savings, time savings, greater energy conservation, or in other specific ways.
 2. Document means of coordinating of substitution item with other portions of the work, including work by affected subcontractors.
 3. Bear the costs engendered by proposed substitution of:
 - a. Owner's compensation to the Engineer for any required redesign, time spent processing and evaluating the request.
 - b. Other construction by Owner.
 - c. Other unanticipated project considerations.
- E. Substitutions will not be considered under one or more of the following circumstances:
 1. When they are indicated or implied on shop drawing or product data submittals, without having received prior approval.
 2. Without a separate written request.
 3. When acceptance will require revisions to Contract Documents.

3.03 RESOLUTION

- A. Engineer may request additional information and documentation prior to rendering a decision. Provide this data in an expeditious manner.
- B. Engineer will notify Contractor in writing of decision to accept or reject request.
 1. Engineer's decision following review of proposed substitution will be noted on the submitted form.

3.04 ACCEPTANCE

- A. Accepted substitutions change the work of the Project. They will be documented and incorporated into work of the project by Change Order, Construction Change Directive, Architectural Supplementary Instructions, or similar instruments provided for in the Conditions of the Contract.

3.05 CLOSEOUT ACTIVITIES

- A. See Section 01 7800 - Closeout Submittals, for closeout submittals.
- B. Include completed Substitution Request Forms as part of the Project record. Include both approved and rejected Requests.

END OF SECTION

**SECTION 01 2500.01
SUBSTITUTION REQUEST FORM**

Project: _____ To: _____ Re: _____	Substitution Request Number: _____ From: _____ Date: _____ A/E Project Number: _____ Contract For: _____
--	--

Specification Title: _____	Description: _____
Section: _____	Page: _____ Article/Paragraph: _____

Proposed Substitution: _____

Manufacturer: _____	Address: _____	Phone: _____
Trade Number: _____	Model No.: _____	

Attached data includes product description, specifications, drawings, photographs, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

	Yes	No
The substitution will create an additional cost to the owner?	<input type="checkbox"/>	<input type="checkbox"/>
The substitution will create a savings to the owner?	<input type="checkbox"/>	<input type="checkbox"/>
The substitution is being used for cost saving purposes?	<input type="checkbox"/>	<input type="checkbox"/>
The substitution is being used for the purpose of making installation less difficult?	<input type="checkbox"/>	<input type="checkbox"/>
Please list additional reasons and/or a reason not shown above why this substitution is being requested.	<input type="checkbox"/>	<input type="checkbox"/>

The Undersigned certifies:

Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.

Same warranty will be furnished for proposed substitution as for specified product.

Same maintenance service and source of replacement parts, as applicable, is available.

Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.

Proposed substitution does not affect dimensions and functional clearances.

Payment will be made for changes to building design, including A/E design, detailing and construction costs caused by the substitution.

Submitted by:	_____
Signed by:	_____
Address:	_____
Telephone:	_____

A/E's REVIEW AND ACTION

- Substitution Approved - Make submittals in accordance with Specification Section 01 3000.
- Substitution Approved as Noted - Make submittals in accordance with Specification Section 01 3000.
- Substitution Rejected - Use specified materials.
- Substitution Request Received Too Late - Use specified Materials.

Signed by: _____ Date: _____

Supporting Data

Attached: Drawings Product Data Samples Tests Reports _____

END OF SECTION 01 2500.01

**SECTION 01 2664
WEATHER DAYS**

PART 1 GENERAL

1.01 REQUIREMENTS

- A. Wet Conditions: The required time of completion is given in calendar days in the Bid Form (which becomes part of the Contract). It is expressly understood and agreed, by and between the Contractor and Owner, that the time for completion of the work described in the bid form is a reasonable time for completion of the same, taking into consideration the average climatic range and usual lost time due to normal seasonal weather in this locality.
1. Time for completion in the Bid Form includes the average number of days that are lost due to wet conditions. The table below shows the average number of days lost in each month due to wet conditions on outdoor or exposed interior work of projects. These days are derived from historical data provided by the National Climatic Data Center regarding rainfall for Memphis, TN and Nashville, TN. They represent a number less than the actual number of days of measurable rainfall that can be expected to occur during a twenty-four (24) hour period for the months indicated.

<u>MONTH</u>	<u>AVERAGE DAYS LOST TO NORMAL WET CONDITIONS</u>
January	8
February	8
March	8
April	9
May	7
June	4
July	6
August	5
September	7
October	6
November	6
December	7

2. Based on rainfall data provided by the National Climatic Data Center for Memphis and Nashville. The total contract time includes these days that are expected to be lost each month.
- a. Definition of Rain Day: Precipitation (rain, snow, or ice) in excess of one-tenth of an inch (0.10") liquid measure in a 24 hour period.
- B. Ice, Standing Snow and Frozen Ground:
1. In addition to work being delayed due to wet conditions (See 1.01 A. above), it is recognized that the work may also be delayed due to certain conditions relating to ice, snow and frozen ground; and loss of working time may also be claimed for such last mentioned conditions in accordance with the provisions of this paragraph. The average number of days lost per month in this locality due to ice, standing snow and frozen ground conditions shall be considered zero, however, lost days due to ice, standing snow and frozen ground conditions may be claimed if it is caused by one or more of the following conditions which prevent outside construction activity or access to the site within a 24-hour period:
- a. Ice which does not melt on a substantial portion of the project by 10 A.M.
- b. Temperatures which do not rise above 32 degrees F by 10 A.M.
- c. Standing snow in excess of one inch (1.00").

- d. Precipitation (rain, snow, or ice) in excess of one-tenth of an inch (0.10") liquid measure in a 24 hour period.
- C. Further Provisions Regarding Time for Completion:
1. A weather delay day may be counted, if appropriate, for dry-out days when the following conditions are met:
 - a. If there is a hindrance to site access; work on the envelope of the building such as masonry or roofing; site work such as excavation, backfill, or footings; and site improvements such as paving.
 - b. At a rate no greater than one (1) make-up day for each day or consecutive days of rain beyond the Standard Baseline that total one inch (1.00") or more, liquid measure.
 2. A weather delay day may be counted only if worse than average weather prevents work on the project for 50 percent or more of the Contractor's scheduled work day.
 3. The Contractor must submit Daily Jobsite Work Log showing which and to what extent construction activities have been affected by weather, on a monthly basis.
 4. The Contractor must submit actual weather data to support a claim for the time extension obtained from nearest NOAA weather station or other independently verified source approved by the Owner at the beginning of the project.
 5. The Contractor must maintain a rain gauge, thermometer and clock at the job site. Keep daily records of precipitation, temperature and the time of each occurrence throughout the project.
 6. The Contractor must organize claim and documentation to facilitate evaluation on a basis of calendar month periods, and submit monthly to the Owner.
 7. If an extension of the contract time is appropriate, it shall be effected in accordance with the provisions of the General Conditions of this contract.
 8. No extra cost will be incurred by the Owner for any extra time increase to the contract.

1.02 EXAMPLE

- A. The following example is given for further clarification of how extra time for wet conditions and/or ice, standing snow and frozen ground is to be calculated. If wet conditions were to occur for a total of sixteen (16) days during the month of January, then the extra contract time allowed would be 16 days minus 8 days (from table above), or 8 days which may be rounded up to the nearest whole day. Also, if during the same month there was standing snow on any combination of conditions as in above for three (3) days, then the Contractor would be allowed an extra 3.0 days in addition to the 8.0 days for wet conditions. The Contractor would get a total of 11.0 extra days. No extra cost will be incurred by the Owner for any extra time increase to the Contract.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

**SECTION 01 3000
ADMINISTRATIVE REQUIREMENTS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Preconstruction meeting.
- B. Progress meetings.
- C. Construction progress schedule.
- D. Contractor's daily reports.
- E. Progress photographs.
- F. Coordination drawings.
- G. Submittals for review, information, and project closeout.
- H. Number of copies of submittals.
- I. Requests for Interpretation (RFI) procedures.
- J. Submittal procedures.

1.02 RELATED REQUIREMENTS

- A. Section 00 7200 - General Conditions: Dates for applications for payment.
- B. Section 00 7200 - General Conditions: Duties of the Construction Manager.
- C. Section 00 7300 - Supplementary Conditions: Duties of the Construction Manager.
- D. Section 01 7800 - Closeout Submittals: Project record documents; operation and maintenance data; warranties and bonds.

1.03 PROJECT COORDINATOR

- A. Project Coordinator: Contractor is responsible for Project Coordination.
- B. Cooperate with the Project Coordinator in allocation of mobilization areas of site; for field offices and sheds, for access, traffic, and parking facilities.
- C. During construction, coordinate use of site and facilities through the Project Coordinator.
- D. Coordinate use of temporary utilities and construction facilities.
- E. Coordinate field engineering and layout work under instructions of the Project Coordinator.
- F. Make the following types of submittals to Engineer through the Project Coordinator:
 - 1. Requests for Interpretation.
 - 2. Requests for substitution.
 - 3. Shop drawings, product data, and samples.
 - 4. Test and inspection reports.
 - 5. Design data.
 - 6. Manufacturer's instructions and field reports.
 - 7. Applications for payment and change order requests.
 - 8. Progress schedules.
 - 9. Correction Punch List and Final Correction Punch List for Substantial Completion.
 - 10. Closeout submittals.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRECONSTRUCTION MEETING

- A. Engineer will schedule a meeting after Notice of Award.

- B. Attendance Required:
 - 1. Owner.
 - 2. Engineer.
 - 3. Contractor.
 - 4. Representatives of the major subcontractors.
 - 5. Other representatives.
- C. Agenda:
 - 1. Execution of Owner-Contractor Agreement.
 - 2. Submission of executed bonds and insurance certificates.
 - 3. Distribution of Contract Documents.
 - 4. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
 - 5. Submission of initial Submittal schedule.
 - 6. Designation of personnel representing the parties to Contractor, Owner and Engineer.
 - 7. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
 - 8. Major equipment deliveries and priorities, handling of materials to permit inspection, storage of material off-site.
 - 9. Scheduling. Sequence of critical work. Review of schedules.
 - 10. Use of premises, access to site, field office and storage areas, security procedures and Owner's requirements.
 - 11. Payment procedures after substantial completion.
 - 12. Additional items and subjects requested by the Owner, Contractor and Architect/Engineer.
- D. Engineer will act as chairperson of the meeting; record minutes and distribute copies within two days after meeting to participants, with one copy to Architect/Engineer, Contractor, participants, and those affected by decisions made.

3.02 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of the work at maximum bi-monthly intervals.
- B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.
- C. Agenda:
 - 1. Review minutes of previous meetings.
 - 2. Review of work progress.
 - 3. Field observations, problems, and decisions.
 - 4. Identification of problems that impede, or will impede, planned progress.
 - 5. Review of submittals schedule and status of submittals.
 - 6. Review of RFIs log and status of responses.
 - 7. Maintenance of progress schedule.
 - 8. Corrective measures to regain projected schedules.
 - 9. Planned progress during succeeding work period.
 - 10. Coordination of projected progress.
 - 11. Maintenance of quality and work standards.
 - 12. Effect of proposed changes on progress schedule and coordination.
 - 13. Other business relating to work.
- D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Engineer, Owner, participants, and those affected by decisions made.

3.03 CONSTRUCTION PROGRESS SCHEDULE

- A. Within 10 days after date of the Agreement, submit preliminary schedule defining planned operations for the first 60 days of work, with a general outline for remainder of work.
- B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.
- C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
 - 1. Include written certification that major contractors have reviewed and accepted proposed schedule.
- D. Within 10 days after joint review, submit complete schedule.
- E. Submit updated schedule with each Application for Payment.

3.04 REQUESTS FOR INTERPRETATION (RFI)

- A. Definition: A request seeking one of the following:
 - 1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in Contract Documents.
 - 2. A resolution to an issue which has arisen due to field conditions and affects design intent.
- B. Whenever possible, request clarifications at the next appropriate project progress meeting, with response entered into meeting minutes, rendering unnecessary the issuance of a formal RFI.
- C. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
 - 1. Prepare a separate RFI for each specific item.
 - a. Review, coordinate, and comment on requests originating with subcontractors and/or materials suppliers.
 - b. Do not forward requests which solely require internal coordination between subcontractors.
 - 2. Prepare using an electronic version of the form appended to this section.
 - 3. Combine RFI and its attachments into a single electronic file. PDF format is preferred.
- D. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.
 - 1. Include in each request Contractor's signature attesting to good faith effort to determine from Contract Documents information requiring interpretation.
 - 2. Unacceptable Uses for RFIs: Do not use RFIs to request the following:
 - a. Approval of submittals (use procedures specified elsewhere in this section).
 - b. Approval of substitutions.
 - c. Changes that entail change in Contract Time and Contract Sum (comply with provisions of the Conditions of the Contract).
 - d. Different methods of performing work than those indicated in the Contract Drawings and Specifications (comply with provisions of the Conditions of the Contract).
 - 3. Improper RFIs: Requests not prepared in compliance with requirements of this section, and/or missing key information required to render an actionable response. They will be returned without a response, with an explanatory notation.
 - 4. Frivolous RFIs: Requests regarding information that is clearly indicated on, or reasonably inferable from, Contract Documents, with no additional input required to clarify the question. They will be returned without a response, with an explanatory notation.
 - a. The Owner reserves the right to assess the Contractor for the costs (on time-and-materials basis) incurred by the Engineer, and any of its consultants, due to

processing of such RFIs.

- E. Content: Include identifiers necessary for tracking the status of each RFI, and information necessary to provide an actionable response.
 - 1. Official Project name and number, and any additional required identifiers established in Contract Documents.
 - 2. Owner's, Engineer's, and Contractor's names.
 - 3. Discrete and consecutive RFI number, and descriptive subject/title.
 - 4. Issue date, and requested reply date.
 - 5. Reference to particular Contract Document(s) requiring additional information/interpretation. Identify pertinent drawing and detail number and/or specification section number, title, and paragraph(s).
 - 6. Annotations: Field dimensions and/or description of conditions which have engendered the request.
 - 7. Contractor's suggested resolution: A written and/or a graphic solution, to scale, is required in cases where clarification of coordination issues is involved, for example; routing, clearances, and/or specific locations of work shown diagrammatically in Contract Documents. If applicable, state the likely impact of the suggested resolution on Contract Time or the Contract Sum.
- F. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.
- G. RFI Log: Prepare and maintain a tabular log of RFIs for the duration of the project.
 - 1. Indicate current status of every RFI. Update log promptly and on a regular basis.
 - 2. Note dates of when each request is made, and when a response is received.
 - 3. Highlight items requiring priority or expedited response.
 - 4. Highlight items for which a timely response has not been received to date.
 - 5. Identify and include improper or frivolous RFIs.
- H. Review Time: Engineer will respond and return RFIs to Contractor within seven calendar days of receipt. For the purpose of establishing the start of the mandated response period, RFIs received after 12:00 noon will be considered as having been received on the following regular working day.
 - 1. Response period may be shortened or lengthened for specific items, subject to mutual agreement, and recorded in a timely manner in progress meeting minutes.
- I. Responses: Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in Contractor's belief it is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Order request to Owner.
 - 1. Response may include a request for additional information, in which case the original RFI will be deemed as having been answered, and an amended one is to be issued forthwith. Identify the amended RFI with an R suffix to the original number.
 - 2. Do not extend applicability of a response to specific item to encompass other similar conditions, unless specifically so noted in the response.
 - 3. Upon receipt of a response, promptly review and distribute it to all affected parties, and update the RFI Log.
 - 4. Notify Engineer within seven calendar days if an additional or corrected response is required by submitting an amended version of the original RFI, identified as specified above.

3.05 SUBMITTAL SCHEDULE

- A. Submit to Engineer for review a schedule for submittals in tabular format.
 - 1. Submit at the same time as the preliminary schedule.
 - 2. Coordinate with Contractor's construction schedule and schedule of values.

3. Format schedule to allow tracking of status of submittals throughout duration of construction.
4. Arrange information to include scheduled date for initial submittal, specification number and title, submittal category (for review or for information), description of item of work covered, and role and name of subcontractor.
5. Account for time required for preparation, review, manufacturing, fabrication and delivery when establishing submittal delivery and review deadline dates.
 - a. For assemblies, equipment, systems comprised of multiple components and/or requiring detailed coordination with other work, allow for additional time to make corrections or revisions to initial submittals, and time for their review.

3.06 SUBMITTALS FOR REVIEW

- A. When the following are specified in individual sections, submit them for review:
 1. Product data.
 2. Design data.
 3. Shop drawings.
 4. Other types indicated.
- B. Submit to Engineer for review for the limited purpose of checking for compliance with information given and the design concept expressed in Contract Documents.
- C. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below.

3.07 SUBMITTALS FOR INFORMATION

- A. When the following are specified in individual sections, submit them for information:
 1. Design data.
 2. Sustainability design submittals and reports.
 3. Certificates.
 4. Test reports.
 5. Inspection reports.
 6. Manufacturer's instructions.
 7. Manufacturer's field reports.
 8. Other types indicated.
- B. Submit for Engineer's knowledge as contract administrator or for Owner.

3.08 SUBMITTALS FOR PROJECT CLOSEOUT

- A. Submit Correction Punch List for Substantial Completion.
- B. Submit Final Correction Punch List for Substantial Completion.
- C. When the following are specified in individual sections, submit them at project closeout in compliance with requirements of Section 01 7800 - Closeout Submittals:
 1. Project record documents.
 2. Operation and maintenance data.
 3. Warranties.
 4. Bonds.
 5. Other types as indicated.
- D. Submit for Owner's benefit during and after project completion.

3.09 NUMBER OF COPIES OF SUBMITTALS

- A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.
- B. Documents for Review:

1. Small Size Sheets, Not Larger Than 8-1/2 by 11 inches: Submit one copy; the Contractor shall make Contractor's own copies from original returned by the Engineer after making a file copy.
 2. Larger Sheets, Not Larger Than 36 by 48 inches: Submit two opaque reproductions, plus one copy that will be retained by Engineer.
- C. Documents for Information: Submit one copy.
- D. Extra Copies at Project Closeout.

3.10 SUBMITTAL PROCEDURES

A. General Requirements:

1. All submittals to Architect/Engineer are to be sent via email to: submittals@a2h.com.
2. Use a single transmittal for related items.
3. Submit separate packages of submittals for review and submittals for information, when included in the same specification section.
4. Transmit using approved form.
 - a. Use Contractor's form, subject to prior approval by Engineer.
5. Sequentially identify each item. For revised submittals use original number and a sequential numerical suffix.
6. Identify: Project; Contractor; subcontractor or supplier; pertinent drawing and detail number; and specification section number and article/paragraph, as appropriate on each copy.
7. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents.
 - a. Submittals from sources other than the Contractor, or without Contractor's stamp will not be acknowledged, reviewed, or returned.
8. Deliver each submittal on date noted in submittal schedule, unless an earlier date has been agreed to by all affected parties, and is of the benefit to the project.
 - a. Deliver submittals to Engineer at business address.
 - b. Send submittals in electronic format via email to Engineer.
9. Schedule submittals to expedite the Project, and coordinate submission of related items.
 - a. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
 - b. For sequential reviews involving Engineer's consultants, Owner, or another affected party, allow an additional 7 days.
 - c. For sequential reviews involving approval from authorities having jurisdiction (AHJ), in addition to Engineer's approval, allow an additional 30 days.
10. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.
11. Provide space for Contractor and Engineer review stamps.
12. When revised for resubmission, identify all changes made since previous submission.
13. Distribute reviewed submittals. Instruct parties to promptly report inability to comply with requirements.
14. Incomplete submittals will not be reviewed, unless they are partial submittals for distinct portion(s) of the work, and have received prior approval for their use.
15. Submittals not requested will not be recognized or processed.

B. Product Data Procedures:

1. Submit only information required by individual specification sections.
2. Collect required information into a single submittal.
3. Submit concurrently with related shop drawing submittal.
4. Do not submit (Material) Safety Data Sheets for materials or products.

5. Submit sustainable design reporting submittals under separate cover.
- C. Shop Drawing Procedures:
1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.
 2. Do not reproduce Contract Documents to create shop drawings.
 3. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.
- D. Samples Procedures:
1. Transmit related items together as single package.
 2. Identify each item to allow review for applicability in relation to shop drawings showing installation locations.

3.11 SUBMITTAL REVIEW

- A. Submittals for Review: Engineer will review each submittal, and approve, or take other appropriate action.
- B. Submittals for Information: Engineer will acknowledge receipt and review. See below for actions to be taken.
- C. Engineer's actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.
1. Notations may be made directly on submitted items and/or listed on appended Submittal Review cover sheet.
- D. Architect/Engineer's and consultants' actions on items submitted for review:
1. Authorizing purchasing, fabrication, delivery, and installation:
 - a. No Exceptions Taken: Where the submittal is marked "No Exceptions Taken," the Work covered by the submittal may proceed provided it complies with the Contract Documents. Final acceptance will depend on that compliance. Do not resubmit.
 - b. Exceptions Taken As Noted: Where the submittal is marked "Exceptions Taken As Noted," the work covered by the submittal may proceed provided it complies both with Architect's notations on the submittal and the Contract Documents. Final acceptance will depend on that compliance. Do not resubmit.
 2. Make Corrections Noted: Where submittal is marked "Make Corrections Noted," the work covered by the submittal may proceed provided it complies both with Architect's correction notations on the submittal and the Contract Documents. Final acceptance will depend on that compliance. Do not resubmit.
 3. Not Authorizing fabrication, delivery, and installation:
 - a. Revise and Resubmit: Where the submittal is marked "Revise and Resubmit," do not proceed with the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity for the product submitted. Revise and prepare a new submittal according to Architect's notations and corrections.
 - b. Submit Specified Item: Where the submittal is marked "Submit Specified Item," do not proceed with the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity for the product submitted. Revise and prepare a new submittal according to Architect's notations and corrections.
 - c. Rejected: Where the submittal is marked "Rejected," do not proceed with the Work covered by the submittal. Prepare a new submittal for a product that complies with the Contract Documents.
- E. Engineer's and consultants' actions on items submitted for information:
1. Items for which no action was taken:
 - a. "Received" - to notify the Contractor that the submittal has been received for record only.
 2. Items for which action was taken:

- a. "Reviewed" - no further action is required from Contractor.

END OF SECTION

**SECTION 01 4000
QUALITY REQUIREMENTS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Submittals.
- B. Testing and inspection agencies and services.
- C. Control of installation.
- D. Tolerances.
- E. Manufacturers' field services.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

- A. ASTM C1021 - Standard Practice for Laboratories Engaged in Testing of Building Sealants; 2008 (Reapproved 2023).
- B. ASTM C1077 - Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation; 2017.
- C. ASTM C1093 - Standard Practice for Accreditation of Testing Agencies for Masonry; 2023.
- D. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction; 2019.
- E. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection; 2021.
- F. ASTM E543 - Standard Specification for Agencies Performing Nondestructive Testing; 2021.
- G. ASTM E699 - Standard Specification for Agencies Involved in Testing, Quality Assurance, and Evaluating of Manufactured Building Components; 2016.
- H. IAS AC89 - Accreditation Criteria for Testing Laboratories; 2021.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Test Reports: After each test/inspection, promptly submit two copies of report to Engineer and to Contractor.
 - 1. Include:
 - a. Date issued.
 - b. Project title and number.
 - c. Name of inspector.
 - d. Date and time of sampling or inspection.
 - e. Identification of product and specifications section.
 - f. Location in the Project.
 - g. Type of test/inspection.
 - h. Date of test/inspection.
 - i. Results of test/inspection.
 - j. Compliance with Contract Documents.
 - k. When requested by Engineer, provide interpretation of results.
 - 2. Test report submittals are for Engineer's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for Owner's information.
- C. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Engineer, in quantities

specified for Product Data.

1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
 2. Certificates may be recent or previous test results on material or product, but must be acceptable to Engineer.
- D. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.
- E. Manufacturer's Field Reports: Submit reports for Engineer's benefit as contract administrator or for Owner.
1. Submit report in duplicate within 30 days of observation to Engineer for information.
 2. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents.

1.05 TESTING AND INSPECTION AGENCIES AND SERVICES

- A. Contractor shall employ and pay for services of an independent testing agency to perform other specified testing.
- B. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.
- C. Contractor Employed Agency:
1. Testing agency: Comply with requirements of ASTM E329, ASTM E543, ASTM E699, ASTM C1021, ASTM C1077, ASTM C1093, and ASTM D3740.
 2. Inspection agency: Comply with requirements of ASTM D3740 and ASTM E329.
 3. Laboratory Qualifications: Accredited by IAS according to IAS AC89.
 4. Laboratory: Authorized to operate in Tennessee.
 5. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.
 6. Testing Equipment: Calibrated at reasonable intervals either by NIST or using an NIST established Measurement Assurance Program, under a laboratory measurement quality assurance program.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- D. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Have work performed by persons qualified to produce required and specified quality.
- F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 TOLERANCES

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Engineer before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

3.03 TESTING AND INSPECTION

- A. See individual specification sections for testing and inspection required.
- B. Testing Agency Duties:
 - 1. Test samples of mixes submitted by Contractor.
 - 2. Provide qualified personnel at site. Cooperate with Engineer and Contractor in performance of services.
 - 3. Perform specified sampling and testing of products in accordance with specified standards.
 - 4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 - 5. Promptly notify Engineer and Contractor of observed irregularities or non-compliance of Work or products.
 - 6. Perform additional tests and inspections required by Engineer.
 - 7. Submit reports of all tests/inspections specified.
- C. Limits on Testing/Inspection Agency Authority:
 - 1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 - 2. Agency may not approve or accept any portion of the Work.
 - 3. Agency may not assume any duties of Contractor.
 - 4. Agency has no authority to stop the Work.
- D. Contractor Responsibilities:
 - 1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
 - 2. Cooperate with laboratory personnel, and provide access to the Work.
 - 3. Provide incidental labor and facilities:
 - a. To provide access to Work to be tested/inspected.
 - b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
 - c. To facilitate tests/inspections.
 - d. To provide storage and curing of test samples.
 - 4. Notify Engineer and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
 - 5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
 - 6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
- E. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Engineer.
- F. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

3.04 MANUFACTURERS' FIELD SERVICES

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of

surfaces and installation, quality of workmanship, start-up of equipment, test, adjust, and balance equipment as applicable, and to initiate instructions when necessary.

- B. Submit qualifications of observer to Engineer 30 days in advance of required observations.
 - 1. Observer subject to approval of Engineer.
- C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.05 DEFECT ASSESSMENT

- A. Replace Work or portions of the Work not complying with specified requirements.

END OF SECTION

**SECTION 01 4216
DEFINITIONS**

PART 1 GENERAL

1.01 SUMMARY

- A. General Explanation: A substantial amount of specification language constitutes definitions for terms found in other contract documents, including the drawings which must be recognized as diagrammatic in nature and not completely descriptive of requirements indicated thereon. Certain terms used in the contract documents are defined generally in this article. Definitions and explanations of this section are not necessarily either complete or exclusive, but are general for the work to extents not stated more explicitly in another provisions of the contract documents. This section supplements the definitions contained in the General Conditions.
- B. General Requirements: The provisions or requirements of Division 01 sections. General requirements apply to either work of contract and, where so indicated, to other elements of work which are included in the project. Other definitions are included in individual specification sections.
- C. Other definitions are included in individual specification sections.

1.02 DEFINITIONS

- A. Indicated: The term "Indicated" is a cross-reference to details, notes or schedules on the drawings, to other paragraphs or schedules in the Project Manual, and to similar means of recording requirements in the contract documents. Where terms such as "shown", "noted", "scheduled", and "specified" are used in lieu of "indicated", it is for the purpose of helping the reader locate cross-reference, and no limitation of location is intended except as specifically noted.
- B. Directed, Requested, etc.: Where not otherwise explained, terms such as "directed", "requested", "authorized", "selected", "approved", "required", "accepted" and "permitted" mean "directed by Architect/Engineer", "requested by Architect/Engineer", etc. However, no such implied meaning will be interpreted to extend Architect/Engineer's responsibility into Contractor's area of construction supervision.
- C. Approved: Where used in conjunction with Architect/Engineer's response to submittals, requests, applications, inquiries, reports and claims by Contractor, the meaning of term "approved" will be held to limitations of Architect/Engineer's responsibility and duties as specified in general and Supplementary Conditions. In no case will "approval" by Architect/Engineer be interpreted as a release of Contractor from responsibilities to fulfill requirements of the contract documents.
- D. Project Site: The space available to Contractor for performance of the work, either exclusively or in conjunction with others performing other work as part of the project. The extent of project site is shown on the drawings, and may or may not be identical with description of the land upon which project is to be built.
- E. Furnish: To supply, deliver, unload, and inspect for damage.
- F. Install: To unpack, assemble, erect, apply, place, finish, cure, protect, clean, start up, and make ready for use.
- G. Provide: Except as otherwise defined in greater detail, term "provide" means furnish and install, complete and ready for intended use, as applicable in each instance.
- H. Installer: The entity (person or firm) engaged by the Contractor or its subcontractor or sub subcontractor for the performance of a particular unit of work at the project site, including installation, erection, application, and similar required operations. It is a general requirement that such entities (installers) be expert in operations they are engaged to perform.

- I. Testing Laboratory: An independent entity engaged to perform specific inspections or tests of the work, at project site and to report and (if required) interpret results of those inspections or tests. Refer to Section 01 4000
- J. Product: Material, machinery, components, equipment, fixtures, and systems forming the work result. Not materials or equipment used for preparation, fabrication, conveying, or erection and not incorporated into the work result. Products may be new, never before used, or re-used materials or equipment.
- K. Project Manual: The book-sized volume that includes the procurement requirements (if any), the contracting requirements, and the specifications.

1.03 FORMAT AND SPECIFICATION EXPLANATIONS

- A. Specification Production: None of these explanations will be interpreted to modify substance of requirements. Portions of these specifications have been produced by Architect's standard methods of editing master specifications, and may contain minor deviations from traditional writing formats. Such deviations are a normal result of this production technique, and no other meaning will be implied or permitted.
- B. Format Explanation: The format of principal portions of these specifications can be described as follows; although other portions may not fully comply and no particular significance will be attached to such compliance or non-compliance:
 - 1. Sections and Divisions: For convenience, basic unit of specification text is a "section", each unit of which is named and numbered. These are organized into related families of sections, and various families of sections are organized into "divisions", which are recognized as the present industry - consensus on uniform organization and sequencing of specifications. The section title is not intended to limit meaning or content of section, nor to be fully descriptive of requirements specified therein, nor to be an integral part of text.
 - a. Each section of specifications has been subdivided into 3 (or less), "parts" for uniformity and convenience (Part 1 - General, Part 2 - Products, and Part 3 - Execution). These do not limit the meaning and are not an integral part of text which specifies requirements.
- C. Imperative Language: Used generally in specifications. Except as otherwise indicated, requirements expressed imperatively are to be performed by Contractor. For clarity of reading at certain locations, contrasting subjective language is used to describe responsibilities which must be fulfilled indirectly by Contractor, or when so noted, by others.
- D. Section Numbering: Used to facilitate cross-references in contract documents. Sections are placed in Project Manual in numeric sequence; however, numbering sequence is not complete, and listing of sections at beginning of Project Manual must be consulted to determine numbers and names of specification sections in the contract documents.
- E. Page Numbering: Numbered independently for each section; recorded in listing of section (Index or Table of Contents) in Project Manual. Section number is shown with page number at bottom of each page, to facilitate location of text in Project Manual.
- F. Specification Content: Because of methods by which this project specification has been produced, certain general characteristics of content, and conventions in use of language are explained as follows:
 - 1. Specifying Methods: The techniques or methods of specifying to record requirements varies throughout text, and may include "prescriptive", "open generic - descriptive", "compliance with standards", "performance", "proprietary" or a combination of these. The method used for specifying one unit of work has no bearing on requirements for another unit of work.
 - 2. Overlapping and Conflicting Requirements: Where compliance with 2 or more industry standards or sets of requirements is specified, and overlapping of those different

standards or requirements establishes different or conflicting minimum or levels of quality, the most stringent requirement (which is generally recognized to be most costly) is intended and will be enforced, unless specifically detailed language written into the contract documents (not by way of reference to an industry standard) clearly indicates that a less stringent requirement is to be fulfilled. Refer apparently-equal-but-different requirements and uncertainties as to which level of quality is more stringent to Architect for decision before proceeding.

- a. Contractor's Options: Except for overlapping or conflicting requirements, where more than one set of requirements are specified for a particular unit of work, option is intended to be contractor's regardless of whether specifically indicated as such.
3. Minimum Quality/Quantity: In every instance, quality level or quantity shown or specified is intended as minimum for the work to be performed or provided. Except as otherwise specifically indicated, actual work may either comply exactly with that minimum within specified tolerances, or may exceed that minimum within reasonable limits. In complying with requirements, indicated numeric values are either minimums or maximums as noted or as appropriate for context of requirements. Refer instances of uncertainty to Architect for decision before proceeding.
4. Specialist's Assignments: In certain instances, specification text requires (or at least implies) that specific work be assigned to specialists or expert entities, who must be engaged for performance of those units of work. These must be recognized as special requirements over which Contractor has no choice or option. These assignments must not be confused with (and are not intended to interfere with) normal application of regulations, union jurisdictions and similar conventions. One purpose of such assignments is to establish which party or entity involved in a specific unit of work is recognized as "expert" for indicated construction processes or operations. Nevertheless, final responsibility for fulfillment of entire set of requirements remains with Contractor.
5. Trades: Except as otherwise indicated, the use of titles (such as "carpentry") in specification text, implies neither that the work must be performed by an accredited or unionized tradesman of the corresponding generic name (such as "carpenter"), nor that specified requirements apply exclusively to work by tradesman of the corresponding generic name.
6. Abbreviations: The language of specifications and other contract documents is of the abbreviated type in certain instances, and implies words and meanings which will be appropriately interpreted. Actual work abbreviations of a self-explanatory nature have been included in the text. Specific abbreviations have been established, principally for lengthy technical terminology and primarily in conjunction with coordination of specification requirements with notations on drawings and in schedules.
 - a. These are frequently defined in sections at first instance of use. Trade association names and titles of general standards are frequently abbreviated. Singular words will be interpreted as plural and plural words will be interpreted as singular where applicable and where full context of the contract documents so indicate.

1.04 DRAWING SYMBOLS

- A. General: Except as otherwise indicated, graphic symbols used on drawings are those symbols recognized in the construction industry for purposes indicated. Where not otherwise noted, symbols are defined by "Architectural Graphic Standards", published by John Wiley & Sons, Inc., latest edition.

1.05 INDUSTRY STANDARDS

- A. General Applicability of Standards: Applicable standards of construction industry have same force and effect (and are made a part of contract documents by reference) as if copied directly into contract documents, or as if published copies were bound herewith.
 1. Referenced standards (referenced directly in contract documents or by governing regulations) have precedence over non-referenced standards which are recognized in

- industry for applicability to work.
2. Non-referenced standards recognized in the construction industry are hereby defined, except as otherwise limited in contract documents, to have direct applicability to the work, and will be so enforced for performance of the work.
 - B. Publication Dates: Except as otherwise indicated, where compliance with an industry standard is required, comply with standard in effect as of date in contract documents.
 - C. Copies of Standards: Provide where needed for proper performance of the work; obtain directly from publication sources.
 - D. Abbreviations and Names: Where acronyms or abbreviations are used in specifications or other contract documents they are defined to mean the industry recognized name and trade association, standards generating organization, governing authority or other "Encyclopedia of Associations", published by Gale Research Co., available in large libraries.

1.06 GOVERNING REGULATIONS/AUTHORITIES

- A. General: The procedure followed by the Architect has been to contact governing authorities where necessary to obtain information needed for the purpose of preparing the contract documents; recognizing that such information may or may not be of significance in relation to the Contractor's responsibilities for performing the work. Contact governing authorities directly for necessary information and decisions having a bearing on the performance of the work.

1.07 SUBMITTAL

- A. Permits, Licenses and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence and records established in conjunction with compliance with standards and regulations bearing upon performance of the work.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

**SECTION 01 5000
TEMPORARY FACILITIES AND CONTROLS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Waste removal facilities and services.
- B. Project identification sign.
- C. Field offices.

1.02 BARRIERS

- A. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.03 WASTE REMOVAL

- A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
- B. Provide containers with lids. Remove trash from site weekly.
- C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.

1.04 PROJECT IDENTIFICATION

- A. Provide project identification sign of design and construction indicated on drawings.
- B. Erect on site at location indicated.
- C. No other signs are allowed without Owner permission except those required by law.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

**SECTION 01 5713
TEMPORARY EROSION AND SEDIMENT CONTROL**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Prevention of erosion due to construction activities.
- B. Prevention of sedimentation of waterways, open drainage ways, and storm and sanitary sewers due to construction activities.
- C. Restoration of areas eroded due to insufficient preventive measures.
- D. Performance bond.
- E. Compensation of Owner for fines levied by authorities having jurisdiction due to non-compliance by Contractor.

1.02 PERFORMANCE REQUIREMENTS

- A. Comply with requirements of EPA (NPDES) for erosion and sedimentation control, as specified by the NPDES, for Phases I and II, and in compliance with requirements of Construction General Permit (CGP), whether the project is required by law to comply or not.
- B. Also comply with all more stringent requirements of State of Tennessee Erosion and Sedimentation Control Manual.
- C. Best Management Practices Standard: FHWA FLP-94-005.
- D. Runoff Calculation Standard for Urban Areas: USDA TR-55.
- E. Develop and follow an Erosion and Sedimentation Prevention Plan and submit periodic inspection reports.
- F. Do not begin clearing, grading, or other work involving disturbance of ground surface cover until applicable permits have been obtained; furnish all documentation required to obtain applicable permits.
 - 1. Obtain and pay for permits and provide security required by authority having jurisdiction.
 - 2. Owner will withhold payment to Contractor equivalent to all fines resulting from non-compliance with applicable regulations.
- G. Provide to Owner a Performance Bond covering erosion and sedimentation preventive measures only, in an amount equal to 100 percent of the cost of erosion and sedimentation control work.
- H. Timing: Put preventive measures in place as soon as possible after disturbance of surface cover and before precipitation occurs.
- I. Storm Water Runoff: Control increased storm water runoff due to disturbance of surface cover due to construction activities for this project.
 - 1. Prevent runoff into storm and sanitary sewer systems, including open drainage channels, in excess of actual capacity or amount allowed by authorities having jurisdiction, whichever is less.
 - 2. Anticipate runoff volume due to the most extreme short term and 24-hour rainfall events that might occur in 25 years.
- J. Erosion On Site: Minimize wind, water, and vehicular erosion of soil on project site due to construction activities for this project.
 - 1. Control movement of sediment and soil from temporary stockpiles of soil.
 - 2. Prevent development of ruts due to equipment and vehicular traffic.
 - 3. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.

- K. Erosion Off Site: Prevent erosion of soil and deposition of sediment on other properties caused by water leaving the project site due to construction activities for this project.
 - 1. Prevent windblown soil from leaving the project site.
 - 2. Prevent tracking of mud onto public roads outside site.
 - 3. Prevent mud and sediment from flowing onto sidewalks and pavements.
 - 4. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.
- L. Sedimentation of Waterways On Site: Prevent sedimentation of waterways on the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
 - 1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.
 - 2. If sediment basins are used as temporary preventive measures, pump dry and remove deposited sediment after each storm.
- M. Sedimentation of Waterways Off Site: Prevent sedimentation of waterways off the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
 - 1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.
- N. Open Water: Prevent standing water that could become stagnant.
- O. Maintenance: Maintain temporary preventive measures until permanent measures have been established.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Erosion and Sedimentation Control Plan:
 - 1. Submit within 2 weeks after Notice to Proceed.
 - 2. Include:
 - a. Site plan identifying soils and vegetation, existing erosion problems, and areas vulnerable to erosion due to topography, soils, vegetation, or drainage.
 - b. Measurements of existing turbidity of waterways.
 - c. Site plan showing grading; new improvements; temporary roads, traffic accesses, and other temporary construction; and proposed preventive measures.
 - d. Where extensive areas of soil will be disturbed, include storm water flow and volume calculations, soil loss predictions, and proposed preventive measures.
 - e. Schedule of temporary preventive measures, in relation to ground disturbing activities.
 - f. Other information required by law.
 - g. Format required by law is acceptable, provided any additional information specified is also included.
 - 3. Obtain the approval of the Plan by authorities having jurisdiction.
 - 4. Obtain the approval of the Plan by Owner.
- C. Certificate: Mill certificate for silt fence fabric attesting that fabric and factory seams comply with specified requirements, signed by legally authorized official of manufacturer; indicate actual minimum average roll values; identify fabric by roll identification numbers.
- D. Inspection Reports: Submit report of each inspection; identify each preventive measure, indicate condition, and specify maintenance or repair required and accomplished.

- E. Maintenance Instructions: Provide instructions covering inspection and maintenance for temporary measures that must remain after Substantial Completion.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Mulch: Use one of the following:
1. Straw or hay.
 2. Wood waste, chips, or bark.
 3. Erosion control matting or netting.
 4. Cutback asphalt.
 5. Polyethylene film, where specifically indicated only.
- B. Grass Seed For Temporary Cover: Select a species appropriate to climate, planting season, and intended purpose. If same area will later be planted with permanent vegetation, do not use species known to be excessively competitive or prone to volunteer in subsequent seasons.
- C. Bales: Air dry, rectangular straw bales.
1. Cross Section: 14 by 18 inches, minimum.
 2. Bindings: Wire or string, around long dimension.
- D. Bale Stakes: One of the following, minimum 3 feet long:
1. Steel U- or T-section, with minimum mass of 1.33 pound per linear foot.
 2. Wood, 2 by 2 inches in cross section.
- E. Silt Fence Fabric: Polypropylene geotextile resistant to common soil chemicals, mildew, and insects; non-biodegradable; in longest lengths possible; fabric including seams with the following minimum average roll lengths:
1. Average Opening Size: 30 U.S. Std. Sieve, maximum, when tested in accordance with ASTM D4751.
 2. Permittivity: 0.05 sec^{-1} , minimum, when tested in accordance with ASTM D4491/D4491M.
 3. Ultraviolet Resistance: Retaining at least 70 percent of tensile strength, when tested in accordance with ASTM D4355/D4355M after 500 hours exposure.
 4. Tensile Strength: 100 pounds-force, minimum, in cross-machine direction; 124 pounds-force, minimum, in machine direction; when tested in accordance with ASTM D4632/D4632M.
 5. Elongation: 15 to 30 percent, when tested in accordance with ASTM D4632/D4632M.
 6. Tear Strength: 55 pounds-force, minimum, when tested in accordance with ASTM D4533/D4533M.
 7. Color: Manufacturer's standard, with embedment and fastener lines preprinted.
 8. Manufacturers:
 - a. TenCate: www.tencate.com.
 - b. Propex Geosynthetics: www.geotextile.com.
 - c. Approved equal.
- F. Silt Fence Posts: One of the following, minimum 5 feet long:
1. Steel U- or T-section, with minimum mass of 1.33 pound per linear foot.
 2. Softwood, 4 by 4 inches in cross section.
 3. Hardwood, 2 by 2 inches in cross section.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine site and identify existing features that contribute to erosion resistance; maintain such existing features to greatest extent possible.

3.02 PREPARATION

- A. At the pre-construction conference, the Contractor shall submit for acceptance his schedule for accomplishment of temporary and permanent erosion control work, as is applicable for clearing and grubbing, grading, bridges and other structures at watercourses, construction and paving. He shall also submit for acceptance his proposed method for erosion control on haul roads and borrow pits and his plan for disposal of waste materials. No work shall be started until the erosion control schedules and methods of operations have been accepted by the Engineer.
- B. Schedule work so that soil surfaces are left exposed for the minimum amount of time.

3.03 SCOPE OF PREVENTIVE MEASURES

- A. This section shall consist of temporary control measures as shown in the Plans or directed by the Engineer during the life of the Contract to control erosion and pollution through the use of berms, dikes, dams, sediment basins, fiber mats, netting, mulches, grasses, slope drains, temporary silt fences, and other control devices.
- B. The temporary pollution control provisions contained herein shall be coordinated with the permanent erosion control features to assure economical, effective, and continuous erosion features and to assure economical, effective, and continuous erosion control throughout the construction and post-construction period.
- C. The Engineer has the authority to limit the surface area of erodible earth material exposed by clearing and grubbing, the surface of erodible earth material exposed by excavation, borrow and fill operations and to direct the Contractor to provide immediate permanent or temporary pollution control measures to prevent contamination of adjacent streams or other watercourses, lakes, ponds, or other water impoundment. Such work may involve the construction of temporary berms, dikes, dams, sediment basins, slope drains and use of temporary mulches, mats, seeding or other control devices or methods to control erosion. Cut and fill slopes shall be seeded and mulched as the excavation proceeds to the extent directed by the Engineer.
- D. The Contractor shall be required to incorporate all permanent erosion control features into the project at the earliest practicable time as outlined in his accepted schedule. Temporary pollution control measures shall be used to correct conditions that develop during construction that were not foreseen during the design stage; that are needed prior to installation of permanent pollution control features; or that are needed temporarily to control erosion that develops during normal construction practices, but are not associated with permanent control features on the project.
- E. Where erosion is likely to be a problem, clearing and grubbing operations should be so scheduled and performed that grading operations and permanent erosion control features can follow immediately thereafter if the project conditions permit; otherwise erosion control measures may be required between successive construction stages. Under no conditions shall the surface area of erodible earth material exposed at one time by clearing and grubbing exceed 750,000 square feet without approval of the Engineer.
- F. The Engineer will limit the area of excavation, borrow and embankment operations in progress commensurate with the Contractor's capability and progress in keeping the finish grading, mulching, seeding, and other such permanent pollution control measures current in accordance with the accepted schedule. Should seasonal limitations make such coordination unrealistic, temporary erosion control measures shall be taken immediately to the extent feasible and justified.
- G. Under no conditions shall the amount of surface area or erodible earth material exposed at one time by excavation or fill within the project area exceed 750,000 square feet without prior approval by the Engineer.
- H. The Engineer may increase or decrease the amount of surface area of erodible earth material to be exposed at one time by clearing and grubbing, excavation, borrow, and fill operations as determined by his analysis of project conditions.

- I. In the event of conflict between these requirements and pollution control laws, rules or regulations, or other Federal, State, or Local agencies, the more restrictive laws, rules and regulations shall apply.
- J. In all cases, if permanent erosion resistant measures have been installed temporary preventive measures are not required.
- K. Temporary Berms: A temporary berm is constructed of compacted soil, with or without a shallow ditch at the top of fill slopes or transverse to centerline on fills.
- L. Temporary Slope Drains: A temporary slope drain is a facility consisting of stone gutters, fiber mats, plastic sheets, concrete or asphalt gutters, half-round pipe, metal pipe, plastic pipe, sod or other material acceptable to the Engineer that may be used to carry water down slopes to reduce erosion.
- M. Sediment Structures: Sediment basins, ponds and traps are prepared storage areas constructed to trap and store sediment from erodible areas in order to protect properties and stream channels below the constructed areas from excessive siltation.
- N. Check Dams: Check dams are barriers composed of logs and poles, large stones or other materials placed across a natural or constructed drainway. Stone check dams shall not be utilized where the drainage area exceeds fifty (50) acres. Log and pole structures shall not be used where the drainage area exceeds five (5) acres.
- O. Temporary Seeding and Mulching: Temporary seeding and mulching are measures consisting of seeding, mulching, fertilizing and matting utilized to reduce erosion. All cut and fill slopes including waste sites and borrow pits shall be seeded when and where necessary to eliminate erosion.
- P. Brush Barriers: Brush barriers shall consist of brush, tree trimmings, shrubs, plants, and other approved refuse from the clearing and grubbing operations. Brush barriers are placed on natural ground at the bottom of fill slopes, where the most likely erodible areas are located to restrain sedimentation particles.
- Q. Baled Hay or Straw Checks: Baled hay or straw erosion checks are temporary measures to control erosion and prevent siltation. Bales shall be either hay or straw containing five (5) cubic feet or more of material. Baled hay or straw checks shall be used where the existing ground slopes toward or away from the embankment along the toe of the slopes, in ditches or other areas where siltation erosion or water run-off is a problem.
- R. Temporary Silt Fences: Silt fences are temporary measures utilizing woven wire or other approved material attached to post with filter cloth composed of burlap, plastic filter fabric, etc., attached to the upstream side of the fence to retain the suspended silt particles in the run-off water.
- S. Construction Entrances: Traffic-bearing aggregate surface.
 - 1. Width: As required; 20 feet, minimum.
 - 2. Length: 50 feet, minimum.
 - 3. Provide at each construction entrance from public right-of-way.
 - 4. Where necessary to prevent tracking of mud onto right-of-way, provide wheel washing area out of direct traffic lane, with drain into sediment trap or basin.
- T. Linear Sediment Barriers: Made of silt fences.
 - 1. Provide linear sediment barriers:
 - a. Along downhill perimeter edge of disturbed areas, including soil stockpiles.
 - b. Along the top of the slope or top bank of drainage channels and swales that traverse disturbed areas.
 - c. Along the toe of cut slopes and fill slopes.
 - d. Perpendicular to flow across the bottom of existing and new drainage channels and swales that traverse disturbed areas or carry runoff from disturbed areas; space at

- maximum of 200 feet apart.
- e. Across the entrances to culverts that receive runoff from disturbed areas.
- 2. Space sediment barriers with the following maximum slope length upslope from barrier:
 - a. Slope of Less Than 2 Percent: 100 feet..
 - b. Slope Between 2 and 5 Percent: 75 feet.
 - c. Slope Between 5 and 10 Percent: 50 feet.
 - d. Slope Between 10 and 20 Percent: 25 feet.
 - e. Slope Over 20 Percent: 15 feet.
- U. Storm Drain Curb Inlet Sediment Trap: Protect each curb inlet using one of the following measures:
 - 1. Filter fabric wrapped around hollow concrete blocks blocking entire inlet face area; use one piece of fabric wrapped at least 1-1/2 times around concrete blocks and secured to prevent dislodging; orient cores of blocks so runoff passes into inlet.
 - 2. Straw bale row blocking entire inlet face area; anchor into pavement.
- V. Storm Drain Drop Inlet Sediment Traps: As detailed on drawings.
- W. Temporary Splash Pads: Stone aggregate over filter fabric; size to suit application; provide at downspout outlets and storm water outlets.
- X. Soil Stockpiles: Protect using one of the following measures:
 - 1. Cover with polyethylene film, secured by placing soil on outer edges.
 - 2. Cover with mulch at least 4 inches thickness of pine needles, sawdust, bark, wood chips, or shredded leaves, or 6 inches of straw or hay.
- Y. Mulching: Use only for areas that may be subjected to erosion for less than 6 months.
 - 1. Wood Waste: Use only on slopes 3:1 or flatter; no anchoring required.
 - 2. Asphalt: Use only where no traffic, either vehicular or pedestrian, is anticipated.
- Z. Temporary Seeding: Use where temporary vegetated cover is required.

3.04 INSTALLATION

- A. Traffic-Bearing Aggregate Surface:
 - 1. Excavate minimum of 6 inches.
 - 2. Place geotextile fabric full width and length, with minimum 12 inch overlap at joints.
 - 3. Place and compact at least 6 inches of 1 1/2 to 3 1/2 inch diameter stone.
- B. Silt Fences:
 - 1. Store and handle fabric in accordance with ASTM D4873/D4873M.
 - 2. Where slope gradient is less than 3:1 or barriers will be in place less than 6 months, use nominal 16 inch high barriers with minimum 36 inch long posts spaced at 6 feet maximum, with fabric embedded at least 4 inches in ground.
 - 3. Where slope gradient is steeper than 3:1 or barriers will be in place over 6 months, use nominal 28 inch high barriers, minimum 48 inch long posts spaced at 6 feet maximum, with fabric embedded at least 6 inches in ground.
 - 4. Where slope gradient is steeper than 3:1 and vertical height of slope between barriers is more than 20 feet, use nominal 32 inch high barriers with woven wire reinforcement and steel posts spaced at 4 feet maximum, with fabric embedded at least 6 inches in ground.
 - 5. Install with top of fabric at nominal height and embedment as specified.
 - 6. Embed bottom of fabric in a trench on the upslope side of fence, with 2 inches of fabric laid flat on bottom of trench facing upslope; backfill trench and compact.
 - 7. Do not splice fabric width; minimize splices in fabric length; splice at post only, overlapping at least 18 inches, with extra post.
 - 8. Fasten fabric to wood posts using one of the following:
 - a. Four nails per post with 3/4 inch diameter flat or button head, 1 inch long, and 14 gauge, 0.083 inch shank diameter.

- b. Five staples per post with at least 17 gauge, 0.0453 inch wire, 3/4 inch crown width and 1/2 inch long legs.
 9. Fasten fabric to steel posts using wire, nylon cord, or integral pockets.
 10. Wherever runoff will flow around end of barrier or over the top, provide temporary splash pad or other outlet protection; at such outlets in the run of the barrier, make barrier not more than 12 inches high with post spacing not more than 4 feet.
- C. Straw Bale Rows:
1. Install bales in continuous rows with ends butting tightly, with one bale at each end of row turned uphill.
 2. Install bales so that bindings are not in contact with the ground.
 3. Embed bales at least 4 inches in the ground.
 4. Anchor bales with at least two stakes per bale, driven at least 18 inches into the ground; drive first stake in each bale toward the previously placed bale to force bales together.
 5. Fill gaps between ends of bales with loose straw wedged tightly.
 6. Place soil excavated for trench against bales on the upslope side of the row, compacted.
- D. Mulching Over Large Areas:
1. Dry Straw and Hay: Apply 2-1/2 tons per acre; anchor using dull disc harrow or emulsified asphalt applied using same spraying machine at 100 gallons of water per ton of mulch.
 2. Wood Waste: Apply 6 to 9 tons per acre.
 3. Asphalt: Apply at 1200 gallons per acre.
 4. Erosion Control Matting: Comply with manufacturer's instructions.
- E. Mulching Over Small and Medium Areas:
1. Dry Straw and Hay: Apply 4 to 6 inches depth.
 2. Wood Waste: Apply 2 to 3 inches depth.
 3. Pine Needles: Apply 2 to 3 inches depth.
 4. Asphalt: Apply 1/4 gallon per square yard.
 5. Erosion Control Matting: Comply with manufacturer's instructions.
- F. Temporary Seeding:
1. When hydraulic seeder is used, seedbed preparation is not required.
 2. When surface soil has been sealed by rainfall or consists of smooth undisturbed cut slopes, and conventional or manual seeding is to be used, prepare seedbed by scarifying sufficiently to allow seed to lodge and germinate.
 3. If temporary mulching was used on planting area but not removed, apply nitrogen fertilizer at 1 pound per 1000 sq ft.
 4. On soils of very low fertility, apply 10-10-10 fertilizer at rate of 12 to 16 pounds per 1000 sq ft.
 5. Incorporate fertilizer into soil before seeding.
 6. Apply seed uniformly; if using drill or cultipacker seeders place seed 1/2 to 1 inch deep.
 7. Irrigate as required to thoroughly wet soil to depth that will ensure germination, without causing runoff or erosion.
 8. Repeat irrigation as required until grass is established.

3.05 MAINTENANCE

- A. Inspect preventive measures weekly, within 24 hours after the end of any storm that produces 0.5 inches or more rainfall at the project site, and daily during prolonged rainfall.
- B. Repair deficiencies immediately.
- C. Silt Fences:
 1. Promptly replace fabric that deteriorates unless need for fence has passed.
 2. Remove silt deposits that exceed one-third of the height of the fence.

3. Repair fences that are undercut by runoff or otherwise damaged, whether by runoff or other causes.
- D. Straw Bale Rows:
 1. Promptly replace bales that fall apart or otherwise deteriorate unless need has passed.
 2. Remove silt deposits that exceed one-half of the height of the bales.
 3. Repair bale rows that are undercut by runoff or otherwise damaged, whether by runoff or other causes.
- E. Clean out temporary sediment control structures weekly and relocate soil on site.
- F. Place sediment in appropriate locations on site; do not remove from site.

3.06 CLEAN UP

- A. Remove temporary measures after permanent measures have been installed, unless permitted to remain by Engineer.
- B. Clean out temporary sediment control structures that are to remain as permanent measures.
- C. Where removal of temporary measures would leave exposed soil, shape surface to an acceptable grade and finish to match adjacent ground surfaces.

END OF SECTION

**SECTION 01 7800
CLOSEOUT SUBMITTALS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Project record documents.
- B. Operation and maintenance data.
- C. Warranties and bonds.

1.02 SUBMITTALS

- A. Project Record Documents: Submit documents to Engineer with claim for final Application for Payment.
- B. Operation and Maintenance Data:
 - 1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Engineer will review draft and return one copy with comments.
 - 2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
 - 3. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Engineer comments. Revise content of all document sets as required prior to final submission.
 - 4. Submit two sets of revised final documents in final form within 10 days after final inspection.
- C. Warranties and Bonds:
 - 1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
 - 2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
 - 3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

- A. Maintain on site one set of the following record documents; record actual revisions to the Work:
 - 1. Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other modifications to the Contract.
 - 5. Reviewed shop drawings, product data, and samples.
 - 6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress.
- E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
 - 1. Manufacturer's name and product model and number.
 - 2. Product substitutions or alternates utilized.
 - 3. Changes made by Addenda and modifications.

- F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
 - 1. Measured depths of foundations in relation to finish first floor datum.
 - 2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - 3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - 4. Field changes of dimension and detail.
 - 5. Details not on original Contract drawings.

3.02 OPERATION AND MAINTENANCE DATA

- A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.
- B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.
- D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

- A. For Each Product, Applied Material, and Finish:
 - 1. Product data, with catalog number, size, composition, and color and texture designations.
 - 2. Information for re-ordering custom manufactured products.
- B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.
- C. Moisture protection and weather-exposed products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.
- D. Additional information as specified in individual product specification sections.
- E. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

- A. For Each Item of Equipment and Each System:
 - 1. Description of unit or system, and component parts.
 - 2. Identify function, normal operating characteristics, and limiting conditions.
 - 3. Include performance curves, with engineering data and tests.
 - 4. Complete nomenclature and model number of replaceable parts.
- B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.
- C. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.
- D. Include color coded wiring diagrams as installed.
- E. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions.

- Include summer, winter, and any special operating instructions.
- F. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- G. Provide servicing and lubrication schedule, and list of lubricants required.
- H. Include manufacturer's printed operation and maintenance instructions.
- I. Include sequence of operation by controls manufacturer.
- J. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- K. Provide control diagrams by controls manufacturer as installed.
- L. Provide Contractor's coordination drawings, with color coded piping diagrams as installed.
- M. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- N. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- O. Include test and balancing reports.
- P. Additional Requirements: As specified in individual product specification sections.

3.05 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

- A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.
- B. Where systems involve more than one specification section, provide separate tabbed divider for each system.
- C. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.
- D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
- E. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Engineer, Consultants, Contractor and subcontractors, with names of responsible parties.
- F. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.
- G. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.
- H. Text: Manufacturer's printed data, or typewritten data on 20 pound paper.
- I. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- J. Arrangement of Contents: Organize each volume in parts as follows:
 1. Project Directory.
 2. Table of Contents, of all volumes, and of this volume.
 3. Operation and Maintenance Data: Arranged by system, then by product category.
 - a. Source data.
 - b. Product data, shop drawings, and other submittals.
 - c. Operation and maintenance data.

- d. Field quality control data.
- e. Photocopies of warranties and bonds.
- 4. Design Data: To allow for addition of design data furnished by Engineer or others, provide a tab labeled "Design Data" and provide a binder large enough to allow for insertion of at least 20 pages of typed text.

3.06 WARRANTIES AND BONDS

- A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.
- B. Verify that documents are in proper form, contain full information, and are notarized.
- C. Co-execute submittals when required.
- D. Retain warranties and bonds until time specified for submittal.
- E. Include originals of each in operation and maintenance manuals, indexed separately on Table of Contents.
- F. Manual: Bind in commercial quality 8-1/2 by 11 inch three D side ring binders with durable plastic covers.
- G. Cover: Identify each binder with typed or printed title WARRANTIES AND BONDS, with title of Project; name, address and telephone number of Contractor and equipment supplier; and name of responsible company principal.
- H. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.
- I. Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

END OF SECTION

**SECTION 03 2000
CONCRETE REINFORCING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Reinforcing steel for cast-in-place concrete.
- B. Supports and accessories for steel reinforcement.

1.02 RELATED REQUIREMENTS

- A. Section 03 1000 - Concrete Forming and Accessories.
- B. Section 03 3000 - Cast-in-Place Concrete.

1.03 REFERENCE STANDARDS

- A. ACI MNL-66 - ACI Detailing Manual; 2020.
- B. ACI SPEC-301 - Specifications for Concrete Construction; 2020.
- C. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2022.
- D. ASTM A706/A706M - Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement; 2022a.
- E. ASTM A767/A767M - Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement; 2019.
- F. ASTM A775/A775M - Standard Specification for Epoxy-Coated Steel Reinforcing Bars; 2022.
- G. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2022.
- H. ASTM D3963/D3963M - Standard Specification for Fabrication and Jobsite Handling of Epoxy-Coated Steel Reinforcing Bars; 2021.
- I. AWS D1.4/D1.4M - Structural Welding Code - Steel Reinforcing Bars; 2018, with Amendment (2020).
- J. CRSI (DA4) - Manual of Standard Practice; 2018, with Errata (2019).

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Comply with requirements of ACI MNL-66 Include bar schedules, shapes of bent bars, spacing of bars, and location of splices.
 - 1. Prepare shop drawings under seal of a Professional Structural Engineer experienced in design of work of this type and licensed in Tennessee.
 - 2. Make shop drawings in accordance with Section 03 3000, paragraph 1.05, Shop drawings. No reproduction of Contract Drawings for use as shop drawings will be permitted.
- C. Reports: Submit certified copies of mill test report of reinforcement materials analysis.

1.05 QUALITY ASSURANCE

- A. Perform work of this section in accordance with ACI SPEC-301.
 - 1. Maintain one copy of each document on project site.
- B. Provide Engineer with access to fabrication plant to facilitate inspection of reinforcement. Provide notification of commencement and duration of shop fabrication in sufficient time to allow inspection.
- C. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.4/D1.4M and no more than 12 months before start of scheduled welding work.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver reinforcement to the job site bundled, tagged and marked. Use metal tags indicating bar size, lengths and other information corresponding to markings shown on placement diagrams.
- B. Storage: Store reinforcement at the job site in a manner to prevent damage and accumulation of dirt and excessive rust.

PART 2 PRODUCTS**2.01 REINFORCEMENT**

- A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi).
 - 1. Deformed billet-steel bars.
 - 2. Unfinished.
- B. Weldable Reinforcing Steel: ASTM A706/A706M, deformed low-alloy steel bars.
 - 1. Unfinished.
 - 2. Galvanized in accordance with ASTM A767/A767M, Class I.
 - 3. Epoxy coated in accordance with ASTM A775/A775M.
- C. Stirrup Steel: ASTM A1064/A1064M steel wire, unfinished.
- D. Steel Welded Wire Reinforcement (WWR): Galvanized, deformed type; ASTM A1064/A1064M.
 - 1. Form: Flat Sheets.
 - 2. WWR Style: 6 x 12-W12 x W5.
- E. Reinforcement Accessories: Bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcement in place:
 - 1. Use wire type bar supports or plastic chairs or supports complying with CRSI recommendations unless otherwise indicated. Do not use wood, brick or other unacceptable materials.
 - 2. For slabs on grade, use supports with sand plates or horizontal runners where base material will not support chair legs.
 - 3. For footings or other concrete that will be in direct contact with earth, provide supports with either hot-dipped galvanized, stainless steel, plastic protected steel legs, precast concrete bar supports, or supports made entirely of plastic or other acceptable, inert polymer. Do not use wood, brick or other unacceptable materials.
 - 4. Tie Wire: Annealed, minimum 16 gauge, 0.0508 inch.
 - 5. Provide stainless steel components for placement within 1-1/2 inches of weathering surfaces.

2.02 RE-BAR SPLICING:

- A. Coupler Systems: Mechanical devices for splicing reinforcing bars; capable of developing full steel reinforcing design strength in tension and compression.
 - 1. Products:
 - a. Dayton Superior Corporation: www.daytonsuperior.com.
 - b. Approved equal.
- B. Dowel Bar Splicer with Dowel-Ins: Mechanical devices for splicing reinforcing bars.
 - 1. Products:
 - a. Dayton Superior Corporation: www.daytonsuperior.com.
 - b. Approved equal.
- C. Taper Tie Hole Plug: Mechanical device for plugging tie holes; anchors optional flush or recessed grout.
 - 1. Products:
 - a. Dayton Superior Corporation; A58 Sure Plug: www.daytonsuperior.com/#sle.

- b. Approved equal.

2.03 FABRICATION

- A. Fabricate concrete reinforcing in accordance with CRSI (DA4) - Manual of Standard Practice.
- B. Welding of reinforcement is permitted only with the specific approval of Engineer. Perform welding in accordance with AWS D1.4/D1.4M.
- C. Fabricate and handle epoxy-coated reinforcing in accordance with ASTM D3963/D3963M.
- D. Locate reinforcing splices not indicated on drawings at point of minimum stress.
 - 1. Review locations of splices with Engineer.
- E. General: Fabricate reinforcing bars to conform to required shapes and dimensions, with fabrication tolerances complying with ACI Manual. In case of fabricating errors, do not rebend or straighten reinforcement in a manner that will injure or weaken the material. If clearances for reinforcing require hooks shorter than standard hooks, fabricator shall be responsible for providing shorter hooks, as required.
- F. Unacceptable materials: Reinforcement with any of the following defects will not be permitted in the Work:
 - 1. Bar lengths, depths and bends exceeding specified fabrication tolerances.
 - 2. Bends or kinks not indicated on Drawings or Final Shop Drawings.
 - 3. Bars with reduced cross-section due to excessive rusting or other cause.

PART 3 EXECUTION

3.01 PLACEMENT

- A. Place, support and secure reinforcement against displacement. Do not deviate from required position.
- B. Do not displace or damage vapor barrier.
- C. Accommodate placement of formed openings.
- D. Place reinforcement as follows with the following clear cover, unless noted otherwise on drawings:
 - 1. Below Grade
 - a. Unformed 3"
 - b. Formed 2"
 - 2. Walls 2"
- E. Comply with applicable code for concrete cover over reinforcement.
- F. Bond and ground all reinforcement 26 0526.

3.02 INSPECTION

- A. Examine the substrate, formwork, and the conditions under which concrete reinforcement is to be placed, and correct conditions which would prevent proper and timely completion of the Work. Do not proceed with the work until unsatisfactory conditions have been corrected.
- B. Inspection: Before placement of concrete, a representative of the Owner shall observe the placement of all reinforcing and give his approval.

3.03 FIELD QUALITY CONTROL

- A. An independent testing agency, as specified in Section 01 4000 - Quality Requirements, will inspect installed reinforcement for compliance with contract documents before concrete placement.

3.04 INSTALLATION

- A. General:

1. Standards for details and methods of reinforcement placement and supports shall be in accordance with ACI requirements, CRSI Recommended Practices for Placing Reinforcing Bars, and as herein specified.
 2. Clean reinforcement to remove loose rust and mill scale, earth, and other materials which reduce or destroy bond with concrete.
 3. Position, support, and secure reinforcement and embedments against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcing by metal or plastic chairs, runners, bolsters, spacers, and hangers, as required and recommended by CRSI.
 4. Place reinforcement to obtain the minimum coverages for concrete protection. Arrange, space and securely tie bars and bar supports together with 16 gauge wire to hold reinforcement accurately in position during concrete placement operations. Set wire ties so that twisted ends are directed away from exposed concrete surfaces.
 5. Install welded wire reinforcement in as long lengths as practicable. Lap adjoining pieces minimum of 8 inches. Welded wire fabric shall be continuously supported at 36" on center (O.C.) maximum.
 6. Provide sufficient numbers of supports and of strength to carry reinforcement. Do not place reinforcing bars more than 2" beyond the last leg of any continuous bar support. Do not use supports as bases for runways for concrete conveying equipment and similar construction loads.
 7. All vertical reinforcing shall be doweled to footings or the structure below. Dowels shall be the same size and at the same spacing as the vertical reinforcing scheduled or detailed for the element above, unless otherwise indicated on the plans.
 8. Dowels extending into footings shall terminate with a 90° standard ACI hook and shall extend to within 4-inches of the bottom of the footing.
 9. All embedments and dowels shall be securely tied to formwork or the adjacent reinforcing prior to the placement of concrete.
- B. Splices: Provide standard reinforcement splices by lapping ends, placing bars in contact, and tightly tying wire. Reinforcement shall be spliced only as shown or noted in the plans or specifications. Splices at other locations may be used only when approved in writing by the structural engineer.
1. Horizontal wall reinforcing shall terminate at ends of walls and openings into the far end of the jamb column with a 90-degree hook plus a 6 bar diameter extension, unless otherwise shown on the Plans.
 2. Lap horizontal bars as noted above or as shown on the Plans. Horizontal wall reinforcing shall be continuous through construction and control joints. Splices in horizontal reinforcement shall be staggered so that the splice laps do not occur along a single line. Splices in two curtains of reinforcing, where used, shall not occur in the same location. Splice laps shall not overlap other splices.
 3. Mechanical bar splices capable to develop at least 125 percent of the specified yield strength of the bar(s) may be used in lieu of contact lap splices where approved by the Architect/Engineer. Unless specifically noted otherwise, the connectors shall meet most restrictive of the requirements for a Type 2 as defined by ACI 318 Sections 21.2.6 or ICC Elevation Service AC 133. A submittal for the bar splices is required.
 4. Welding: Reinforcing bars shall not be welded unless specifically indicated on the plans.
- C. Detailing:
1. Unless specific additional reinforcement around wall openings is shown on the drawings, provide additional reinforcing steel as follows:
 - a. Walls with single layer of reinforcing steel located in center of wall:
 - 1) Provide additional reinforcing steel on each side of the opening equivalent to one half of the cross-sectional area of the reinforcing steel interrupted by the opening, or a minimum of 2-#5 bars. The bars shall have sufficient length to

- develop bond at each end beyond the opening or penetration.
- 2) Provide diagonal reinforcing steel, 2-#5 x 4'-0" centered on the corners of the opening. Locate one #5 bar on either face of the center reinforcing steel.
- b. Walls with single layer of reinforcing steel located on one face of wall:
- 1) Provide additional reinforcing steel on one side of the opening equivalent to one half of the cross-sectional area of the reinforcing steel interrupted by the opening, or a minimum of 2-#5 bars. These additional reinforcing bars to be in same plane as the interrupted reinforcing steel. The bars shall have sufficient length to develop bond at each end beyond the opening or penetration.
 - 2) Provide additional reinforcing steel on the other (unreinforced) side of the wall of 2-#5 horizontal or vertical at each edge of the opening. Extend 2 feet beyond the opening.
 - 3) Provide diagonal reinforcing steel, add 2-#5 x 4'-0" centered on the corners of the opening. Locate one bar in each face to each of the other layers of interior reinforcing.
- c. Walls with reinforcing steel located in both faces of the wall:
- 1) Provide additional reinforcing steel on each side of the opening equivalent to one half of the cross-sectional area of the reinforcing steel interrupted by the opening for that particular face, or a minimum of 2-#5 bars in each face horizontal and vertical. The bars shall have sufficient length to develop bond at each end beyond the opening or penetration.
 - 2) Provide diagonal reinforcing steel, add 4-#5 x 4'-0" centered on the corners of the opening. Locate 2-#5 in each face interior to each of the other layers of reinforcing.
- d. All recesses in concrete walls that interrupt the reinforcing steel shall be reinforced as if the recess were an opening.
2. All openings in slabs that are not shown on the structural Plans must be approved by the engineer, in writing.
 3. Embedded pipes, ducts, or conduits: The maximum diameter for embedded pipes, ducts, or conduits shall be 1/3 of the slab or wall thickness, spaced at a minimum of 3 conduit diameters on center.

END OF SECTION

**SECTION 03 3000
CAST-IN-PLACE CONCRETE**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Slabs on grade.
- B. Concrete walls
- C. Joint devices associated with concrete work.
- D. Miscellaneous concrete elements, including equipment pads, equipment pits, light pole bases, flagpole bases, thrust blocks, and manholes.
- E. Concrete curing.

1.02 RELATED REQUIREMENTS

- A. Section 03 1000 - Concrete Forming and Accessories: Forms and accessories for formwork.
- B. Section 03 2000 - Concrete Reinforcing.
- C. Section 07 9200 - Joint Sealants: Products and installation for sealants and joint fillers for saw cut joints and isolation joints in slabs.

1.03 REFERENCE STANDARDS

- A. ACI 211.2 - Standard Practice for Selecting Proportions for Structural Lightweight Concrete; 1998 (Reapproved 2004).
- B. ACI CODE-318 - Building Code Requirements for Structural Concrete and Commentary; 2019 (Reapproved 2022).
- C. ACI PRC-211.1 - Selecting Proportions for Normal-Density and High Density-Concrete - Guide; 2022.
- D. ACI PRC-302.1 - Guide to Concrete Floor and Slab Construction; 2015.
- E. ACI PRC-304 - Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000 (Reapproved 2009).
- F. ACI PRC-305 - Guide to Hot Weather Concreting; 2020.
- G. ACI PRC-306 - Guide to Cold Weather Concreting; 2016.
- H. ACI PRC-308 - Guide to External Curing of Concrete; 2016.
- I. ACI PRC-347 - Guide to Formwork for Concrete; 2014 (Reapproved 2021).
- J. ACI SPEC-117 - Specification for Tolerances for Concrete Construction and Materials; 2010 (Reapproved 2015).
- K. ACI SPEC-301 - Specifications for Concrete Construction; 2020.
- L. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2023.
- M. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2023.
- N. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2023.
- O. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50 mm] Cube Specimens); 2021.
- P. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2020.
- Q. ASTM C150/C150M - Standard Specification for Portland Cement; 2022.
- R. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete; 2020.

- S. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2010a (Reapproved 2016).
- T. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2019, with Editorial Revision (2022).
- U. ASTM C881/C881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete; 2020a.
- V. ASTM C1059/C1059M - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete; 2021.
- W. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2020.
- X. ASTM C1315 - Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete; 2019.
- Y. ASTM D994/D994M - Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type); 2011 (Reapproved 2022).
- Z. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Asphalt Types); 2023.
- AA. ASTM D1752 - Standard Specification for Preformed Sponge Rubber, Cork, and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction; 2018 (Reapproved 2023).
- BB. ASTM D2103 - Standard Specification for Polyethylene Film; 2023a.
- CC. ASTM E1643 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs; 2018a.
- DD. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2017 (Reapproved 2023).

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Shop Drawings: The Contractor is to include as a part of his expense the cost of completely dimensioned concrete shop drawings embracing plans and details, bending diagrams, steel order list, placing diagrams, which service shall be furnished by a structural engineer licensed in the State of the project. No portion of the contract documents shall be reproduced and submitted as shop drawings. The shop drawings shall include the following:
 - 1. Wall Elevations - fully dimensioned showing all thicknesses, reinforcing sections, form joints and all items that will leave visible marks or interruptions in the finished surfaces.
 - 2. Necessary Floor Plans - fully dimensioned plans with all depressions, rises, reinforcing steel, to include placement and accessories.
 - 3. Miscellaneous Items - All other reinforced concrete items shall be drawn at such scale as to give full dimensions, details and reinforcing with accessories as required.
- C. All reinforcing shall be detailed, ordered, fabricated in accordance with the latest ACI Manual of Standard Practice for Detailing Concrete Structures and the CRSI Manual of Standard Practice.
- D. Submit Shop Drawings to the Architect/Engineer for review, prior to release to field. Fabrication of reinforcing steel shall not be started until Drawings have been reviewed and stamped.
- E. Prior to the placement of any concrete, design mixes for each type of concrete shall be submitted and approved by the testing laboratory. Mix designs shall include all required and shall include each type of aggregate and admixture to be used.
- F. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.

1. For curing compounds, provide data on method of removal in the event of incompatibility with floor covering adhesives.
- G. Mix Design: Submit proposed concrete mix design.
 1. Indicate proposed mix design complies with requirements of ACI SPEC-301, Section 4 - Concrete Mixtures.
 2. Indicate proposed mix design complies with requirements of ACI CODE-318, Chapter 5 - Concrete Quality, Mixing and Placing.
- H. Samples: Submit samples of underslab vapor retarder to be used.
- I. Samples: Submit two, 12 inch long samples of waterstops and construction joint devices.
- J. Test Reports: Submit report for each test or series of tests specified.
- K. Manufacturer's Installation Instructions: For concrete accessories, indicate installation procedures and interface required with adjacent construction.
- L. Sustainable Design Submittals: If any wood or wood-based form materials, including supports, are permanently installed in the project, submit documentation required for sustainably harvested wood.
- M. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.
- N. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

- A. Perform work of this section in accordance with ACI SPEC-301 and ACI CODE-318.
- B. Follow recommendations of ACI PRC-306 when concreting during cold weather.

PART 2 PRODUCTS

2.01 FORMWORK

- A. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.
 1. Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.

2.02 REINFORCEMENT MATERIALS

2.03 CONCRETE MATERIALS

- A. Cement: ASTM C150/C150M, Type I - Normal Portland type.
 1. Acquire cement for entire project from same source.
- B. Fine and Course Aggregates shall conform to the following specifications:
 1. Coarse and fine aggregate shall conform to requirements of ASTM C33/C33M.
 2. All coarse aggregates shall be crushed limestone.
 3. The maximum size of coarse aggregate shall not be larger than 1", 1/5 of the narrowest dimension between forms of the member for which the concrete is to be used, nor larger than 3/4 the minimum clear spacing between reinforcing bars. Coarse aggregate for all concrete exposed to the weather shall be crushed limestone with a #57 gradation.
 4. Absorption in coarse aggregate shall not exceed 5%.
 5. The fineness modulus for fine aggregate used shall not vary more than 0.2 from the approved sample without approval. Fineness modulus to be 2.9.
 6. Each type of aggregate shall be from the same source for the entire project.
- C. All concrete shall be normal weight unless specifically noted otherwise.
 1. Normal weight concrete shall be approximately 145 to 155 pounds per cubic foot.

- D. Water shall be clean, fresh, and free from injurious amounts of oils, acids, alkali or organic material or other substances that may be deleterious to concrete or steel. ASTM C94 (potable).
- E. Non-shrink grout shall be factory pre-mixed non-shrink, non-metallic grout containing mineral aggregate and shall require only the addition of water at the site. Grout shall be "EUCO NS" (non-metallic) as manufactured by the Euclid Chemical Company, "Masterflow 713" (non-metallic) as manufactured by Master Builders or approved equal. The grout shall conform to ASTM C-1107.
- F. Waterstops shall be Synko-Flex Non-Swelling Preformed Waterstop, Model No. SF302, , at locations shown on drawings.
- G. All materials shall be subject to approval. Any change of materials specified shall be submitted for approval and such change, if acceptable, shall be used only when specifically authorized in writing.
- H. Fine and Coarse Aggregates: ASTM C33/C33M.

2.04 ADMIXTURES

- A. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.
- B. Air Entrainment Admixture: ASTM C260/C260M.
- C. Water Reducing Agent: ASTM C494 Type A.
- D. High Range Water Reducing Admixture: ASTM C494/C494M Type F.
- E. Water Reducing Admixture: ASTM C494/C494M Type A.

2.05 ACCESSORY MATERIALS

- A. Underslab Vapor Retarder: Sheet material complying with ASTM E1745, Class A; stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs. The use of single ply polyethylene is prohibited.
 - 1. Sheet Material: ASTM E1745, Class A; stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs. Single-ply polyethylene is prohibited.
 - 2. Installation: Comply with ASTM E1643.
 - 3. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations.
 - 4. Products:
 - a. ISI Building Products; Viper VaporCheck II 15-mil (Class A): www.isibp.com/#sle.
 - b. Stego Industries, LLC: www.stegoindustries.com/#sle.
 - c. W. R. Meadows, Inc; PERMINATOR Class A - 10 mils (0.25 mm): www.wrmeadows.com/#sle.
 - d. Approved equal.
- B. Non-Shrink Cementitious Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
 - 1. Grout: Comply with ASTM C1107/C1107M.
 - 2. Minimum Compressive Strength at 48 Hours, ASTM C109/C109M: 2,000 pounds per square inch.
 - 3. Minimum Compressive Strength at 28 Days, ASTM C109/C109M: 7,000 pounds per square inch.

2.06 BONDING AND JOINTING PRODUCTS

- A. Latex Bonding Agent: Non-redispersable acrylic latex, complying with ASTM C1059/C1059M, Type II.
- B. Epoxy Bonding System:

1. Complying with ASTM C881/C881M and of Type required for specific application.
- C. Slab Isolation Joint Filler: 1/2-inch thick, height equal to slab thickness, with removable top section forming 1/2-inch deep sealant pocket after removal.
 1. Material: ASTM D1751, cellulose fiber.
 2. Material: ASTM D1752, sponge rubber (Type I).
 3. Material: Closed-cell, non-absorbent, compressible polymer foam in sheet form.
- D. Slab Construction Joint Devices: Combination keyed joint form and screed, galvanized steel, with rectangular or round knockout holes for conduit or rebar to pass through joint form at 6 inches on center; ribbed steel stakes for setting.

2.07 CURING MATERIALS, SEALING MATERIALS, AND HARDENING COMPOUND

- A. Moisture-Retaining Sheet: ASTM C171.
 1. Curing paper, regular.
 2. Polyethylene film, white opaque, minimum nominal thickness of 4 mil, 0.004 inch.
 3. White-burlap-polyethylene sheet, weighing not less than 3.8 ounces per square yard.
- B. Water: Potable, not detrimental to concrete.
- C. Curing Compounds: Comply with ASTM C309, Type 1, Class A. If concrete contains flyash, comply with ASTM C1315.
 1. Non-yellowing formulation where subject to ultra violet light
 2. The compound shall be a dissipating resin type compound. The film must chemically break down in a two to four week period after application.
- D. Curing and Sealing Compound: Comply with ASTM C309, Type 1, Class A. If concrete contains flyash, comply with ASTM C1315. Where indicated, provide curing and sealing formulation with long-lasting finish that is resistant to chemicals, oil, grease, deicing salts, and abrasion.
 1. Non-yellowing formulation where subject to ultra violet light
- E. The curing compound shall have test data from an independent laboratory indicating a maximum moisture loss of 0.030 grams per square cm when applied at a coverage rate of 300 square feet per gallon. Manufacturer's certification is required.
- F. Curing compounds shall not be used on any surface against which additional concrete or other cementitious materials are to be bonded.
- G. All curing compound shall be delivered to the site of the work in the original container bearing the name of the manufacturer and the brand name. The compound shall be stored in a manner that prevents damage to the container and protects water-emulsion types from freezing.
- H. Contractor must verify that curing compound used is appropriate for the specified floor finish and compatible with materials used in the final application.

2.08 CONCRETE MIX DESIGN

- A. Proportioning Normal Weight Concrete: Comply with ACI PRC-211.1 recommendations and with the following requirements:.

Compressive Strength, psi	Coarse Aggregate (Type Size)	Cement Content (lbs/cy Min)	Slump Max.	Water-Cement Ratio Max. by Wt. (Non-Air Air Entrained)
4,000	Limestone 5/8"	588	3"	.44

- B. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI SPEC-301.

1. For trial mixtures method, employ independent testing agency acceptable to Engineer for preparing and reporting proposed mix designs.
- C.
- D. Admixtures: Add acceptable admixtures as recommended in ACI PRC-211.1 and at rates recommended or required by manufacturer.
- E. Fly Ash: Add fly ash to concrete mixes as indicated on the design drawings. Fly ash may be used as a partial replacement for Portland Cement consistent with ACI recommendations. Limit maximum fly ash content as part of total cementitious materials as indicated on the design drawings.
- F. Concrete Types: Refer to design drawings for locations requiring concrete mix design types including compressive strength and aggregate type with options for fly ash and air entrainment.
- G. Strengths: Unless otherwise indicated on the drawings or in the specifications, strengths shall be 4,000 psi minimum 28 day compressive strength.

2.09 MIXING

- A. It shall be the Contractor's responsibility to furnish concrete which will conform to the quality and strength specified.
- B. Transit Mixers: Comply with ASTM C94/C94M.
- C. Adding Water: If concrete arrives on-site with slump less than suitable for placement, do not add water that exceeds the maximum water-cement ratio or exceeds the maximum permissible slump.
- D. Admixtures:
 1. Calcium Chloride shall not be used.
 2. An approved air entraining agent (ASTM C260) shall be added at the mixer with accurate dispenser to produce entrained air 4-6% by volume in all concrete subject to weathering conditions.
 3. An approved water-reducing agent equal to those manufactured by Master Builder's Inc., applied at the mixer with an accurate dispenser (ASTM 494 Type A).
 4. These and other admixtures shall be used only with specific approval. Tests for design mixes shall be made with the admixtures included.
- E. The concrete shall be of such consistency and composition that it can be worked readily into the corners and angles of the forms and around reinforcement without permitting materials to segregate or free water to collect on the surfaces. Within the limiting requirements the Contractor shall adjust the consistency of the concrete as may be necessary to produce mixtures which will be placeable with reasonable methods of placing and compacting. The Contractor shall maintain on the job at all times adequate extra cement to be used at the rate of 1/2 sack cement per cubic yard concrete for each 2" slump increase for corrections due to wetness desired or obtained. No water shall be added to concrete except under the direct supervision of the Architect/Engineer or his appointed representative. Under no circumstances will the addition of more than 2 gallons of water per cubic yard of concrete be allowed at the site.
- F. Measurement of Materials:
 1. Cement shall be measured by the sack or half-sack unless cement is weighed for each batch.
 2. Aggregates shall be proportioned separately by weight with proper compensation for weight of moisture; weighing equipment shall be accurate within 1%.
 3. Water shall be measured by an approved device capable of accurate measurement to one pint.
- G. Concrete shall be from a single source for each major pour.

2.10 EXPANSION MATERIALS

- A. Verify compatibility of joint filler with sealant specified.
- B. All expansion joints on grade shall be pre-formed non-extruding resilient type, bituminous or bonded cork (ASTM D994/D994M or ASTM D1751).
- C. Other expansion joints may comply with ASTM D1752 - "Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction."
- D. Manufacturer's certification and material submittal are required.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to the proper and timely completion of the Work. Do not proceed until unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Formwork: Comply with requirements of ACI SPEC-301. Design and fabricate forms to support all applied loads until concrete is cured and for easy removal without damage to concrete.
- B. Verify that forms are clean and free of rust before applying release agent.
- C. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.
- D. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning and applying bonding agent in according to bonding agent manufacturer's instructions.
 - 1. Use epoxy bonding system for bonding to damp surfaces, for structural load-bearing applications, and where curing under humid conditions is required.
 - 2. Use latex bonding agent only for non-load-bearing applications.
- E. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.
- F. Slabs on Grade: Install vapor retarder under interior slabs on grade. Comply with ASTM E1643. Lap joints minimum 6 inches. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions. Repair damaged vapor retarder before covering.
 - 1. Granular Fill Over Vapor Retarder: Cover vapor retarder with compactible granular fill as indicated on drawings. Do not use sand.
 - 2. Vapor Retarder Over Granular Fill: Install compactible granular fill before placing vapor retarder as indicated on drawings. Do not use sand.
- G. Concrete placing shall not be started until all necessary preparations have been completed and approval has been given. Preparations shall consist of completing all form work involved, placing all reinforcing steel, pipes, conduits, sleeves, hangers, anchors, fastening devices, waterproofing and such other work to be built into the concrete in the section to be poured, and any other preparations herein required for the concreting operations. Free water and any mud or debris shall be removed from forms and excavations to be occupied by concrete. Approved equipment shall be available on the job site for heating and/or protecting the concrete whenever freezing temperatures are likely to occur within curing period. Ice or chilled water may be required to control concrete temperature in hot weather to below 90 degrees F.
- H. Slabs-on-grade shall be placed on a properly leveled and thoroughly compacted subgrade, equal to 95% maximum dry density. All subsoils for slabs shall be approved before placing concrete.
- I. Approved equipment shall be provided for heating concrete materials and/or protecting the concrete whenever freezing temperatures are likely to occur within curing period.

3.03 INSTALLING REINFORCEMENT AND OTHER EMBEDDED ITEMS

- A. Comply with requirements of ACI SPEC-301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.
- B. Install welded wire reinforcement in maximum possible lengths, and offset end laps in both directions. Splice laps with tie wire.
- C. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with concrete placement.

3.04 PLACING CONCRETE

- A. Place concrete in accordance with ACI PRC-304.
- B. Place concrete for floor slabs in accordance with ACI PRC-302.1.
- C. Notify Engineer not less than 24 hours prior to commencement of placement operations.
- D. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- E. Ensure reinforcement, inserts, waterstops, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.
- F. Concrete shall be conveyed from the mixer or transporting vehicle to the place of final deposit as rapidly as practicable by methods which will prevent segregation or loss of materials or displacement of the reinforcing steel and which will avoid rehandling. For ready-mix concrete in an agitator truck, the elapsed time from mixer to placement shall not exceed 1-1/2 hours.
- G. Concrete shall be deposited as nearly as practicable in its final position and shall have the qualities required. Concrete shall be deposited continuously in layers or section of such thickness that no concrete will be deposited on concrete which has hardened sufficiently to cause seams or planes of weakness. If sections cannot be placed continuously, proper construction joints shall be provided.
- H. Concrete during and immediately after depositing shall be thoroughly compacted and worked around reinforcing and embedded fixtures and into all parts of forms by means of spades, rods and approved mechanical vibrators.

For thin walls or inaccessible portions, concrete shall be worked into place by vibrating or other approved method: Care shall be taken so as not to work the concrete to the point where segregation occurs.
- I. Place concrete continuously without construction (cold) joints wherever possible; where construction joints are necessary, before next placement prepare joint surface by removing laitance and exposing the sand and sound surface mortar, by sandblasting or high-pressure water jetting.
- J. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.

3.05 SLAB JOINTING

- A. Locate joints as indicated on drawings.
- B. Anchor joint fillers and devices to prevent movement during concrete placement.
- C. Isolation Joints: Use preformed joint filler with removable top section for joint sealant, total height equal to thickness of slab, set flush with top of slab.
 - 1. Install wherever necessary to separate slab from other building members, including columns, walls, equipment foundations, footings, stairs, manholes, sumps, and drains.
- D. Load Transfer Construction and Contraction Joints: Install load transfer devices as indicated; saw cut joint at surface as indicated for contraction joints.
- E. Provide reinforcing dowels to match the reinforcing at the joint, unless noted otherwise.

- F. Provide reinforcing dowels to match the reinforcing at the joint, unless noted otherwise.
- G. Saw Cut Contraction Joints: Saw cut joints before concrete begins to cool, within 4 to 12 hours after placing; use 3/16 inch thick blade and cut at least 1 inch deep but not less than one quarter (1/4) the depth of the slab.
- H. Construction Joints: Where not otherwise indicated, use metal combination screed and key form, with removable top section for joint sealant.

3.06 CONCRETE FINISHING

A. Finishing of Formed Surfaces

1. Rough Form Finish: For formed concrete surfaces not exposed-to-view in the finish work or by other construction, unless otherwise indicated. This is the concrete surface having texture imparted by form facing material used, with tie holes and defective areas repaired and patched and fins and other projections exceeding 1/4" in height rubbed down or chipped off.
2. Smooth Form Finish: For formed concrete surfaces exposed-to-view, or surfaces that are covered with a coating material applied directly to concrete, or a covering material applied directly to concrete, such as waterproofing, dampproofing, painting or other similar system. This is as-cast concrete surface obtained with selected form facing material, arranged orderly and symmetrically with a minimum of seams. Repair and patch defective areas with fins or other projections completely removed and smoothed.
3. Smooth Rubbed Finish: Provide smooth rubbed finish to scheduled concrete surfaces, which have received smooth form finish treatment, not later than one day after form removal. Moisten concrete surfaces and rub with carborundum brick or other abrasive until a uniform color and texture is produced. Do not apply cement grout other than that created by the rubbing process.
4. Rubbed Grout Finish: Provide rubbed grout finish to scheduled concrete surfaces as follows:
 - a. Mix one (1) part Portland cement to one and one-half (1 1/2) parts of fine sand with enough water to produce a mixture with the consistency of thick paint.
 - b. Wet the surface sufficiently to prevent the absorption of water from the mixture.
 - c. Apply the mixture uniformly to the surface with spray or brush so that the applied thickness does not exceed 1/8 of an inch.
 - d. Immediately after application of the mixture, vigorously scrub the surface with a cork float or stone in order to coat the surface and work the mixture into holes, air pockets, honey-combs and other voids.
 - e. While the mixture is still plastic, remove any excess grout by working the surface with a rubber float or other suitable device.
 - f. After the surface whites from drying, rub vigorously with clean burlap.
 - g. Maintain the finish coat is a moist condition for at least thirty-six (36) hours after final rubbing.
5. Related Unformed Surfaces: At tops of walls, horizontal offset surfaces occurring adjacent to formed surfaces, strike-off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

B. Slab Finishes

1. Scratch Finish: Apply scratch finish to monolithic slab surfaces that are to receive concrete floor topping or mortar setting beds for tile, terrazzo, stone and other bonded applied cementitious finish flooring material, and as otherwise indicated. After placing slabs, plane surface to a tolerance not exceeding 1/2" in 10' when tested with a 10' straightedge. Slope surfaces uniformly to drains where required. After leveling; roughen surface before final set, with stiff brushes, brooms or rakes.

2. Float Finish: Apply float finish, or wood float finish as described in ACI 302.1R, to monolithic slab surfaces to receive trowel finish and other finishes as hereinafter specified, and slab surfaces which are to be covered with membrane or elastic waterproofing, membrane or elastic roofing, and as otherwise indicated. After screening, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating when surface water has disappeared or when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Consolidate surface with power-driven floats, or by hand-floating if area is small or inaccessible to power units. Check and level surface plane to a tolerance not exceeding 1/4" in 10' when tested with a 10' straightedge. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture.
3. Trowel Finish: Apply trowel finish, or steel trowel finish as described in ACI 302.1R, to monolithic slab surfaces to be exposed-to-view, and slab surfaces to be covered with resilient flooring, paint or other thin film finish coating system. After floating, begin final trowel finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance, and with a trowel marks, uniform in texture and appearance, and with a surface plane tolerance not exceeding 1/8" in 10' when tested with a 10' straightedge. Grind smooth surface defects which would telegraph through applied floor covering system.
4. Non-Slip Broom Finish: Apply non-slip broom finish to exterior concrete platforms, steps and ramps, and elsewhere as indicated. Immediately after trowel finishing, slightly roughen concrete surface by brooming with fiber bristle broom perpendicular to main traffic route. Architect/Engineer Contracting Officer See Section 32 1313 - Concrete Paving. Provide a light, medium or coarse texture as directed on the drawings, defined as follows:
 - a. Light Broom Finish: The texture imparted to the surface by simply dragging the broom across the concrete without the application of any weight or downward pressure.
 - b. Medium Broom Finish: The texture imparted to the surface by dragging the broom across the concrete while applying enough downward pressure to create striations that are approximately 1/8 of an inch deep.
 - c. Coarse Broom Finish: The texture imparted to the surface by dragging a weighted broom across the concrete or while applying enough downward pressure to create striations that are approximately 1/4 of an inch deep.
5. Chemical-Hardener Finish: Apply chemical-hardener finish to interior concrete floors where indicated. Apply liquid chemical-hardener after complete curing and drying of the concrete surface. Dilute liquid hardener with water, and apply in 3 coats; first coat, 1/3-strength; second coat, 1/2-strength; third coat, 2/3-strength. Evenly apply each coat, and allow 24 hours for drying between coats. Apply proprietary chemical hardeners, in accordance with manufacturer's printed instructions. After final coat of chemical-hardener solution is applied and dried, remove surplus hardener by scrubbing and mopping with water.

3.07 CURING AND PROTECTION

- A. Comply with requirements of ACI PRC-308. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Formed Surfaces: Cure by moist curing with forms in place for full curing period.
- C. Curing Slabs and Surfaces Not in Contact with Forms:
 1. Initial Curing: Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 7 day and then begin final curing.
 2. Final Curing: Begin final curing procedures immediately following initial curing and before concrete has dried. Continue final curing for at least 7 days in accordance with ACI 301

procedures. Avoid rapid drying at end of final curing period.

- D. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than seven days by water ponding, water-saturated sand, water-fog spray, or saturated burlap.
 - 1. Ponding: Maintain 100 percent coverage of water over floor slab areas, continuously for 4 days.
 - 2. Spraying: Spray water over floor slab areas and maintain wet.
 - 3. Saturated Burlap: Saturate burlap-polyethylene and place burlap-side down over floor slab areas, lapping ends and sides; maintain in place.
- E. Final Curing: Begin after initial curing but before surface is dry.
 - 1. Moisture-Retaining Sheet: Lap strips not less than 3 inches (75 mm) and seal with waterproof tape or adhesive; secure at edges. Maintain Moisture-Retaining Sheet for a period of 7 days.
 - 2. Curing Compound: Apply in two coats at right angles, using application rate recommended by manufacturer as soon as final finishing operations are complete (within 2 hours).
- F. Curing Methods: Perform curing of concrete by moist curing, by moisture-retaining sheet curings, by curing compound, and by combinations thereof, as herein specified.
- G. Do not use membrane curing compounds on surfaces which are to be covered with coating material applied directly to concrete, liquid floor hardener, waterproofing, dampproofing, membrane roofing, flooring, painting, and other coatings and finish materials, unless otherwise acceptable to Architect/Engineer. Final cure these concrete surfaces by use of moisture-retaining sheet, unless otherwise directed.

3.08 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.
- B. Provide free access to concrete operations at project site and cooperate with appointed firm.
- C. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.
- D. Tests of concrete and concrete materials may be performed at any time to ensure compliance with specified requirements.
- E. Compressive Strength Tests: ASTM C39/C39M, for each test, mold and cure three concrete test cylinders. Obtain test samples for every 100 cubic yards or less of each class of concrete placed.
- F. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.
- G. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C143/C143M.

3.09 DEFECTIVE CONCRETE

- A. Test Results: The testing agency shall report test results in writing to Engineer and Contractor within 24 hours of test.
- B. Defective Concrete: Concrete not complying with required lines, details, dimensions, tolerances or specified requirements.
- C. Repair or replacement of defective concrete will be determined by the Engineer. The cost of additional testing shall be borne by Contractor when defective concrete is identified.
- D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Engineer for each individual area.

- E. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removal of forms, when acceptable to Architect/Engineer. Cut out honeycomb, rock pockets, voids over 1/4" in any dimension, and holes left by tie rods and bolts, down to solid concrete but, in no case to a depth of less than 1". Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water and brush-coat the area to be patched with specified bonding agent. Place patching mortar after bonding compound has dried.
- F. For exposed-to-view surfaces, blend white portland cement and standard portland cement so that, when dry, patching mortar will match color surrounding. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.
- G. Repair of Formed Surfaces: Remove and replace concrete having defective surface if defects cannot be repaired to satisfaction of Architect/Engineer. Surface defects, as such, include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets; fins and other projections on surface; and stains and other discolorations that cannot be removed by cleaning. Flush out form tie holes, fill with dry pack mortar, or precast cement cone plugs secured in place with bonding agent.
- H. Repair concealed formed surfaces, where possible, that contain defects that affect the durability of concrete. If defects cannot be repaired, remove and replace concrete.
- I. Repair of Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface plane to tolerances specified for each surface and finish. Correct low and high areas as herein specified. Test unformed surfaces sloped to drain for trueness of slope, in addition to smoothness, using a template having required slope.
- J. Correct high areas in unformed surfaces by grinding, after concrete has cured at least 14 days.
- K. Correct low areas in unformed surfaces during, or immediately after completion of surface finishing operations by cutting out low areas and replacing with fresh concrete. Finish repaired areas to blend into adjacent concrete. Proprietary patching compounds may be used when acceptable to Architect/Engineer.
- L. Repair defective areas, except random cracks and single holes not exceeding 1" diameter, by cutting out and replacing with fresh concrete. Remove defective areas to sound concrete with clean, square cuts and expose reinforcing steel with at least 3/4" clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding compound. Mix patching concrete of same material to provide concrete of same type or class as original concrete. Place, compact and finish to blend with adjacent finish concrete. Cure in same manner as adjacent concrete.
- M. Repair isolated random cracks and single holes not over 1" in diameter by dry-pack method. Groove top of cracks and cut-out holes to sound concrete and clean of dust, dirt and loose particles. Dampen cleaned concrete surfaces and apply bonding compound. Mix dry-pack, consisting of one part portland cement to 2-1/2 parts fine aggregate passing a No. 16 mesh sieve, using only enough water as required for handling and placing. Place dry pack after bonding compound has dried. Compact-dry-pack mixture in place and finish to match adjacent concrete. Keep patched area continuously moist for not less than 72 hours. Use epoxy-based mortar for structural repairs, where directed by the testing laboratory.
- N. Repair methods not specified above may be used, subject to acceptance of Architect/Engineer.

END OF SECTION

**SECTION 05 1200
STRUCTURAL STEEL FRAMING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Structural steel framing members.
- B. Work shall include but not be limited to:
 - 1. Beams
 - 2. Cap plates
 - 3. Connections, field and shop welded and bolted
 - 4. Bracing
 - 5. Shop drawings
 - 6. Shop prime coat and field touch-up
- C. Work not included but specified elsewhere:
 - 1. Steel roof and floor deck
 - 2. Field painting (except for touch-up)
 - 3. Ladders (steel)

1.02 REFERENCE STANDARDS

- A. 29 CFR 1926 - U.S. Occupational Safety and Health Standards; current edition.
- B. AISC (MAN) - Steel Construction Manual; 2011.
- C. AISC 360 - Specification for Structural Steel Buildings; 2010.
- D. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.
- E. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.
- F. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- G. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2014.
- H. ASTM A449 - Standard Specification for Hex Cap Screws, Bolts and Studs, Steel, Heat Treated, 120/105/90 ksi Minimum Tensile Strength, General Use; 2010.
- I. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2013.
- J. ASTM A514/A514M - Standard Specification for High-Yield-Strength, Quenched and Tempered Alloy Steel Plate, Suitable for Welding; 2014.
- K. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts; 2007a (Reapproved 2014).
- L. ASTM A992/A992M - Standard Specification for Structural Steel Shapes; 2011 (Reapproved 2015).
- M. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2014.
- N. ASTM E94 - Standard Guide for Radiographic Examination; 2004 (Reapproved 2010).
- O. ASTM E164 - Standard Practice for Contact Ultrasonic Testing of Weldments; 2013.
- P. ASTM E165/E165M - Standard Test Method for Liquid Penetrant Examination for General Industry; 2012.

- Q. ASTM E709 - Standard Guide for Magnetic Particle Testing; 2014.
- R. ASTM F436/F436M - Standard Specification for Hardened Steel Washers Inch and Metric Dimensions; 2016.
- S. ASTM F959 - Standard Specification for Compressible-Washer-Type Direct Tension Indicators for Use with Structural Fasteners; 2013.
- T. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength; 2007a.
- U. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.
AH. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015.
- V. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel; International Accreditation Service, Inc; 2011.
- W. ITS (DIR) - Directory of Listed Products; current edition.
- X. AL. SSPC-SP 3 - Power Tool Cleaning; 1982 (Ed. 2004).
- Y. American Institute of Steel Construction (AISC) "Specification for Structural Steel Buildings, AISC 360-10.
- Z. AISC "2004 RCSC Specification for Structural Joints Using ASTM A325 or A490 Bolts"
- AA. AISC "Code of Standard Practice for Steel Buildings and Bridges," March 18, 2005, with the following exclusions: Section 1.5.1, Section 4.4 - second sentence, Section 7.5.4.
- BB. American National Standards Institute (ANSI).
- CC. American Iron and Steel Institute (AISI).
- DD. Steel Structure Painting Council (SSPC).
- EE. Occupational Safety and Health Act (OSHA).

1.03 SUBMITTALS

- A. Submit erection drawings, detailed shop drawings and schedules, properly checked and coordinated with other parts of the construction. No reproduction of Contract Drawings for use as shop drawings will be permitted.
 - 1. Indicate profiles, sizes, spacing, locations of structural members, openings, attachments, and fasteners.
 - 2. Connections not detailed.
 - 3. Indicate cambers and loads.
 - 4. Indicate welded connections with AWS A2.4 welding symbols. Indicate net weld lengths.
 - 5. These drawings shall show: type of steel for each member, location and identification mark of each member; dimensions; size and weight of members; location of shop and field connections; weld details; welded sequence; and painting requirements. (The Welding symbols used shall be as adopted by the American Welding Society.)
 - 6. No splices in members will be permitted except where fully detailed on the shop drawings, approved by the Architect/Engineer.
 - 7. These drawings shall show all requirements such as (1) temporary members required for erection, including connections; and (2) all openings referred to under "fabrication" in this section.
 - 8. Except as otherwise noted, the approval of shop drawings will be for size and arrangement of principal and auxiliary components and strength of connections. Any error in dimensions shown on the shop drawings shall be the responsibility of the Contractor.
- B. Manufacturer's Mill Certificate: Certify that products meet or exceed specified requirements.
- C. Mill Test Reports: Indicate structural strength, destructive test analysis and non-destructive test analysis.

- D. Fabricator Test Reports: Comply with ASTM A1011/A1011M.
- E. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.
 - 1. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.
- F. Submit a description of the methods, sequence of erection, and type of equipment proposed for erecting the structural steel work.
- G. Fabrication of any material, cutting of any holes, or performance of any work shall not proceed until shop drawings have been approved by the Architect/Engineer.
- H. Certified copies, in triplicate, of mill test reports, including names and locations of mills and shops and analysis of chemical and physical properties of steel to be used on this project, shall be submitted to the Architect/Engineer before delivery to the job site.
- I. Manufacturer's certification, in triplicate, of bolt washers, nuts, and filler metal for welding shall be submitted to the Architect/Engineer.
- J. Furnish an affidavit certifying that throughout fabrication the identification of steel having a specified minimum yield point exceeding 36,000 psi has been maintained in accordance with ASTM A6/A6M and AISC recommended practice for identification of high strength steel during fabrication.
- K. Unless otherwise agreed upon by the Architect/Engineer in writing, the Architect/Engineer shall have sixteen (16) working days, from the day the shop drawings are received, in which to review structural steel shop drawings.

1.04 QUALITY ASSURANCE

- A. Fabricate structural steel members in accordance with AISC (MAN) "Steel Construction Manual."
- B. Comply with Section 10 of AISC 303 for architecturally exposed structural steel.
- C. Maintain one copy of each document on site.
- D. Fabricator: Company specializing in performing the work of this section with minimum 10 years of documented experience.
- E. Fabricator Qualifications: A qualified steel fabricator that is accredited by the International Accreditation Service (IAS) Fabricator Inspection Program for Structural Steel in accordance with IAS AC172.
 - 1. The contractor shall have completed project of similar scope and have adequate facilities to meet production requirements and have satisfactory capabilities to maintain proper job progress. It is imperative that steel is delivered to the site on schedule and in the sequence required for efficient erection on schedule.
 - 2. The Fabricator and Erector shall have in place and maintain a quality assurance program, meeting the approval of the Architect/Engineer, to ensure that the work is performed in accordance with the requirements referenced in the AISC Code of Standard Practice, the AISC Specification for Structural Steel Buildings, and these Contract Documents. Certification under the AISC Quality Certification Program for Complex Building Structures for fabricators and/or under the AISC Erector Certification Program for erectors is recommended.
 - 3. Certification of Welders: All shop and field welding shall be executed by AWS Certified welders who have been specifically certified for the type of work to be performed. Certifications shall be considered current if dated within the past 12 months. Welders will be considered certified if they have been certified by AWS and their work records are current within every 6-month period thereafter, as required by AWS. Certifications and records must comply with AWS standards. Certifications and appropriate records must be provided to the Architect/Engineer prior to beginning work.

- F. Erector: Company specializing in performing the work of this section with minimum 10 years of documented experience.
- G. Design connections not detailed on the drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.
- H. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code-Steel."
- I. Comply with applicable provisions of the following specifications and documents:
 - 1. AISC's 360-10 "Specification for Structural Steel Buildings--Allowable Stress Design and Plastic Design," and including the "Commentary of the AISC Specification," and the current supplements.
 - 2. RCSC's "Specification for Structural Joints Using ASTM A325 or ASTM A490 Bolts."

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Handle, transport and stack all materials carefully to prevent deformation or damage. Store all structural steel members carefully on substantial timbers and blocking, so arranged that the steel will be free from the earth and properly drained, preventing any splattering with dirt or accumulation of water in or about the steel. Take care to prevent the accumulation of mud, or other foreign matter on the steel. Such accumulation shall be completely removed prior to erection.
- B. Deliver all steel pieces to the site in the sequence required for efficient erection on schedule. The importance of timely sequencing of steel deliveries for on-schedule steel erection is emphasized due to the nature of this fast-track project and the impact on all following construction trades and Owner daily operations.
- C. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from erosion and deterioration.
 - 1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.
- D. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.
 - 1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
 - 2. Clean and relubricate bolts and nuts that become dry or rusty before use.
 - 3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F 1852 fasteners and for retesting fasteners after lubrication.

1.06 COORDINATION

- A. Furnish anchorage items to be embedded in or attached to other construction without delaying the work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.
- B. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' recommendations to ensure that shop primers and topcoats are compatible with one another.

PART 2 PRODUCTS

ALL PRODUCTS AND MANUFACTURERS LISTED IN THIS SPECIFICATION ARE ESTABLISHING A BASIS OF DESIGN. OTHER PRODUCTS AND MANUFACTURERS OF EQUAL QUALITY MAY BE SUBMITTED FOR REVIEW AND APPROVAL. THE INTENT IS NOT TO LIMIT PRODUCTS AND MANUFACTURERS USED TO THOSE IDENTIFIED IN THESE SPECIFICATIONS.

2.01 MATERIALS

- A. Steel Angles and Plates: ASTM A36/A36M.
- B. Steel W Shapes and Tees: ASTM A992/A992M.
- C. Rolled Steel Structural Shapes: ASTM A992/A992M.
- D. Cold-Formed Structural Tubing: ASTM A500/A500M, Grade C.
- E. Steel Bars: ASTM A108 Grade 60.
- F. Structural Bolts and Nuts: Carbon steel, ASTM A307, Grade A and galvanized in compliance with ASTM A153/A153M, Class C.
- G. Tension Control Bolts: Twist-off type; ASTM F3125/F3125M.
- H. Unheaded Anchor Rods: ASTM F1554, Grade 36, plain, with matching ASTM A563 or ASTM A563M nuts and ASTM F436/F436M Type 1 washers.
- I. Headed Anchor Rods: ASTM A 307, Grade C, plain.
- J. Load Indicator Washers: Provide washers complying with ASTM F959 at connections requiring high-strength bolts.
- K. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
 - 1. Shop and Touch-Up Primer: Fabricator's standard, complying with VOC limitations of authorities having jurisdiction.
- L. Touch-Up Primer for Galvanized Surfaces: Fabricator's standard, complying with VOC limitations of authorities having jurisdiction.
- M. Structural steel W-shapes shall be newly rolled steel conforming to ASTM A992-04a or ASTM 572-04 with special requirements, Grade 50 or ASTM A913-04, Grade 50 Steel. Other structural steel shapes and plates shall be newly rolled steel conforming to ASTM A36/A-04 or ASTM A572-04, Grade 50. Structural tubes ASTM A500-07, Grade B with yield strength = 46 KSI. Structural pipes ASTM A53-07, Grade B with yield strength = 35 KSI.
- N. Structural shapes and plates shall be fabricated from newly rolled (milled) one-piece sections without splices, unless specifically noted otherwise on the structural contract drawings.
- O. High strength bolts shall conform to ASTM A325 (or ASTM A1852 - twist-off) or ASTM A490, as shown on the drawings. Nuts shall conform to ASTM A563 and hardened washers shall conform to ASTM F436, unless specifically indicated otherwise.
- P. Anchor bolts/rods shall conform to ASTM A36/A36M, ASTM F1554 - Grades 36, 55, and 105, ASTM A354, or ASTM A449 with ASTM A563 Heavy Hex nuts and ASTM F436 hardened washers, Grade A, as shown on drawings.
- Q. All welding shall be performed using E70XX electrodes, except E60XX series electrodes may be used for steel decking. All electrodes shall have a Sharp V-notch toughness rating equal to or exceeding 20 ft-lbs. at (-20) degrees Fahrenheit.
- R. Deformed Bar Anchors (DBA): All DBA'S shall comply with ASTM A496
- S. Headed Stud Anchors (HSA): Manufacture all HSA's in conformance with ASTM A108 with dimensions complying with AISC Specifications.
- T. Provide all HSS sections with a 1/4" (min.) thick full size closure plate, unless noted otherwise.

2.02 FABRICATION

- A. Shop fabricate to greatest extent possible.
- B. Space shear stud connectors as indicated on the drawings.
 - 1. Continuously seal joined members by continuous welds. Grind exposed welds smooth.
- C. Fabricate connections for bolt, nut, and washer connectors.
- D. Develop required camber for members.
- E. Provisions for attachment of other materials: punch and drill steel for attachment of other materials indicated on the drawings or noted in the specification to be attached to the steel.
- F. Connections for structural steel members shall comply with these specifications and the structural contract drawings, unless specific written approval is given by the Structural Engineer of record.
- G. Shop Connections: All shop fabricated connections shall be welded (and/or bolted) using bearing type bolts or friction type, high strength bolts, installed by the modified turn-of-the-nut method, unless otherwise indicated.
- H. Welding:
 - 1. Shop welding shall be done by either metal-arc welding or submerged arc-welding.
 - 2. Groove welds shall have complete penetration unless otherwise noted on the drawings.
 - 3. Minimum Welds: All intersecting steel shapes that are not bolted shall be connected by a fillet weld, all around, unless specifically noted otherwise. All welds shall conform to AISC Specifications. Fillet weld sizes that are not shown shall be 1/16" less than the thinnest of the connected parts for thicknesses 1/4" and larger. Fillet welds on pieces less than 1/4" shall be of the same size as the thinnest of the connected parts.
 - 4. Reinforcing Bars: Do not weld reinforcing bars, except as specifically detailed in the contract documents. In such cases, use only AWS standards. Do not substitute reinforcing bars for deformed bar anchors (DBA's), machine bolts, or headed stud anchors (HSA's).
- I. Oxygen Cutting: Manual oxygen cutting shall be done only with a mechanically guided torch. Alternatively, an unguided torch may be used provided that cut is not within 1/4" of the finished dimension and the final removal is completed by chipping or grinding to provide a surface quality equal to that of the base metal edges. The use of oxygen-cut holes for bolted connections will not be permitted; components prepared in this manner will be rejected.
- J. No oversize holes may be used on bolted connections except where specifically approved.
- K. Identification: Structural steel members shall have assigned positions and identification mark or symbol, plainly indicated thereon near one end. Marks shall agree with those given on the shop drawings and erection drawings relating to or calling for the members. Marking should be accomplished in such a way that identification mark will not bleed through finish paint.

2.03 FINISH

- A. Prepare structural component surfaces in accordance with SSPC-SP 3 10.
- B. Shop prime structural steel members. Do not prime surfaces that will be fireproofed, field welded, in contact with concrete, or high strength bolted.
 - 1. Galvanize structural steel members to comply with ASTM A123/A123M. Provide minimum 1.7 oz/sq ft galvanized coating.
- C. Steel to be Painted:
 - 1. Generally, the structural steel shall receive one shop coat of primer paint. See Section 09 9000 - Painting and Coating, 09 9113 - Exterior Painting, or 09 9123 - Interior Painting.
 - 2. Thoroughly clean steel to be painted.
 - 3. Surfaces requiring paint shall be painted only to within two inches of any field weld or friction type, high strength bolted connection. If for any reason the surface to be field

welded or bolted is painted, such paint shall be completely removed to within the stated limits before field welding or bolting.

- D. Steel to be Left Unpainted:
 - 1. Contact surfaces (e.g., high strength bolted connections and welded connections).
- E. Shop Painting:
 - 1. After steel has been properly prepared as specified above, apply primer paint to dry steel surfaces by brush, spray or roller, insuring no running or sagging in accordance with manufacturer's directions.
 - 2. The coverage rate per coat shall not be more than 400 square feet per gallon resulting in a wet film thickness of four (4) mils and providing a minimum dry film thickness of two (2) mils.

2.04 SOURCE QUALITY CONTROL

- A. Provide shop testing and analysis of structural steel as required per the Quality Assurance Plan.
- B. Welded Connections: Visually inspect all shop-welded connections using one of the following:
 - 1. Radiographic testing performed in accordance with ASTM E94.
 - 2. Ultrasonic testing performed in accordance with ASTM E164.
 - 3. Liquid penetrant inspection performed in accordance with ASTM E165/E165M.
 - 4. Magnetic particle inspection performed in accordance with ASTM E709.
- C. The contractor shall maintain and pay for his own quality control and inspection of all shop work. Records of tests shall be readily available for examination by the Architect/Engineer or his designated representative and copies of which shall be turned over to the Architect/Engineer upon request.
- D. Acceptance at the shop shall not prevent final rejection at the job site if work is found to be defective in any way.
- E. Unless otherwise noted, when compliance with the referred specifications, etc., or this specification, is specified for materials or a manufactured or fabricated product, the contractor, if requested, shall furnish the Architect/Engineer with an affidavit from the manufacturer or fabricator certifying that the material product delivered to the project meets the requirements of the contract document.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that conditions are appropriate for erection of structural steel and that the work may properly proceed.

3.02 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and according to:
 - 1. AISC 303 and AISC 360
 - 2. OSHA Construction Industry Standards (29 CFR 1926)
 - 3. Specified requirements.
 - 4. AISC "Code of Standard Practice for Steel Buildings and Bridges".
- B. Allow for erection loads, and provide sufficient temporary bracing to maintain structure in safe condition, plumb, and in true alignment until completion of erection and installation of permanent bracing.
- C. Field weld components and shear studs indicated on shop drawings.
- D. Use carbon steel bolts only for temporary bracing during construction, unless otherwise specifically permitted on drawings. Install high-strength bolts in accordance with RCSC (HSBOLT) "Specification for Structural Joints Using High-Strength Bolts".

- E. Do not field cut or alter structural members without approval of Architect/Engineer.
- F. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.
 - 1. Field connections shall be one of the following:
 - 2. Bolted connections using ASTM A307 bolts brought up to and beyond snug tight after faying surfaces are in contact. A307 to be used only in miscellaneous steel members.
 - 3. High strength steel bolts conforming to ASTM A325.
 - a. Installation shall be performed by using pneumatic powered impact wrenches with sufficient capacity and an adequate supply of compressed air.
 - b. Installation shall be performed in accordance with the turn-of-the-nut method outlined in the AISC "Specification for Structural Joints Using ASTM A325 or ASTM A490 Bolts", with the following modifications:
 - 1) Use a hardened washer under either the bolt head or nut, whichever is turned in tightening.
 - 2) Qualifications of high strength bolting procedures and operations shall be as specified under "Qualifications" in this section.
 - c. Pre-calibrated bolts similar and equal to Le June bolts may be substituted. Submit sample and manufacturer qualifications for approval by Architect/Engineer.
 - 4. Welding:
 - a. Field welding shall be executed in accordance with all the requirements under "Fabrication: Welding" in this section excepting those requirements which manifestly apply to shop conditions only.
 - b. Field welding shall be accomplished by using either the shielded metal arc (SMAW) or the flux-cored arc (FCAW) welding process.
- G. Special provisions for full penetration welds used in moment frames: These special provisions shall apply to shop or field welded moment connections. Welding methods, procedures and quality control shall comply with AWS D1.1-2010 and the following:
 - 1. Tack weld quality shall comply with AWS D1.1/D1.1M, Section 3.3.7.
 - 2. Arc strikes, gouges and other imperfections within or adjacent to the joint shall be repaired or removed.
 - 3. Preheat and interpass requirements shall be as outlined in AWS D1.1/D1.1M, Section 4.2.
 - 4. Use weld tabs and finish to a smooth contour, per AWS D1.1, Section 3.12.3.
 - 5. Backer bars shall be removed from the beam, bottom flange, connections to remove all slag and cracks. Weld the back-gouged region and finish welding using a reinforcing fillet weld, according to AWS D1.1/D1.1M, Section 3.13.4.
 - 6. Cracks, Gouges, grooves and notches will not be permitted in the joint area.
- H. Oxygen cutting in the field shall be executed in accordance with the requirements under "Fabrication: Oxygen Cutting" in this section.
- I. Templates shall be furnished for all anchor bolts. Furnish instructions for settling of anchors and bearing plates and ascertain that items are properly set during the progress of the work.
- J. Anchor bolts set by others shall be verified for proper size and accurate location prior to erection of structural steel work.
- K. Framing: As erection progresses, the work shall be securely connected to take care of all dead load, wind and erection stresses. Temporary bracing shall be introduced wherever necessary to take care of all loads to which the structure may be subjected, including erection equipment and its operation. Such bracing shall be left in place as long as may be required for safety. It shall finally be removed by the contractor as part of his equipment.
- L. Fastening of splices of compression members shall be done after the abutting surfaces have been brought completely into contact. Bearing surfaces and surfaces that will be in permanent contact shall be cleaned prior to final assembly of members.

- M. Tolerances: All members shall be aligned, leveled and adjusted accurately prior to final fastening. Tolerances shall conform to the AISC "Code for Standard Practice."
- N. All members shall be cut neat, true bevel or square and should be erected true and flush without twists and open joints. Light drifting to draw holes together will be permitted. Reference should be made to the code and specifications listed under General Requirements which shall govern all phases of fabrication, details, and erection and workmanship. Responsibility for all errors of fabrication and proper fitting of the various members shall be assumed by this contractor.
- O. Framing and Bracing:
 - 1. All structural steel shall be erected true and plumb. Temporary shoring and bracing shall be used wherever necessary and shall be adequate for all loads to which the structure may be subjected, including wind and erection equipment and operation of same. Leave temporary bracing and shoring in place as long as may be required for safety, and until final framing construction is completed.
 - 2. No final connections shall be made until the structure has been properly aligned. All temporary flooring, planking and scaffolding necessary in connection with the erection of the structural steel, or the support of erection machinery shall be provided as part of the erection work. The temporary floors and scaffolding shall conform to the requirements of all laws governing safety regulations.
 - 3. Drifting done during assembly shall not distort the metal or enlarge the holes. Mismatching of holes greater than 3/32 inch shall require reaming for the next larger bolt. Mismatching of holes greater than 1/8" shall be cause for rejection.
- P. Defective Work:
 - 1. Work found to be defective, missing or damaged shall be immediately replaced with proper work. Such replaced work and the inspection for same shall be at the expense of the Contractor.
 - 2. Straightening of any material, if necessary, shall be done by a process and in a manner that will not injure the materials, and which is approved by the Architect/Engineer. Sharp kinks or bends shall be cause for rejection. Heating will not be allowed.
 - 3. Delamination and other rolling defects in structural shapes and plates shall be cause for rejection when, in the judgment of the Architect/Engineer repairs are not feasible or acceptable.
 - 4. If defects or damaged work cannot be corrected in the field, the material shall be returned to the shop or new parts furnished, as the Architect/Engineer directs; the Contractor shall replace all work at his own expense.

3.03 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.

3.04 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.

3.05 TESTING AGENCY

- A. Testing Agency - The Owner shall engage the services of an independent testing laboratory to perform the following services, the cost of which shall be paid by the Owner.
- B. Prior to the fabrication and erection of any structural steel, a meeting shall be arranged by the Contractor for the Architect/Engineer, Steel Erector, and Testing Laboratory Inspector to review qualifications of welders, bolt tightening procedure, stud welding procedure, and procedures the Testing Laboratory Inspector(s) will follow.

1. The installation and tightening of bolts shall be observed by the Testing Laboratory Inspector to determine that the selected bolt tightening procedure is properly followed and he shall test all field connections to determine that all bolts are tightened in accordance with the ASTM A325 Specifications.
 2. Welding inspection shall include one hundred percent (100%) testing by ultrasonic method of all beam to column full penetration welds. Welding inspection shall also include one hundred percent (100%) testing by ultrasonic method, or by other approved equivalent methods conforming to AWS D1.1, or all groove welds which are part of the seismic force resisting systems. The cost of retesting any defective welds shall be borne by the Contractor. A qualified welding inspector shall be employed to perform the duties as outlined in the AWS D1.1 Section 6, Inspection. Welding inspection shall also include visual checking of all critical fillet welds.
 3. The nondestructive testing rate for an individual welder may be reduced to 25 percent with the concurrence of the Structural Engineer of Record, provided that the rejection rate is demonstrated to be 5 percent or less of the welds tested for the welder.
- C. Promptly furnish to the Architect/Engineer and Owner the reports of the Testing Laboratory on the above testing.
- D. Testing Coordination - Cooperate with and facilitate inspection and testing by the testing agency. It is recommended that the steel erector contractor and steel fabricator contact the approved testing lab, of the Owner's choice prior to beginning any welding. A program of joint preparation and welding procedures should be worked out between the two parties before the welding is started so that correct welds will be made from the beginning. Furnish the testing agency, upon request with the following:
1. Complete sets of approved erection drawings, detailed shop drawings, schedules and corrective work procedures at the fabrication shop or shops and in the field.
 2. Cutting list, order lists, material bills, and shopping lists.
 3. Information as to time and place of all rollings and shipment of material to shops.
 4. Assistance for testing materials and proper facilities for inspection of the work, in the mill, shop, and field.

3.06 TESTS AND INSPECTIONS

- A. All structural steel materials shall be tested, and all welding and fabrication shall be inspected by the Owner's testing laboratory. The Owner may test all welds by means of X-Ray, ultrasonic, or any other appropriate, non-destructive procedure. Additional testing required as a result of corrective measures to correct defects shall be paid by the Contractor. Testing shall comply with the requirements of AWS 7. A copy of all weld testing reports shall be provided to the structural engineer.
- B. Structural Steel: Mill analysis and test reports certified and properly executed by the manufacturer will constitute sufficient evidence of conformity with the specifications. Contractor shall identify steel as to heat number and furnish the testing laboratory mill tests and manufacturer's certification for each heat of steel. If the material cannot be identified or its source is questionable, one set of tension and bend tests shall be made by the testing laboratory for each 5 tons or fractional part thereof of each size.
1. The cost of all tests, including sampling and machining of test coupons, will be paid by the Owner.
 2. The Contractor shall cooperate with testing engineers and provide all materials required to take coupons for testing.
- C. Fabrication Inspection: All fabrication of structural steel shall be inspected by the fabricator. This inspection shall consist of, but shall not necessarily be limited to, the following:
1. Visually inspect steel shapes and plates for existence of defects, such as laminations and non-metallic inclusions. Use ultrasonic equipment to determine extent of defects.
 2. Confirm that sections used conform to dimensional standards specified.

3. Ultrasonic testing of base plates, column flanges at beam and girder moment connections and bracing connections, and top and bottom flanges of beams at bracing connections shall be performed in accordance with ASTM A578-80. For column flanges, inspect an area extending 6" above and 6" below point where beam and/or girder flanges are attached. For column and beam flanges, inspect an area extending 6" beyond each end of bracing connections where attached to the flanges. Any recordable discontinuity causing complete loss of back reflection and which cannot be encompassed within a 3-inch diameter circle or one-half the plate thickness, whichever is larger, is unacceptable. Inspect connection areas on all beams and columns.
- D. Welding Inspection: Welding shall be inspected by a qualified inspector employed by the testing laboratory. This inspector shall confirm the qualification of welders, the use of AWS qualified procedures, the manufacturer's recommended use of automatic equipment, and the proper use of preheat, if required.
1. All complete penetration groove welds and partial penetration groove welds shall be subject to ultrasonic testing by qualified technician, who shall operate the equipment, examine the welds and maintain a record of all welds examined, defects found and disposition of each defect. All defective welds shall be repaired by the Contractor and retested with ultrasonic equipment at the expense of the Contractor.
 2. Initially, all welds requiring ultrasonic testing shall be tested at the rate of 100% in order to establish the qualifications of each individual welder.
 3. When ultrasonic indications arising from the weld root can be interpreted as either a weld defect or the backing strip itself, the backing strip shall be removed at the expense of the Contractor, and if no root defect is visible, the weld shall be retested. If no defect is indicated on this retest, and no significant amount of the base and weld metal has been removed, no further repair of welding is necessary. If a defect is indicated, it shall be repaired by the Contractor and retested at the expense of the Contractor.
 4. The ultrasonic instrumentation shall be calibrated by the technician to evaluate the quality of the welds in accordance with AWS D1.1.
 5. Headed stud anchor (HSA's) welding and deformed bar anchor (DBA) welding shall conform to the manufacturer's specifications. Welding shall be tested to comply with AWS D1.1, Section 7.6 through 6.8 and Appendix K of the AISC Specifications.
 6. Where runoff tabs are used, they shall be removed and the edges shall be ground smooth and shall be visually inspected in conformance with AWS D1.1, Subsection 8.15.
- E. Erection Inspection: All erection of structural steel shall be inspected by the testing laboratory. Provisions under Fabrication and Welding Inspection shall apply.
1. All welding shall be inspected by the testing laboratory. Butt and complete penetration welds shall be ultrasonically tested as per provisions under Welding Inspection.
 2. High strength bolting shall be inspected by the testing laboratory in conformance with the Specifications for Structural Joints using ASTM A325 and ASTM A490 bolts, as approved by the Research Council on Riveted and Bolted Structural Joints of the Engineering Foundation.
- F. Welded connections between the primary members of Intermediate and Special Moment Resisting Steel Frames (IMRSF) and (SMRSF) shall be tested for compliance according to SBC Section 1708.2 and these Contract Specifications and Plans. Inspection shall be done by a qualified testing inspector. As a minimum, the testing shall include the following:
1. All complete penetration groove welds contained in joints and splices shall be tested 100%, either by ultrasonic testing or by radiography.
 2. Partial penetration groove welds, when used in column splices, shall be tested either by ultrasonic testing or radiography. A minimum of 50% of these welds shall be tested.
 3. Any material discontinuities shall be accepted or rejected on the basis of the defect rating in accordance with the AWS Standards as they refer to the testing on AWS D1.1-84, Chapter 6, excluding Sections 6.1 through and including 6.6. All deficient welds shall be

corrected and tested at no additional cost to the Owner.

G. Source Quality Control:

1. The Contractor shall maintain his own quality control and inspection of all shop work. Records of tests shall be readily available for examination by the Architect/Engineer or his designated representative and copies of which shall be turned over to the Architect/Engineer upon request.
2. Acceptance at the shop shall not prevent final rejection at the job site if work is found to be defective in any way.
3. Unless otherwise noted, when compliance with the referenced specifications, etc., or this specification is specified for materials or a manufactured or fabricated product, the Contractor, if requested, shall furnish the Architect/Engineer with an affidavit from the manufacturer or fabricator certifying that the material product delivered to the project meets the requirements of the Contract Documents.

END OF SECTION

**SECTION 05 5000
METAL FABRICATIONS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Furnishing materials and installation of shop fabricated steel and miscellaneous iron work.
- B. Related Work: The following items are specified in other Sections.
 - 1. Beams and hangers.
 - 2. Cap plates, and anchor bolts.
 - 3. Connections, field and shop welded, and bolted.
 - 4. Bracing.
 - 5. Hangers.
 - 6. Miscellaneous methods.

1.02 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
- C. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
- D. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.
- E. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2023.
- F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
- G. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength; 2023.
- H. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.
- I. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2023).
- J. AWS D1.2/D1.2M - Structural Welding Code - Aluminum; 2014, with Errata (2020).
- K. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel AC172; 2019.
- L. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.
- M. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.
- N. SSPC-SP 2 - Hand Tool Cleaning; 2018.

1.03 SUBMITTALS

- A. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
 - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
- B. Welders' Certificates: Submit certification for welders employed on the project, verifying AWS qualification within the previous 12 months.

- C. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.
- D. Field measurements and proper material installation shall be verified by the Contractor.

1.04 QUALITY ASSURANCE

- A. Fabricator Qualifications: A qualified steel fabricator that is accredited by IAS AC172.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Protection: Use all means necessary to protect materials of this Section before, during and after installation and to protect existing equipment, installed work and materials of other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect/Engineer and at no additional cost to the Owner.
- C. Delivery and Storage: Deliver all materials to the job site in their original unopened containers with all labels intact and legible at time of use. Store in strict accordance with the manufacturer's recommendations as approved by the Engineer.

PART 2 PRODUCTS

2.01 MATERIALS - STEEL

- A. Steel Sections: ASTM A36/A36M.
- B. Steel Tubing: ASTM A500/A500M Grade B cold-formed structural tubing.
- C. Plates: ASTM A36/A36M.
- D. Fasteners and Accessories: Furnish anchors and fasteners, washers, straps, and accessories as required for a complete and finished installation. Fasteners shall be stainless steel or galvanized steel as appropriate and approved for the location.
- E. Concrete and Masonry Anchors: Unless noted otherwise, where anchors are not cast into the concrete or masonry construction, provide hot-dip galvanized expansion type anchors with matching hot-dip galvanized steel bolts or studs with nuts, of sizes as indicated or required. Provide washers under all bolt heads and nuts.
- F. Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, plain.
- G. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- H. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- I. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.
- J. Structural and miscellaneous steel not otherwise specified, shall conform to the Standard Specifications of the ASTM A36, latest edition.
- K. Galvanized steel pipe shall conform to the requirements of Federal Specifications WW-P-406, Type I, Class A, zinc-coated.
- L. Steel sheets and strips shall conform to the requirements of Federal Specifications QQ-S-636.
- M. All ferrous metals, except surface encased in concrete, shall be given one (1) shop coat, and all scratched, abraded or re-worked surfaces shall, before final painting, receive a coat of rust-inhibitive paint which meets the performance requirements of red lead mixed pigment, alkyd varnish, linseed oil paint FS TT-P-86, Type II; or red lead iron oxide, raw linseed oil, alkyd paint, Steel Structures Painting Council (SSPC) Paint 2-64; or basic lead silicon chromate base iron oxide, linseed oil, alkyd paint, FS TT-P-615, Type II.
- N. Stainless steel: ASTM A276, type 316.

2.02 FABRICATION

- A. Fit and shop assemble items in largest practical sections, for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Continuously seal joined members by intermittent welds and plastic filler.
- D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.03 FABRICATED ITEMS

- A. Bollards: Steel pipe, concrete filled, crowned cap, as detailed; prime paint finish.
- B. Ledge Angles, Shelf Angles, Channels, and Plates Not Attached to Structural Framing: For support of metal decking; prime paint finish.
- C. Lintels: As detailed; prime paint finish.
- D. Sill Angles for Tempered Glass Railing Assemblies: ASTM A36/A36M steel angles with anchoring devices and sizes as indicated in shop drawings for railing assembly, drilled and tapped for fastener types, sizes, and spacing indicated, prime paint finish.
- E. Recessed Mat Frames : As detailed; steel, galvanized finish.
- F. Foot Scrapers, Mud and Foot Grilles, and Pans: As detailed; aluminum, mill finish.

2.04 FINISHES - STEEL

- A. Prime paint steel items.
 - 1. Exceptions: Galvanize items to be embedded in concrete and items to be embedded in masonry.
 - 2. Exceptions: Do not prime surfaces in direct contact with concrete, where field welding is required, and items to be covered with sprayed fireproofing.
- B. Prepare surfaces to be primed in accordance with SSPC-SP2.
- C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- D. Prime Painting: One coat.
- E. Galvanizing of Structural Steel Members: Galvanize after fabrication to ASTM A123/A123M requirements. Provide minimum 1.7 oz/sq ft galvanized coating.
- F. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements.

2.05 FABRICATION TOLERANCES

- A. Squareness: 1/8 inch maximum difference in diagonal measurements.
- B. Maximum Offset Between Faces: 1/16 inch.
- C. Maximum Misalignment of Adjacent Members: 1/16 inch.
- D. Maximum Bow: 1/8 inch in 48 inches.
- E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Verify that field conditions are acceptable and are ready to receive work. Examine the areas and conditions under which miscellaneous metal items are to be installed, and correct conditions detrimental to the proper and timely completion of the work. Do not proceed until unsatisfactory conditions have been corrected.
- B. After fabrication, all members shall be given a shop coat of rust inhibitive primer.

3.02 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Furnish setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

3.03 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Field weld components as indicated on drawings.
- D. Perform field welding in accordance with AWS D1.1/D1.1M.
- E. Obtain approval prior to site cutting or making adjustments not scheduled.
- F. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.
- G. Fastening to in-place construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction including threaded fasteners for concrete inserts, toggle bolts, through-bolts, lag bolts, wood screws, and other connectors as required.
- H. Cutting Fitting and Placement:
 - 1. Perform cutting, drilling and fitting required for installation of miscellaneous metal fabrications.
 - 2. Set work accurately in location, alignment and elevation, and make plumb level, true, and free from the rack measured from established lines and levels.
 - 3. Provide temporary bracing and anchors in formwork for items which are to be built into concrete or similar construction.
 - 4. Fit exposed connections accurately together to form tight hairline joints.
 - 5. Weld connections which are not to be left as exposed joints but cannot be shop welded because of shipping size limitations.
 - 6. Grind exposed joints smooth, and touch up shop paint coat. Do not weld, cut or abrade the surfaces of exterior units which have been hot-dip galvanized after fabrications and are intended for bolted or screwed field connections.
- I. Field welding: Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance and quality of weld made, and methods in correcting welding work.
- J. Touch-Up Painting: Immediately after erection, clean field welds, bolted connections and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting. Apply by brush or spray to provide minimum dry field thickness of 2.0 mils.

3.04 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.

- C. Maximum Out-of-Position: 1/4 inch.

3.05 GALVANIZING REPAIR

- A. Galvanized surfaces which have become damaged from welding, handling, or installation shall be repaired immediately after installation with galvanizing repair material in accordance with ASTM A780.

END OF SECTION

**SECTION 22 0519
METERS AND GAUGES FOR PLUMBING PIPING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Flow meters.
- B. Pressure gauges and pressure gage taps.
- C. Strainers.
- D. Pressure-temperature test plugs.

1.02 REFERENCE STANDARDS

- A. ASME B40.100 - Pressure Gauges and Gauge Attachments; 2022.
- B. ASME MFC-3M - Measurement of Fluid Flow in Pipes Using Orifice, Nozzle, and Venturi; 2004 (Reaffirmed 2017).
- C. AWWA M6 - Water Meters -- Selection, Installation, Testing, and Maintenance; 2012, with Addendum (2018).
- D. UL 393 - Indicating Pressure Gauges for Fire-Protection Service; Current Edition, Including All Revisions.

1.03 SUBMITTALS

- A. Product Data: Provide list that indicates use, operating range, total range and location for manufactured components.
 - 1. Submit brochures and other supportive data as might be required for approval of all items differing from those specified.
- B. Project Record Documents: Record actual locations of components and instrumentation.
- C. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. Extra Pressure Gauges: One of each type and size.

1.04 QUALITY ASSURANCE

- A. Ranges for thermometer, gages or similar instruments shall be selected so that normal operation will be near center of scale. Range shall not be longer than required. Use compound gage where vacuum may be encountered.
- B. Combination instruments for thermometers and gages will not be acceptable.

1.05 FIELD CONDITIONS

- A. Do not install instrumentation when areas are under construction, except for required rough-in, taps, supports and test plugs.

PART 2 PRODUCTS

2.01 LIQUID FLOW METERS

- A. Manufacturers:
 - 1. McCrometer: www.mccrometer.com.
 - 2. Or approved equal.
- B. Calibrated ASME MFC-3M venturi orifice plate and flanges with valved taps, chart for conversion of differential pressure readings to flow rate, with pressure gage in case.
- C. Annular element flow stations with meter set.
 - 1. Measuring Station: Type 316 stainless steel pitot type flow element inserted through welded threaded couplet, with safety shut-off valves and quick coupling connections, and permanent metal tag indicating design flow rate, reading for design flow rate, metered fluid, line size, station or location number.

- a. Pressure rating: 275 psi.
 - b. Maximum temperature: 400 degrees F.
 - c. Accuracy: Plus 0.55 percent to minus 2.30 percent.
- D. Portable Meter Set: Dry single diaphragm type pressure gage with 6 inch dial pointer, stainless steel wetted metal parts, variable pulsation damper, equalizing valve, two bleed valves, and master chart for direct conversion of meter readings to flow rate, mounted in rust-proof carrying case with two ten foot long rubber test hoses with brass valves or quick connections for measuring stations.

2.02 PRESSURE GAUGES

- A. Manufacturers:
1. Dwyer Instruments, Inc: www.dwyer-inst.com.
 2. Moeller Instrument Company, Inc: www.moellerinstrument.com.
 3. Omega Engineering, Inc: www.omega.com.
 4. Trerice, Series 700.
 5. Or approved equal.
- B. Pressure Gages: ASME B40.100, UL 393 drawn steel case, phosphor bronze bourdon tube, rotary brass movement, brass socket, with front recalibration adjustment, black scale on white background. Pressure gages installed at pumps shall be liquid-filled case type.
1. Case: Steel with brass bourdon tube.
 2. Size: 4-1/2 inch diameter.
 3. Mid-Scale Accuracy: One percent.
 4. Scale: Psi and kPa.

2.03 PRESSURE GAGE TAPPINGS

- A. Gage Cock: Tee or lever handle, brass for maximum 150 psi.
- B. Needle Valve: Brass, 1/4 inch NPT for minimum 150 psi.
- C. Pulsation Damper: Pressure snubber, brass with 1/4 inch connections.
- D. Syphon: Steel, Schedule 40, 1/4 inch angle or straight pattern.

2.04 PRESSURE-TEMPERATURE TEST PLUGS:

- A. Test Plug: 1/4 inch or 1/2 inch brass fitting and cap for receiving 1/8 inch outside diameter pressure or temperature probe with neoprene core for temperatures up to 200 degrees F.
- B. Test Kit: Internally padded carrying case fitted with two 2-1/2 inch diameter pressure gauges, adapters, two 1/8 inch probes, and 1 inch dual-scale dial thermometers.

2.05 STRAINERS

- A. "Y" Type:
1. 1/2" through 2": Muessco No. 11, iron body, 250-lb SWP, 400-lb WOG, monel or stainless steel screen, blow-off outlet, screwed ends.
 2. 2-1/2" through 12": Muessco No.751, iron body, 125-lb SWP, 175-lb WOG, brass screen, blow-off outlet, flanged ends.
- B. Basket type:
1. Muessco No. 155, cast iron: through 4", 60-lb WOG; 5" through 10", 40-lb WOG; 12" and larger, 150-lb WOG, brass screen, drain connection, flanged ends.
- C. Screens - Water:
1. Brass.
 2. Perforations: up to 2", 1/10" diameter, 49 per sq. in.; 2-1/2" to 4", 1/8" diameter, 32 per sq. in.; 5" and up, 1/4" diameter, 8 per sq. in.

PART 3 EXECUTION**3.01 INSTALLATION**

- A. Install metering products in accordance with manufacturer's instructions.
- B. Provide one pressure gage per pump, installing taps before strainers and on suction and discharge of pump. Pipe to gage.
- C. Install pressure gages with pulsation dampers. Provide gage cock to isolate each gage. Extend nipples and siphons to allow clearance from insulation. Provide siphon on gages in steam systems.
- D. Coil and conceal excess capillary on remote element instruments.
- E. Provide instruments with scale ranges selected according to service with largest appropriate scale.
- F. Install gages in locations where they are easily read from normal operating level. Install vertical to 45 degrees off vertical.
- G. Adjust gages to final angle, clean windows and lenses, and calibrate to zero.
- H. Provide gages on inlet and outlet piping of all pumps, except domestic hot water circulators, and elsewhere as indicated on Drawings.
- I. Locate gages as close as possible to equipment being monitored.

END OF SECTION

**SECTION 22 0719
PLUMBING PIPING INSULATION**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Cellular glass insulation.
- B. Glass fiber insulation.
- C. Piping insulation.
- D. Jacketing and accessories.

1.02 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with not less than three years of documented experience.
- B. Applicator Qualifications: Company specializing in performing the type of work specified in this section with minimum three years of experience.
- C. Insulation specified is intended to set a standard. Insulation by other manufacturers will be considered provided that characteristics meet or exceed specified material. Each substitute item shall be submitted for approval.
- D. Insulating materials shall comply with flame spread, smoke developed, and other applicable requirements of local and state Fire Codes and NFPA 90A, UL 723 or ASTM E-84. Before applying any insulation, submit satisfactory evidence of this compliance.
- E. Installer Qualifications: Insulation contractor installing this insulation system must be experienced with similar type systems and products.
- F. Furnish insulation thickness in excess of that specified herein if so indicated on the drawings.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. Accept materials on site, labeled with manufacturer's identification, product density, and thickness.

1.04 FIELD CONDITIONS

- A. Maintain ambient conditions required by manufacturers of each product.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

- A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84 or UL 723.

2.02 GLASS FIBER INSULATION

- A. Manufacturers:
 - 1. CertainTeed Corporation: www.certainteed.com.
 - 2. Johns Manville Corporation: www.jm.com.
 - 3. Knauf Insulation; Earthwool 1000 Degree Pipe Insulation: www.knaufinsulation.com.
 - 4. Owens Corning Corporation; Fiberglas Pipe Insulation ASJ: www.ocbuildingspec.com.
 - 5. Owens Corning Corporation; VaporWick Pipe Insulation: www.ocbuildingspec.com.
 - 6. Or approved equal.
- B. Insulation: ASTM C547 and ASTM C795; rigid molded, noncombustible.
 - 1. K Value: ASTM C177, 0.24 at 75 degrees F.
 - 2. Maximum Service Temperature: 850 degrees F.
 - 3. Maximum Moisture Absorption: 0.2 percent by volume.

- C. Insulation: ASTM C547 and ASTM C795; rigid molded, noncombustible, with wicking material to transport condensed water to the outside of the system for evaporation to the atmosphere.
 - 1. K Value: ASTM C177, 0.23 at 75 degrees F.
 - 2. Maximum Service Temperature: 220 degrees F.
 - 3. Maximum Moisture Absorption: 0.2 percent by volume.
- D. Insulation: ASTM C547 and ASTM C795; semi-rigid, noncombustible, end grain adhered to jacket.
 - 1. K Value: ASTM C177, 0.24 at 75 degrees F.
 - 2. Maximum Service Temperature: 650 degrees F.
 - 3. Maximum Moisture Absorption: 0.2 percent by volume.
- E. Outdoor Vapor Barrier Mastic: Vinyl emulsion type acrylic or mastic, compatible with insulation, black color.
 - 1. Manufacturers:
 - a. Knauf Insulation.
 - b. Johns Manville.
 - c. Owens Corning Corp.
 - d. Or approved equal.
- F. Outdoor Breather Mastic: Vinyl emulsion type acrylic or mastic, compatible with insulation, black color.
 - 1. Manufacturers:
 - a. Foster Products; Vapor-Safe.
 - b. Childers; Vi-Cryl.
 - c. Eagle Bridges; Sure-Kote.
 - d. Or approved equal.
- G. Insulating Cement: ASTM C449.
 - 1. Manufacturers:
 - a. BNZ Materials, Inc.;
 - b. Ramco; Thermokote.
 - c. Or approved equal.

2.03 CELLULAR GLASS INSULATION

- A. Manufacturers:
 - 1. Pittsburgh Corning Corporation: www.foamglasinsulation.com.
 - 2. Or approved equal.
- B. Insulation: ASTM C552, Type II, Grade 6.
 - 1. Apparent Thermal Conductivity; 'K' Value: Grade 6, 0.35 at 100 degrees F.
 - 2. Service Temperature Range: Up to 800 degrees F.
 - 3. Water Vapor Permeability: 0.005 perm inch maximum per inch.
 - 4. Water Absorption: 0.5 percent by volume, maximum.
- C. Insulation: ASTM C533 and ASTM C795; rigid molded, asbestos free, gold color.
 - 1. 'K' Value: 0.40 at 300 degrees F when tested in accordance with ASTM C177 or ASTM C518.
 - 2. Maximum Service Temperature: 1200 degrees F.
 - 3. Density: 15 lb/cu ft.
- D. Tie Wire: 0.048 inch stainless steel with twisted ends on maximum 12 inch centers.
- E. Insulating Cement: ASTM C449.
 - 1. Manufacturers:
 - a. BNZ Materials.
 - b. Ramco; Thermocote.

- c. K-Flex; 120.
- d. Nomaco; Flextherm.
- e. Armaflex; 520.
- f. Or approved equal.

2.04 JACKETS

- A. Aluminum Jacket: ASTM B209 (ASTM B209M) formed aluminum sheet.
 - 1. Thickness: 0.016 inch sheet.
 - 2. Finish: Smooth.
 - 3. Joining: Longitudinal slip joints and 2 inch laps.
 - 4. Fittings: 0.016 inch thick die shaped fitting covers with factory attached protective liner.
 - 5. Metal Jacket Bands: 3/8 inch wide; 0.015 inch thick aluminum.
 - 6. Metal Jacket Bands: 3/8 inch wide; 0.010 inch thick stainless steel.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that piping has been tested before applying insulation materials.
- B. Verify that surfaces are clean and dry, with foreign material removed.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install in accordance with North American Insulation Manufacturers Association (NAIMA) National Insulation Standards.
- C. Exposed Piping: Locate insulation and cover seams in least visible locations.
- D. Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, pump bodies, and expansion joints.
- E. Glass fiber insulated pipes conveying water:
 - 1. Glass Fiber Insulation:
 - a. Pipe Size Range: 1/2"-1 1/2" inch.
 - b. Thickness: 1" inch.
 - c. Pipe Size: = greater than or equal to 2"
 - d. Thickness: 2"
- F. Pipe Insulation Exposed To Weather
 - 1. Provide aluminum jacket 0.016" thick and smooth. Provide side and end laps of 2" minimum with cut edge of side lap turned under 1" for smooth edge. Seal laps with weatherproof sealant. Position laps to shed water. Secure jacket in place with bands 1/2" x 0.015" thick placed on 9" centers. Extend exterior insulation and jacketing 2" beyond sleeve inside building.
 - 2. All exposed ends of pipe insulation shall be pointed up neatly with appropriate insulating and preformed aluminum end caps.
- G. Inserts and Shields:
 - 1. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts.
 - 2. Insert Location: Between support shield and piping and under the finish jacket.
 - 3. Insert Configuration: Minimum 6 inches long, of same thickness and contour as adjoining insulation; may be factory fabricated.
- H. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations.
- I. Pipe Exposed in Mechanical Equipment Rooms or Finished Spaces (less than 10 feet above finished floor): Finish with canvas jacket sized for finish painting.

- J. Buried Piping: Provide factory fabricated assembly with inner all-purpose service jacket with self-sealing lap, and asphalt impregnated open mesh glass fabric, with one mil thick aluminum foil sandwiched between three layers of bituminous compound; outer surface faced with a polyester film
- K. Heat Traced Piping: Insulate fittings, joints, and valves with insulation of like material, thickness, and finish as adjoining pipe. Size large enough to enclose pipe and heat tracer.
- L. Armaflex Pipe Insulation (If applicable)
 - 1. Apply in accordance with latest edition of Armstrong's "INSTALLATION INSTRUCTIONS TO THE Contractor." Apply two coats of Armstrong's WB Vinyl Finish with color selected by Architect/Engineer.
- M. The application of all insulation shall be performed by experienced mechanics, regularly employed in the trade, in a neat and workmanlike manner. Unless otherwise specified to a greater quality, the application of all insulation shall be in accordance with the manufacturer's recommendations.
- N. Provide semi-circular protection saddles of #16-gage galvanized steel, 12" long, for insulated piping where hangers occur. On pipe sizes 2" and over, provide 12" length of foam-glass insulation at hangers.
- O. Piping systems shall be tested and cleaned before insulation is applied.

END OF SECTION

**SECTION 25 1000
CONTROLS & INSTRUMENTATION**

PART 1- GENERAL

1.01 REQUIREMENTS

- A. The General and Supplementary Conditions and Division 1 govern this Section.
- B. Refer to Division 01 00 00 "General Requirements" for requirements applying to all sections of Division 13 including, but not limited to, the following:
 - 1. Inspection of the Site
 - 2. Verification of Utilities
 - 3. Requirements of Regulatory Agencies
 - 4. Drawings
 - 5. Safety Devices
 - 6. Guarantee

1.02 WORK INCLUDED

- A. Furnish, install and assist in commissioning of the updated Supervisor Control and Data Acquisition (SCADA) System as specified and shown on the contract documents.
- B. Furnish, install and assist in commissioning all equipment and software as specified herein, shown on the contract documents and as required to facilitate a complete and operational system that will function.
- C. Furnish all software as specified herein and as required to facilitate a complete and operational system.
- D. Furnish, install and assist in commissioning all PLC/RTU control panels, PLC equipment to facilitate system operation.
- E. Furnish and install all control, power and communication wiring required to facilitate a complete and operational system in compliance with Electrical Specifications.
- F. Furnish two (2) HMI work stations.
- G. The Contractor shall maintain a complete set of red-lined as-built control diagrams and electrical interlocking diagrams, which include all items controlled by the system at the site and turn over red-lined documents to the Owner's representative at the completion of the project.
- H. Furnish and install one (1) programmable logic controller (PLC) RTU Control Panel for the wastewater system and miscellaneous panel equipment as specified herein and shown on the contract drawings.
- I. Furnish and install current operated switches and transducers on equipment as specified herein or shown on the contract documents.
- J. Furnish and install mounting structures and foundations, and all appurtenances necessary for a complete and functional installation.
- K. Furnish and install fiber optic cable from water treatment plant to wastewater treatment RTU panel.
- L. Furnish and install fiber optic cable from water treatment plant to booster pump RTU panel.
- M. Furnish and install analog surge suppressors in booster pump RTU panel.

1.03 REFERENCE STANDARDS

- A. All work must be performed in accordance with the requirements of the following pertinent standards and legal codes and ordinances:
 - 1. Standard Building Code and Publications referred to therein.
 - 2. Life Safety Code, NFPA No. 101.
 - 3. Occupational Safety and Health Act (OSHA).

4. National Electrical Code (NEC).
5. American National Standards Institute (ANSI).
6. Standards and Periodicals Listings, Underwriters Laboratories.
7. For work not specifically listed above, use the standards and codes of the National Fire Protection Association (NFPA).

1.04 RELATED WORK

- A. Programming of the control system by Gaines, Williams & Associates, Inc. by contract allowance.

1.05 QUALITY ASSURANCE

- A. The Contractor's attention is directed to the fact that all specified instruments and controls must form a completely integrated system and, as such, the instrumentation and control system contractor shall become familiar with requirements necessary to provide equipment specified for the system regardless of manufacturer and shall be responsible to the Contractor for the complete and satisfactory operation of the entire plant instrumentation and control system.
 1. These specifications cover the intended function of the equipment, but do not necessarily cover all details necessary for a complete, operable and functional system. The manufacturer shall supply all devices and appurtenances necessary to provide a complete, operable and satisfactory system as indicated or specified.
- B. Instrumentation and Control System Contractor:
 1. It is the intent of these documents that the Contractor be a qualified Instrumentation and Control System Contractor who shall provide the system as specified and indicated. The system shall be furnished by a single supplier who shall assume all responsibility for providing a complete and integrated system.
 2. The Instrumentation and Control System Contractor shall furnish and install a complete, integrated and functionally operating system, warranted to perform the intended functions as herein specified.
 3. Provide or supply all hardware and software specified herein or required and provide all required and specified collateral services in connection with the system such as testing, calibration, start-up, operation and maintenance manuals without additional cost to the Owner.

1.06 SUBMITTALS

- A. Comply with pertinent provisions of Submittal Procedures Section 01 33 00.
- B. Product data: Within thirty (30) calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
 1. Bill of materials of equipment indicating quantity, manufacturer and model number. Component manufacturing data sheet indicating pertinent data and identifying each component by item number and nomenclature as indicated on the drawings and in the specifications. Include technical data for operator workstations, programmable logic controllers, interface equipment, control units, transducers/transmitters, sensors, relays/switches and radio modem and associated equipment.
 2. Radio site survey.
 3. Instrumentation control element list with element name, type of device, manufacturer, model number.
 4. Component drawing showing dimensions, mounting and external connection details.
- C. Provide Operation and Maintenance manuals:
 1. Special maintenance requirements particular to the system shall be clearly defined along with special calibration and test procedures.
- D. Purchase any and all software packages required for the system in the name of the Owner. All warranties associated with the hardware and software shall be in the name of the Owner. The Owner shall own all development and runtime software.

- E. Provide to Engineer for approval any changes, additions, corrections, etc. required to the Bid Documents that are needed to accommodate the system being proposed. The changes, additions, corrections, etc. shall be at the Contractor's expense and shall be included in his Bid.

1.07 COORDINATION OF WORK

- A. The Instrumentation and Control System Contractor shall be responsible for reviewing the contract documents that could affect this portion of the work.
- B. Specifications, especially instrumentation/electrical and wiring requirements, have been formulated in an attempt to satisfy the conditions for any system proposed. However, a vendor may find that some changes or additional conduit and wiring from that indicated may be required to accommodate particular equipment being proposed. Should this be the case, the vendor shall include in his bid price, all changes or additional requirements necessary for the system. After award of contract, revised drawings must be submitted for approval indicating any changes prior to any changes being implemented.

1.08 PRODUCT DELIVERY, HANDLING AND STORAGE

- A. Comply with pertinent provisions of the contract documents.
- B. Schedule the delivery of the equipment to coordinate with the project completion schedule.
 - 1. Each item of equipment to be tagged with identifying number shown on the Shop Drawings.
- C. Contractor's attention is directed to the fact that equipment has delicate components and extreme care shall be taken in handling to avoid internal and/or external damages.
- D. Damaged, remanufactured and/or used equipment shall not be accepted.
- E. Equipment not for immediate use shall be stored inside a building, with enclosures under protective coverings and shall be fully protected from moisture, extreme heat and vibration.

1.09 WARRANTY

- A. The warranty period shall be defined as One (1) year from date of Notice of Substantial Completion. The warranty shall include all parts and labor for the warranty period, including software updates and installation of software updates.

PART 2 - PRODUCTS

ALL PRODUCTS AND MANUFACTURERS LISTED IN THIS SPECIFICATION ARE ESTABLISHING A BASIS OF DESIGN. OTHER PRODUCTS AND MANUFACTURERS OF EQUAL QUALITY MAY BE SUBMITTED FOR REVIEW AND APPROVAL. THE INTENT IS NOT TO LIMIT PRODUCTS AND MANUFACTURERS USED TO THOSE IDENTIFIED IN THESE SPECIFICATIONS.

2.01 GENERAL

- A. The total control and monitoring system shall consist of a series of individual control and monitoring sub-systems, each configured to perform a specific function associated with the total plant operational scheme. All hardware and software shall be the property of the Owner and licensed to the Owner. No proprietary controllers, input/output modules, equipment of any type and software that can only be purchased from and programmed by the original supplier shall be accepted. All hardware and software shall be off the shelf equipment, no equipment that can only be purchased from or configured by the original integrator shall be accepted. All software, Human Machine Interface (HMI), database, historical data collection, report generation, alarm notification and programmable logic controller programming shall be open protocol and be off the shelf software. No software shall be accepted that can only be purchased from and programmed by the original supplier. The Contractor shall furnish configuration software for any equipment or runtime software supplied that is an approved equal to those specified or listed on control panel bill of materials.

- B. All equipment and materials shall be new, unused and proved by previous use of similar products to be completely suitable for the service intended.
- C. All of the equipment shall be the manufacturer's latest and proven design. Specifications and drawings call attention to certain features but do not purport to cover all details entering into the design of the SCADA system. The completed system shall be compatible with the functions required and other equipment furnished by the Contractor.
- D. All electrical components of the system shall be powered by 120V, single phase, 60 cycle current, except as otherwise indicated or specified.
- E. All contacts for control, remote motor operated, or electrically operated equipment shall be rated not less than 5 amperes on 120V unless otherwise specified herein.
- F. All systems and individual components, whether panel or field mounted units, shall be protected from voltage and/or current surges which may originate as a result of lightning or other external causes.
 - 1. Protective equipment to be provided by the Contractor and installed in accordance with his recommendations.
 - 2. Schematics of the instruments submitted for approval to the Engineer shall indicate how this protection will be provided and identify the items of equipment which shall be used for this purpose.
- G. System manufacturer to supply "as-built" documentation containing all necessary information for proper maintenance and operation of the system.
 - 1. Wire log table showing connections (wire terminations) between all furnished components to be supplied to facilitate field wiring.
 - 2. Interconnection information between system components and equipment found in other sections of these Specifications shall be complete with all necessary interconnection information.
 - 3. Notes which refer to equipment manufacturer's drawings for proper interconnection will not be acceptable.

2.02 AUTOMATIC CONTROL SYSTEM HARDWARE

- A. This Programmable Logic Controller (PLC), Input/Output modules and communication modules Allen-Bradley ControlLogix 1756-L82E and IO for the Main PLC Panel and Micrologix 1400 for Remote Telemetry Units or pre-approved equal GE Fanuc or Siemens programmable logic controllers. If hardware other than Allen-Bradley is furnished the Contractor shall provide programming and configuration software. All programmable logic controllers shall communicate Ethernet IP.
- B. The main water treatment plant programmable logic controllers (PLC) shall be non-proprietary and support a minimum of 175 Ethernet IP nodes, include onboard Ethernet 10/100/1000 Mbps and USB 2.0 ports, 5 MB onboard memory. The main water treatment plant programmable logic controller shall be Allen-Bradley ControlLogix 1756-L82E or pre-approved equal GE Fanuc or Siemens S7. If GE Fanuc RX3i or Siemens S7 PLC equipment is furnished the Contractor shall supply programming and configuration software licensed to the Owner. If PLC other than Allen-Bradley is furnished the Contractor shall provide control panel fabrication drawings and wiring diagrams, original editable bid drawings will not be supplied. All drawings shall be furnished in electronic format in AutoCAD 2019.
- C. The remote telemetry unit (RTU) PLC shall be non-proprietary and include onboard Ethernet IP female RJ45 port, and two (2) serial ports software configurable for DF1, DH-485, Modbus RTU, DNP3 and ASCII communication protocols, integral LCD display indicating IO status, twenty (20) onboard 120 vac digital inputs, twelve (12) onboard relay outputs, support up to seven (7) expansion IO modules and be 120 vac powered. The RTU PLC shall be Allen-Bradley Micrologix 1400 or pre-approved GE Fanuc RX3i or Siemens S7. If GE Fanuc RX3i or Siemens S7 PLC equipment is furnished the Contractor shall supply programming and

configuration software licensed to the Owner. If PLC other than Allen-Bradley is furnished the Contractor shall provide control panel fabrication drawings and wiring diagrams, original editable bid drawings will not be supplied. All drawings shall be furnished in electronic format in AutoCAD 2019.

- D. All PLC equipment shall be of the same manufacturer.
- E. The bid documents are based on equipment listed in the bill of materials on each panel layout drawing, if alternate equipment is furnished the Contractor shall provide control panel fabrication drawings and wiring diagrams, original editable bid documents will not be supplied. All drawings shall be furnished in electronic format in AutoCAD 2019.

2.03 PLANT SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA) SYSTEM

- A. System Description and System Components
 - 1. The HMI project and PLC systems shall have tags that share the same name in each database.
 - 2. The personal computer system running the HMI and alarm notification software packages shall communicate with the PLC's using Ethernet TCP/IP protocol.
- B. All network communications (PLC to PLC, HMI to PLC, PLC/HMI to Equipment) shall be by Ethernet IP, no proprietary networks or communication gateways shall be accepted.
- C. General Control Panel Requirements:
 - 1. All Control and RTU panels shall be shop fabricated per the contract documents and UL508A listed. Equipment shall be furnished exactly as shown on the documents and in Bills of Materials, no exceptions where or approved equal does not appear. The Contractor shall be responsible for layout modifications based on any or equal substitutions. If equipment other than those listed on control panel bills of materials and specified herein is furnished the Contractor shall provide control panel fabrication drawings and wiring diagrams, original editable bid drawings will not be supplied. All drawings shall be furnished in electronic format in AutoCAD 2019.
 - 2. All wiring shall be run in white plastic wire duct with covers.
 - 3. All wiring shall be such that analog signal, AC power and control signals and communications signal are all routed, ducted, bundled or installed in conduit separate raceways. No mixing of services shall be allowed.
 - 4. All analog signal and communications cable shall be 100% shielded.
 - 5. Terminals (excluding ground terminals) shall be high density (maximum 0.25" wide, finger safe, single circuit, multi-rail mount, 600V AC/DC, 30 A and suitable for wire size up to #12 AWG. Terminals for 120 VAC wiring shall be white, 24 VAC wiring shall be gray and 24 VDC shall be blue. Terminals shall be Allen-Bradley No. 1492-J4 or approved equal.
 - 6. Ground terminals shall be single circuit (green/yellow color code) grounding terminal blocks, maximum 0.50" wide, wire size up to #16 AWG and be 35mm DIN rail mount. Terminals shall be Allen-Bradley No. 1492-WG4 or approved equal.
 - 7. Fused terminals shall be single circuit fusible terminal block with neon blown fuse indicator, 300V AC, 15 A, suitable for wire size up to #12 AWG and be 35mm DIN rail mount. Fused terminals shall be Allen-Bradley No. 1492-H4 or approved equal.
 - 8. Circuit Breakers for power circuits shall be single circuit thermal magnetic type, finger safe screw terminal, 277V AC, amp rating as indicated on contract drawings, suitable for wire size up to #6 AWG and be 35mm DIN rail mount. Circuit breakers shall be Allen-Bradley 1492-GH -XXX or approved equal.
 - 9. Circuit Breakers for control circuits shall be single circuit thermal magnetic type, finger safe screw terminal, 250VAC, amp rating as indicated on contract drawings, suitable for wire size up to #10 AWG and be 35mm DIN rail mount. Circuit breakers shall be Allen-Bradley 1492-SP1C-XXX or approved equal.
 - 10. Panel mounted analog IO surge suppressors shall be din rail mountable, single-pair with shield terminal surge suppression modules. The modules shall mount on standard 35mm

- din rail and protect against over-voltage and sneak currents. Analog surge suppressors shall be Allen-Bradley 4983-DD24 or approved equal. All analog IO shall be equipped with surge suppressors at the terminating control panel and field instrument.
11. Line voltage surge suppressors shall protect against over voltage and filter common mode and normal mode noise, have nanosecond reaction time, power line tracking and failure indicator. Line voltage surge suppressors shall be Sola/Hevi-Duty STV25K-10S or approved equal.
 12. Ethernet switches shall be Allen-Bradley/Cisco Stratix 5700 Gigabit switches with full Cisco IOS complete with two (2) single mode fiber optic plugs and two spare copper RJ45 ports. All fiber optic transceivers shall be Gigabit transceivers selected for the appropriate fiber optic cable and distance. The Contractor shall furnish any additional attenuators as required. The Ethernet single mode fiber optic plugs shall be Allen-Bradley 1783-SFP1GLX.
 13. Selector switches shall be 30.5 mm Type 4X, maintained position, watertight and oil tight with standard knob operators and the number of positions required by the Cycles of Control and contract documents. Each switch position shall activate a contact closure dedicated to that position. Selector switches shall be Allen-Bradley 800T or approved equal.
 14. Pushbuttons shall be 30.5 mm Type 4X, momentary spring return, watertight and oil tight with flush head unit. Depressing the switch shall activate contact closure. Button color codes shall be as follows:
 - START: Green
 - STOP: Red
 - All Others: Black
 15. Pilot light units shall be 30.5 mm Type 4/13, 120 VAC LED, water tight and oil tight. Pilot light color code shall be as follows:
 - RUN: Red
 - STOP: Green
 - POWER ON: Amber
 - a. Pilot assemblies shall be Allen-Bradley 800T or approved equal.
 16. Relays shall be 120 VAC, 24 VAC or 24 VDC as required high density terminal block relays with Silver Ox contacts. Relays shall be Allen-Bradley 700-HL or approved equal.
 17. Motor contactors shall be IEC type 3-Pole 120VAC operated, rated for the required motor load and be 35 mm din rail mountable. Contactors shall be Allen-Bradley 100-C or approved equal.
 18. Current sensing switches shall be one-piece single-phase AC current sensor. The unit shall be complete with user selectable adjustments for current sensing mode, trip point and trip delay. Current sensing switches shall be Kele, SSAC, Veris Hawkeye or approved equal.
 19. All plant control panels which contain PLC equipment (processor, IO, etc.) shall include an uninterruptible power supply (UPS). The UPS shall supply 1500 VA minimum and utilize line-interactive technology continually supplying output power filtered from electrical noise and transients while charging battery, output shall be sine wave waveform, buck and boost output voltage by raising or lowering output power, have user replaceable batteries, voltage regulation of +/- 7% RMS, frequency regulation of +/- 0.5 Hz, frequency synchronization rate of +/- 5 Hz and a frequency slew rate of 1 Hz per second. UPS's shall be manufactured by Liebert, Sola or approved equal.
 20. DIN mounting rail shall be symmetrical 35 mm rail. DIN rail shall be Allen-Bradley #1492-DR1 or approved equal.
 21. All enclosures shall be complete with permanently mounted light LED fixture and door switch to energize light when door is opened.

2.04 POWER SUPPLIES

- A. DC power supplies shall be a 120V AC input and 24V DC output, sized for load with twenty-five percent spare capacity, -10°C to 60°C operating temperature range without derating, short circuit protection, over-voltage protection, over-temperature protection, handle high inrush currents without shutdown, high efficient > 90% switching technology, 35mm DIN rail mounting for horizontal or vertical, screw terminals for up to #12 AWG wire, UL508 listed, full CE compliance for safety, emissions and ingress protection and require no internal or external fan cooling. Power supplies shall be Allen-Bradley XLS series or approved equal.

2.05 AUTOMATIC CONTROL SYSTEM HARDWARE

- A. The following computer specifications are a minimum acceptable at time of preparation, it is the intent of this specification that computer equipment be purchased no earlier than eight (8) weeks prior to commencement of startup and commissioning activities. Prior to purchase the Owner will have final review and acceptance of proposed equipment.
1. One (1), Desktop Operator Workstations shall be furnished, workstation shall be Dell OptiPlex 7070 full size case or equal. The workstations shall be complete with the following and at a minimum meet the following specifications:
 - a. Quad-Core Intel Xeon Processor 3.00 GHz.
 - b. Microsoft Windows 10 Professional 64 bit with most current service pack approved by HMI software manufacturer complete with media
 - c. Minimum of 8 GB RAM Memory
 - d. One (1), 1 TB SATA SSHD
 - e. 16 GB graphics accelerator card with dual DVI and HDTV output
 - f. PCIe slot for alarm modem
 - g. Integrated sound card
 - h. Two (2) GB Ethernet network adapters
 - i. Full size tower case, heavy duty power supply 104+ Keyboard, and Mouse.
 - j. Two (2) 24" UltraSharp Flat Panel with DVI input per workstation.
 - k. Dual monitor stand per workstation
 - l. Any special voice modem required for alarm notification software.
 2. One (1), Panel Mount Operator Workstations shall be furnished, workstation shall be Dell OptiPlex 7070 Micro or approved equal. The workstations shall be complete with the following and at a minimum meet the following specifications:
 - a. Intel Core i7-9700T.
 - b. Microsoft Windows 10 Professional 64 bit with most current service pack approved by HMI software manufacturer complete with media
 - c. Minimum of 8 GB RAM Memory
 - d. One (1), M.2 256GB PCIe NVMe Class 40 Solid State Drive
 - e. 16 GB graphics accelerator card with dual DVI and HDTV output
 - f. Integrated sound card
 - g. One (1) GB Ethernet network adapters
 - h. Micro size tower case, heavy duty power supply 104+ Keyboard, and Mouse.
 - i. One (1) 17" Hope Industrial Systems panel mount monitor.
 - j. One (1) PC wall mount bracket kit for mounting of the Micro PC to inside of SCADA panel door.
 3. One (1) 17" Hope Industrial Systems panel mount touch screen monitor, 120VAC power, resistive touch screen complete with all cables necessary for connection with computer. Monitor shall be Hope Industrial Systems HIS-ML17-STAH.

2.06 UNINTERRUPTIBLE POWER SUPPLY (UPS) SYSTEM

- A. For each computer system provide one (1) Uninterruptible Power Supply (UPS) System to provide transient protection and backup AC power. The UPS system shall provide true online

power protection to prevent any break in power. The UPS system shall provide continuous, clean sine wave power for a period of at least 15 minutes after loss of commercial power. The unit shall also provide brownout protection to boost sags in AC power.

- B. The UPS system shall be UL 1449 listed for surge protection with a mean time between failure of at least 100,000 hours. The unit shall have passed ANSI/IEEE C62.41 Categories A and B. RF noise isolation shall be accomplished using a full-time advanced multi-stage filter. Noise (RF) Isolation shall not exceed 60 dB common-mode or 80 dB normal-mode.
- C. The UPS shall be sized for a minimum capacity of 1500 VA
- D. The UPS system shall be manufactured by APC, Liebert or Sola.

2.07 INTERCONNECTING CABLES

- A. The Instrumentation and Control System Contractor shall furnish all cables required for interconnections between the computer system and all peripherals.
- B. The Instrumentation and Control System Contractor shall furnish all Ethernet cables and all associated fiber optics cables and parts including WIC fiber optics cable interface boxes, fiber optics connectors, fiber optics cable termination kits, etc.

2.08 BACKUP SYSTEM

- A. Furnish and install one stand-alone external HDD backup system complete with 5 TB of storage complete with AutoBackup software.

2.09 AUTOMATIC CONTROL SYSTEM SOFTWARE

- A. The Contractor shall furnish and install the following software. During commissioning of the system, the Contractor shall transmit through the Engineer all master diskettes and manuals. The Contractor shall transfer registration of all software to the Owner. Upon substantial completion the Owner shall have the latest available release of the following software packages:
 - 1. Two (2) license of HMI runtime software Wonderware InTouch software, 3000 tag, Wonderware InTouch as an update of the existing HMI software. HMI Software shall be complete with all communication software/servers required for communication services.
 - 2. One (1) license of WIN-911 Advanced with Dialogic D/4PCI:D/4PCIUFEQ telephony voice modem.

2.10 ELECTRICAL CONTROL WIRING

- A. All field wiring shall comply with National Electrical Code and Division 26 "Electrical".
- B. All wiring (control, power and communication) shall be furnished and installed by this Division.
- C. All wiring shall be in conduit as specified in Division 26 "Electrical".
- D. Copper Ethernet cable shall be Category 6, 24 AWG solid bare copper, polyolefin insulated, 4 twisted pairs, overall shield, 23 AWG stranded tinned copper drain wire. PVC jacket sequentially marked at two-foot intervals.
- E. Single pair analog cable shall be tinned copper, polyethylene insulated, twisted pair with 100% aluminum-polyester shield coverage, 18 AWG stranded tinned copper drain wire and chrome PVC jacket. Cable shall be Belden 8760 or approved equal.
- F. Discrete copper internal control panel shall be UL rated Type E-16 single conductor stranded silver plated copper with extruded TFE Teflon insulation. Wire shall be suitable for operation 600 volts as specified in the National Electric Code, at conductor temperatures not to exceed 200°C. Wire shall be resistant to acid, alkalis, oil, flame, moisture, solvents and fungus. Wire color code shall be as follow:
 - Black - 24 and 120 VAC power
 - White - 24 and 120 VAC neutral
 - Green - Ground

- Red - 24 and 120 VAC PLC input wiring
 - Orange - 24 and 120 VAC PLC output wiring
 - Blue - 24 VDC positive
 - White/Blue Strip - 24 VDC negative
 - Yellow - Circuit conductors which remain energized when supply disconnecting means is off.
- Field control wiring shall match the above color code.

2.11 ELECTRIC/ELECTRONIC INPUT DEVICES

- A. The system shall maintain the specified analog end-to-end accuracy throughout the warranty period from sensor to controller readout.
- B. Sensors (transducers) shall be appropriately packaged for the location.
 - 1. Architectural housing for space mounting
 - 2. Weatherproof/sunshield housing for outdoors.
 - 3. Thermal well housing for water applications.
 - 4. Protective housing for duct mounting.
- C. The sensor/transducer shall be selected to withstand ambient conditions where:
 - 1. Moisture or condensation is a factor.
 - 2. Vibration exists from ductwork, equipment, etc.
 - 3. Reasonably expected transient conditions exist for temperatures, pressures, humidities, etc. outside the normal sensing range.
- D. The sensor/transducer will be appropriately selected to most closely match the expected sensing range.

2.12 ELECTRIC/ELECTRONIC OUTPUT DEVICES

- A. Three-Mode relay control modules shall be provided at the motor control station(s) for Hand/Off/Auto control where remote control is called for in sequence of control.

PART 3 - EXECUTION

3.01 GENERAL REQUIREMENTS

- A. Refer to Section 13010, "General Requirements - Controls & Instrumentation" for requirements applying to all sections of Division 13 including, but not limited to, the following:
 - 1. Coordination
 - 2. Workmanship, Materials and Equipment
 - 3. Manufacturer's Recommendations
 - 4. Protection of Work
 - 5. Utility Connections
 - 6. Patching
 - 7. Painting and Identification
 - 8. Adjustments
 - 9. Contractors Test and Balance
 - 10. Clean-Up

3.02 ENCLOSURES

- A. For all input/output devices which require field interface devices, these devices where practical will be mounted in a local control/field interface panel (LC/FIP). All other field interface devices will be mounted at the point of field interface in a separate enclosure suitable for the location. The Contractor shall provide an enclosure which protects the device (s) from dust, moisture, conceals integral wiring and moving parts.
- B. All wiring to and from the LC/FIP will be to screw type terminals. Analog or communications wiring may use the FIP as a raceway without terminating. The use of wire nuts within the FIP is prohibited.

- C. All wiring within LC/FIP's will be run in plastic raceway to give a neat and workmanlike appearance.
- D. Each panel shall be complete with a half-size set of as-built control drawings for the panel, include loop drawings for all instruments associated with the panel.

3.03 FIELD DEVICE IDENTIFICATION

- A. All I/O field devices (except space sensors) that are not mounted within FIP's shall be identified with stainless steel engraved name plates.
- B. The identification shall match instrument tags in the contract documents.
- C. Calibration settings shall be marked with paint or indelible ink.
- D. Each terminal strip termination shall be tagged with an identification that matches the control drawings.
- E. The outside of each LC/FIP shall be identified with an engraved plastic label matching the identification name shown on the control drawings prepared by the Contractor. The lettering shall be in white against a black background.

3.04 MARKING

- A. Each control component shall be plainly and permanently marked with the number or symbol as it appears on the control diagram on an engraved stainless-steel tag furnished by the manufacturer.
- B. Where one control diagram serves more than one system additionally identify with system number.
- C. Junction box covers will be marked to indicate that they are a part of the control system.

3.05 IDENTIFICATION

- A. All control wires and cables shall be labeled. Wire, cable, terminal and fuse labels shall consist of the complete wire number matching exactly the number shown on the control wiring diagrams, custom printed on a single pressure sensitive, self-adhesive tape which wraps the entire circumference of the wire or cable. Hand writing or combining multiple labels to make the number shall not be permitted.

3.06 OPERATING AND MAINTENANCE INSTRUCTIONS

- A. Furnish three (3) copies of operating and maintenance instructions.
- B. Furnish three (3) electronic (AutoCAD 2019 and Adobe PDF) sets, full size and half size printed sets of as-built control drawings.

3.07 SYSTEM TEST AND STARTUP

- A. The contractor shall provide staff onsite to work with Integrator/Engineer to verify each field instrument wiring termination.

END OF SECTION

**SECTION 26 3213
ENGINE GENERATORS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Packaged engine generator system and associated components and accessories:
 - 1. Engine and engine accessory equipment.
 - 2. Alternator (generator).
 - 3. Generator set control system.
 - 4. Generator set enclosure.

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Concrete equipment pads.
- B. Section 26 3600 - Transfer Switches.

1.03 REFERENCE STANDARDS

- A. ASTM D975 - Standard Specification for Diesel Fuel; 2023a.
- B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
- C. NECA/EGSA 404 - Standard for Installing Generator Sets; 2014.
- D. NEMA MG 1 - Motors and Generators; 2021.
- E. NFPA 99 - Health Care Facilities Code; 2024.
- F. NFPA 110 - Standard for Emergency and Standby Power Systems; 2022.
- G. UL 1236 - Battery Chargers for Charging Engine-Starter Batteries; Current Edition, Including All Revisions.
- H. UL 2200 - Stationary Engine Generator Assemblies; Current Edition, Including All Revisions.
- I. CSA 282.
- J. CSA 100
- K. EN61000-6
- L. EN55011.
- M. FCC Part 15, Subpart B.
- N. ISO8528.
- O. IEC61000.
- P. UL 508.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate compatibility of generator sets to be installed with work provided under other sections or by others.
 - a. Transfer Switches: See Section 26 3600.
 - 2. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment or other potential obstructions within the spaces dedicated for engine generator system.
 - 3. Coordinate arrangement of equipment with the dimensions and clearance requirements of the actual equipment to be installed.
 - 4. Coordinate the work to provide electrical circuits suitable for the power requirements of the actual auxiliary equipment and accessories to be installed.
 - 5. Notify Engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

- B. Preinstallation Meeting: Convene one week before starting work of this section; require attendance of all affected installers.

1.05 SUBMITTALS

- A. Product Data: Provide manufacturer's standard catalog pages and data sheets for each product, including ratings, configurations, dimensions, finishes, weights, service condition requirements, and installed features. Include alternator starting capabilities, engine fuel consumption rates, and cooling, combustion air, and exhaust requirements.
 - 1. Include generator set sound level test data.
 - 2. Include characteristic trip curves for overcurrent protective devices upon request.
 - 3. Include alternator thermal damage curve upon request.
- B. Shop Drawings: Include dimensioned plan views and sections indicating locations of system components, required clearances, and field connection locations. Include system interconnection schematic diagrams showing all factory and field connections.
- C. Derating Calculations: Indicate ratings adjusted for applicable service conditions.
- D. Fuel Storage Tank Calculations: Indicate maximum running time for generator set configuration provided.
- E. Specimen Warranty: Submit sample of manufacturer's warranty.
- F. Evidence of qualifications for installer.
- G. Evidence of qualifications for maintenance contractor (if different entity from installer).
- H. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and operation of product.
- I. Manufacturer's factory emissions certification.
- J. Manufacturer's certification that products meet or exceed specified requirements.
- K. Source quality control test reports.
- L. Provide NFPA 110 required documentation from manufacturer where requested by authorities having jurisdiction, including but not limited to:
 - 1. Certified prototype tests.
 - 2. Torsional vibration compatibility certification.
 - 3. NFPA 110 compliance certification.
 - 4. Certified rated load test at rated power factor.
- M. Manufacturer's detailed field testing procedures.
- N. Field quality control test reports.
- O. Operation and Maintenance Data: Include detailed information on system operation, equipment programming and setup, replacement parts, and recommended maintenance procedures and intervals.
 - 1. Include contact information for entity that will be providing contract maintenance and trouble call-back service.
- P. Executed Warranty: Submit documentation of final executed warranty completed in Owner's name and registered with manufacturer.
- Q. Maintenance contracts.
- R. Project Record Documents: Record actual locations of system components, installed circuiting arrangements and routing, and final equipment settings.
- S. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. Extra Fuses: One of each type and size.
 - 2. Extra Filter Elements: One of each type, including fuel, oil and air.

- T. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
- U. Engine-generator submittals shall include the following information:
 - 1. Factory published specification sheet.
 - 2. Manufacturer's catalog cut sheets of all auxiliary components such as battery charger, control panel, enclosure, etc.
 - 3. Dimensional elevation and layout drawings of the generator set, enclosure and transfer switchgear and related accessories.
 - 4. Weights of all equipment.
 - 5. Concrete pad recommendation, layout and stub-up locations of electrical and fuel systems.
 - 6. Interconnect wiring diagram of complete emergency system, including generator, switchgear, day tank, remote pumps, battery charger, control panel, and remote alarm indications.
 - 7. Engine mechanical data, including heat rejection, exhaust gas flows, combustion air and ventilation air flows, fuel consumption, etc.
 - 8. Generator electrical data including temperature and insulation data, cooling requirements, excitation ratings, voltage regulation, voltage regulator, efficiencies, waveform distortion and telephone influence factor.
 - 9. Generator resistances, reactances and time constants.
 - 10. Generator locked rotor motor starting curves.
 - 11. Manufacturer's documentation showing maximum expected transient voltage and frequency dips, and recovery time during operation of the generator set at the specified site conditions with the specified loads.
 - 12. Manufacturer's and dealer's written warranty.
 - 13. Prototype test documents are acceptable except that transient voltage, frequency dips, and recovery time during operation shall be for the furnished generator with load bank at least 95% or rating.

1.06 SUBSTITUTION

- A. Proposed deviations from the specifications shall be treated as follows:
 - 1. Substitution Responsibility
 - a. The equipment sizing, spacing, amounts, electrical wiring, ventilation equipment, fuel, and exhaust components have all been sized and designed around GENERAC supplied equipment as a Basis of Design. Equipment manufactured by KOHLER, CATERPILLAR, CUMMINS, or Architect/Engineer approved equal will be considered providing the deviations from the listed specification are listed and included with the bidding documents. Deviations will not be permitted to environmental and seismic requirements. Should any substitutions be made, the Contractor shall bear responsibility for the installation, coordination and operation of the system as well as any engineering and redesign costs, which may result from such substitutions.

1.07 QUALITY ASSURANCE

- A. Maintain at the project site a copy of each referenced document that prescribes execution requirements.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
 - 1. Authorized service facilities located within 200 miles of project site.
- C. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience with engine generator systems of similar size, type, and complexity; manufacturer's authorized installer.
- D. Maintenance Contractor Qualifications: Same entity as installer or different entity with specified qualifications.

1. Contract maintenance office located within 200 miles of project site.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store generator sets in accordance with manufacturer's instructions and NECA/EGSA 404.
- B. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
- C. Handle carefully in accordance with manufacturer's instructions to avoid damage to generator set components, enclosure, and finish.

1.09 FIELD CONDITIONS

- A. Maintain field conditions within manufacturer's required service conditions during and after installation.

1.10 WARRANTY

- A. Provide minimum two year manufacturer warranty covering repair or replacement due to defective materials or workmanship.
- B. Two Year Standby (ISO 8528-1: ESP) Generator Set Warranty
 1. The manufacturer's standard warranty shall in no event be for a period of less than two (2) years from date of initial start-up of the system and shall include repair parts, labor, reasonable travel expense necessary for repairs at the job site, and expendables (lubricating oil, filters, antifreeze, and other service items made unusable by the defect) used during the course of repair. Running hours shall be limited to 500 hours annually for the system warranty by both the manufacturer and servicing distributor. Submittals received without written warranties as specified will be rejected in their entirety.

1.11 WORK INCLUDED

- A. Installation
 1. The work includes supplying and installing a complete integrated generator system. The system consists of a diesel generator set with related component accessories and automatic transfer switches specified under this section or a separate section.
- B. Fuel System
 1. The CONTRACTOR shall provide a full tank of diesel fuel for the completion of all testing.
- C. System Test
 1. A complete system load test shall be performed after all equipment is installed. Guidelines in the Start-up Section.
- D. The generator set must be pre-certified to meet EPA federal emission requirements for stationary standby. Documentation of EPA certification for the specific generator provided shall be submitted. On-site emission testing & certification will not be acceptable for standby applications.
- E. The generator manufacturer shall provide filled out draft Tennessee Department of Environment and Conservation (TDEC) permit application forms for Owner signature as follows: APC 100 Location, Construction and Operating information; APC-102 Fuel Burning Source Description; APC-101 Emission Point Description . Respond and comply with requirements of the applications that impact the equipment.

1.12 SYSTEM RESPONSIBILITY

- A. Generator Set Distributor
 1. The completed engine generator set shall be supplied by the Manufacturer's authorized distributor only.
- B. Requirements, Codes and Regulations

1. All equipment shall be new, of current production. There shall be one source responsibility for warranty; parts and service through a local representative with factory trained service personnel.

1.13 QUALIFICATIONS

- A. The manufacturer of the assembly shall be the manufacturer of the major components within the assembly.
- B. For the equipment specified herein, the manufacturer shall be ISO 9001 or 9002 certified.
- C. The manufacturer of this equipment shall have produced similar electrical equipment for a minimum period of five (5) years. When requested by the Engineer, an acceptable list of installations with similar equipment shall be provided demonstrating compliance with this requirement.
 1. Provide Seismic qualified equipment based upon applicable seismic requirements of the International Building code with seismic values as indicated on Sheet S0.1. The following minimum mounting and installation guidelines shall be met, unless specifically modified by the above referenced standards.
 - a. The Contractor shall provide equipment anchorage details, coordinated with the equipment mounting provision, prepared and stamped by a licensed civil/structural engineer in the state of the project. Mounting recommendations shall be provided by the manufacturer based upon the above criteria to verify the seismic design of the equipment.
 - b. The equipment manufacturer shall certify that the equipment can withstand, that is, function following the seismic event, including both vertical and lateral required response spectra as specified in above codes.
 2. The equipment manufacturer shall document the requirements necessary for proper seismic mounting of the equipment. Seismic qualification shall be considered achieved when the capability of the equipment, meets or exceeds the specified response spectra.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Genset Requirements
 1. The generator set shall be Standby Duty rated at running kw standby, RPM, volts, 3 phase, including radiator fan and all parasitic loads. Generator set shall be sized to operate at the specified load at a maximum ambient of 95°F (35.0°C) and altitude of 500.0 feet (152.4 m).
- B. Fuel/Emissions strategy shall be EPA Tier 3 or as required on Date of Bid Opening.
- C. All materials and parts comprising the unit shall be new and unused.
- D. Engine
 1. The engine shall be diesel fueled, four (4) cycle, water-cooled, while operating with nominal speed not exceeding 1800 RPM. The engine will utilize in-cylinder combustion technology, as required, to meet applicable EPA non-road mobile regulations and/or the EPA NSPS rule for stationary reciprocating compression ignition engines. Additionally, the engine shall comply with the State Emission regulations at the time of installation/commissioning. Actual engine emissions values must be in compliance with applicable EPA emissions standards per ISO 8178 - D2 Emissions Cycle at specified kW/bHP rating. Utilization of the "Transition Program for Equipment Manufacturers" (also known as "Flex Credits") to achieve EPA certification is not acceptable. The in-cylinder engine technology must not permit unfiltered exhaust gas to be introduced into the combustion cylinder. Emissions requirements / certifications of this package: LOW BSFC.
 2. Engine Governing
 - a. The engine will be equipped with an isochronous electronic governor to maintain +/- 6 RPM steady state frequency variation from steady state no load to steady state full

load.

2.02 MANUFACTURERS

- A. Packaged Engine Generator Set - Basis of Design: Generac Power Systems.
- B. Packaged Engine Generator Set - Other Acceptable Manufacturers:
 - 1. Caterpillar Inc: www.cat.com.
 - 2. Cummins Power Generation Inc: www.cumminspower.com.
 - 3. Kohler Co: www.kohlerpower.com.
 - 4. Approved equal.
- C. Source Limitations: Furnish engine generator sets and associated components and accessories produced by a single manufacturer and obtained from a single supplier.

2.03 PACKAGED ENGINE GENERATOR SYSTEM

- A. Packaged Engine Generator Set:
 - 1. Type: Diesel (compression ignition).
 - 2. Power Rating: 100 kW, standby.
 - 3. Voltage: As indicated on drawings.
 - 4. Main Line Circuit Breaker: quantity as indicated on the drawings.
 - a. Type: Electronic trip with long time and short time delay and instantaneous pickup.
 - b. Trip Rating: Select according to generator set rating.
 - c. Features:
 - 1) Shunt trip.
 - 2) Auxiliary contacts.
- B. Generator Set General Requirements:
 - 1. Prototype tested in accordance with NFPA 110 for Level 1 systems.
 - 2. Factory-assembled, with components mounted on suitable base.
 - 3. List and label engine generator assembly as complying with UL 2200.
 - 4. Power Factor: Unless otherwise indicated, specified power ratings are at 0.8 power factor for three phase voltages and 1.0 power factor for single phase voltages.
 - 5. Provide suitable guards to protect personnel from accidental contact with rotating parts, hot piping, and other potential sources of injury.
 - 6. Main Line Circuit Breakers: Provide factory-installed line side connections with suitable lugs for load side connections.
- C. Service Conditions: Provide engine generator system and associated components suitable for operation under the service conditions at the installed location.
- D. Starting and Load Acceptance Requirements:
 - 1. Cranking Method: Cycle cranking complying with NFPA 110 (15 second crank period, followed by 15 second rest period, with cranking limiter time-out after 3 cycles), unless otherwise required.
 - 2. Cranking Limiter Time-Out: If generator set fails to start after specified cranking period, indicate overcrank alarm condition and lock-out generator set from further cranking until manually reset.
 - 3. Start Time: Capable of starting and achieving conditions necessary for load acceptance within 10 seconds (NFPA 110, Type 10).
 - 4. Maximum Load Step: Supports 100 percent of rated load in one step.
 - 5. Motor Starter Capability: Sustained voltage dip data is not acceptable. Provide locked rotor motor starting capability of KVA at 1.75 x rated at 30% instantaneous voltage dips as defined per NEMA MG 1.
- E. Exhaust Emissions Requirements:
 - 1. Comply with federal (EPA), state, and local regulations applicable at the time of commissioning; include factory emissions certification with submittals.

2. Do not make modifications affecting generator set factory emissions certification without approval of manufacturer and Engineer. Where such modifications are made, provide field emissions testing as necessary for certification.

2.04 ENGINE AND ENGINE ACCESSORY EQUIPMENT

- A. Provide engine with adequate horsepower to achieve specified power output at rated speed, accounting for alternator efficiency and parasitic loads.
- B. Engine Fuel System - Diesel (Compression Ignition):
 1. Fuel Source: Diesel, ASTM D975 No. 2-D or approved cold weather diesel blends.
 2. Engine Fuel Supply: Provide engine-driven, positive displacement fuel pump with replaceable fuel filter(s), water separator, check valve to secure prime, manual fuel priming pump, and relief-bypass valve. Provide fuel cooler where recommended by manufacturer.
 3. Engine Fuel Connections: Provide suitable, approved flexible fuel lines for coupling engine to fuel source.
 4. The fuel system shall be integral with the engine. In addition to the standard fuel filters provided by the engine manufacturer, there shall also be installed a primary fuel filter/water separator in the fuel inlet line to the engine. All fuel piping shall be black iron or flexible fuel hose rated for this service. No galvanized piping will be permitted. Flexible fuel lines shall be minimally rated for 300 degrees F and 100 psi.
 5. Fuel Sub Base Tank
 - a. Provide a double wall sub-base tank constructed to meet all local codes and requirements. A fuel tank base of 48 hour capacity shall be provided as an integral part of the enclosure. It shall be contained in a rupture basin with 110% capacity. The tank shall meet UL142 standards. A locking fill cap, a mechanical reading fuel level gauge, low fuel level alarm contact, and fuel tank rupture alarm contact shall be provided. Fill pipe shall be extended to the enclosure side accessible to vehicles with cap accessible without opening enclosure.
 - b. Alarm Indications/Shutdowns:
 - 1) Low fuel level alarm; provides local indication and activates remote output contact.
 - 2) Critical low fuel level alarm; provides local indication and activates remote output contact; can be configured to shut down engine to prevent loss of fuel prime.
 - 3) High fuel level; provides local indication and activates remote output contact.
 - 4) Critical high fuel level alarm; provides local indication and activates remote output contact; shuts down fuel transfer supply pump.
 - 5) Secondary containment leak detection alarm; provides local indication and activates remote output contact; shuts down fuel transfer supply pump.
 6. Sub-Base Fuel Tank:
 - a. Features:
 - 1) Direct reading fuel level gauge.
 - 2) Normal atmospheric vent.
 - 3) Emergency pressure relief vent.
 - 4) Fuel fill opening with lockable cap.
 - 5) Dedicated electrical conduit stub-up area.
 - 6) Low fuel level switch.
 - 7) Leak detection switch; located within secondary containment interstitial space for detection of primary tank fuel leak.
- C. Engine Fuel System - Gaseous (Spark Ignition):
 1. Fuel Source: Natural gas.
 2. Engine Fuel Connections: Provide suitable, approved flexible fuel lines for coupling engine to fuel source.

3. Provide components/features indicated and as necessary for operation and/or required by applicable codes, including but not limited to:
 - a. Carburetor.
 - b. Gas pressure regulators.
 - c. Fuel shutoff control valves.
 - d. Low gas pressure switches.
- D. Engine Starting System:
 1. System Type: Electric, with DC solenoid-activated starting motor(s).
 2. Battery(s):
 - a. Battery Type: Lead-acid.
 - b. Battery Capacity: Size according to manufacturer's recommendations for achieving starting and load acceptance requirements under worst case ambient temperature; capable of providing cranking through two complete periods of cranking limiter time-outs without recharging.
 - c. Provide battery rack, cables, and connectors suitable for the supplied battery(s); size battery cables according to manufacturer's recommendations for cable length to be installed.
 3. Battery-Charging Alternator: Engine-driven, with integral solid-state voltage regulation.
 4. Battery Charger:
 - a. Provide dual rate battery charger with automatic float and equalize charging modes and minimum rating of 10 amps; suitable for maintaining the supplied battery(s) at full charge without manual intervention.
 - b. Capable of returning supplied battery(s) from fully discharged to fully charged condition within 24 hours, as required by NFPA 110 for Level 1 applications while carrying normal loads.
 - c. Recognized as complying with UL 1236.
 - d. Furnished with integral overcurrent protection; current limited to protect charger during engine cranking; reverse polarity protection.
 - e. Provide integral DC output ammeter and voltmeter with five percent accuracy.
 - f. Provide alarm output contacts as necessary for alarm indications.
- E. Engine Speed Control System (Governor):
 1. Single Engine Generator Sets (Not Operated in Parallel): Provide electronic isochronous governor for controlling engine speed/alternator frequency.
 2. Frequency Regulation, Electronic Isochronous Governors: No change in frequency from no load to full load; plus/minus 0.25 percent at steady state.
- F. Engine Lubrication System:
 1. System Type: Full pressure, with engine-driven, positive displacement lubrication oil pump, replaceable full-flow oil filter(s), and dip-stick for oil level indication. Provide oil cooler where recommended by manufacturer.
- G. Engine Cooling System:
 1. System Type: Closed-loop, liquid-cooled, with unit-mounted radiator/fan and engine-driven coolant pump; suitable for providing adequate cooling while operating at full load under worst case ambient temperature.
 2. Fan Guard: Provide suitable guard to protect personnel from accidental contact with fan.
 3. Ducted Radiators: Where ducted radiator air discharge is to be field-installed, provide suitable radiator duct flange/adapter.
 4. Coolant Heater: Provide thermostatically controlled coolant heater to improve starting under cold ambient conditions; size according to manufacturer's recommendations for achieving starting and load acceptance requirements under worst case ambient temperature.
- H. Engine Air Intake and Exhaust System:

1. Air Intake Filtration: Provide engine-mounted, replaceable, dry element filter.
2. Engine Exhaust Connection: Provide suitable, approved flexible connector for coupling engine to exhaust system.
3. Exhaust Silencer: Provide critical grade or better exhaust silencer with sound attenuation not less than basis of design; select according to manufacturer's recommendations to meet sound performance requirements, where specified.

2.05 ALTERNATOR (GENERATOR)

- A. Alternator: 3-pole, 1800 rpm (60 Hz output) revolving field, synchronous generator complying with NEMA MG 1; connected to engine with flexible coupling; voltage output configuration as indicated, with reconnectable leads for 3 phase alternators.
- B. Exciter:
 1. Exciter Type: Brushless; provide permanent magnet generator (PMG) excitation system; self-excited (shunt) systems are not permitted.
 2. PMG Excitation Short-Circuit Current Support: Capable of sustaining 300 percent of rated output current for 10 seconds.
 3. The automatic voltage regulator (AVR) shall maintain generator output voltage within +/- 0.5% for any constant load between no load and full load. The regulator shall be a totally solid state design, which includes electronic voltage buildup, volts per Hertz regulation, over-excitation protection, shall limit voltage overshoot on startup, and shall be environmentally sealed.
- C. Temperature Rise: Comply with UL 2200.
- D. Insulation System: NEMA MG 1, Class H; suitable for alternator temperature rise.
- E. Enclosure: NEMA MG 1, drip-proof.
- F. Total Harmonic Distortion: Not greater than five percent.

2.06 GENERATOR SET CONTROL SYSTEM

- A. Provide a fully solid-state, microprocessor based, generator set control. The control panel shall be designed and built by the engine manufacturer. The control shall provide all operating, monitoring, and control functions for the generator set. The control panel shall provide real time digital communications to all engine and regulator controls via SAE J1939.
- B. Environmental
 1. The generator set control shall be tested and certified to the following environmental conditions.
 - a. -40°C to +70°C Operating Range.
 - b. 95% humidity non-condensing, 30°C to 60°C.
 - c. IP22 protection for rear of controller; IP55 when installed in control panel.
 - d. 5% salt spray, 48 hours, +38°C, 36.8V system voltage.
 - e. Sinusoidal vibration 4.3G's RMS, 24-1000Hz.
 - f. Electromagnetic Capability (89/336/EEC, 91/368/EEC, 93/44/EEC, 93/68/EEC, BS EN 50081-2, 50082-2).
 - g. Shock: withstand 15G.
- C. Functional Requirements
 1. The following functionality shall be integral to the control panel.
 - a. The control shall include a 33 x 132 pixel, 24mm x 95mm, positive image, transfective LCD display with text based alarm/event descriptions.
 - b. Audible horn for alarm and shutdown with horn silence switch.
 - c. Standard ISO labeling.
 - d. Multiple language capability.
 - e. Remote start/stop control.
 - f. Local run/off/auto control integral to system microprocessor.

- g. Cooldown timer.
 - h. Speed adjust.
 - i. Lamp test.
 - j. Push button emergency stop button.
 - k. Password protected system programming.
- D. Control Panel:
1. Control Panel Mounting: Unit-mounted unless otherwise indicated; vibration isolated.
 2. Generator Set Control Functions:
 - a. Automatic Mode: Initiates generator set start/shutdown upon receiving corresponding signal from remote device (e.g. automatic transfer switch).
 - b. Manual Mode: Initiates generator set start/shutdown upon direction from operator.
 - c. Reset Mode: Clears all faults, allowing generator set restart after a shutdown.
 - d. Emergency Stop: Immediately shuts down generator set (without time delay) and prevents automatic restarting until manually reset.
 - e. Cycle Cranking: Programmable crank time, rest time, and number of cycles.
 - f. Time Delay: Programmable for shutdown (engine cooldown) and start (engine warmup).
 - g. Voltage Adjustment: Adjustable through range of plus/minus 5 percent.
 - h. h. All read-outs to be in English units.
 3. Generator Set Status Indications:
 - a. Voltage (Volts AC): Line-to-line, line-to-neutral for each phase.
 - b. Current (Amps): For each phase.
 - c. Frequency (Hz).
 - d. Real power (W/kW).
 - e. Reactive power (VAR/kVAR).
 - f. Apparent power (VA/kVA).
 - g. Power factor.
 - h. Duty Level: Actual load as percentage of rated power.
 - i. Engine speed (RPM).
 - j. Battery voltage (Volts DC).
 - k. Engine oil pressure.
 - l. Engine coolant temperature.
 - m. Engine run time.
 - n. Generator powering load (position signal from transfer switch).
 4. Generator Set Protection and Warning/Shutdown Indications: The control shall monitor and provide alarm indication and subsequent shutdown for the following conditions. All alarms and shutdowns are accompanied by a time, date, and engine hour stamp that are stored by the control panel for first and last occurrence:
 - a. Comply with NFPA 110; configurable for NFPA 110 Level 1 or Level 2, or NFPA 99 systems including but not limited to the following protections/indications:
 - 1) Overcrank (shutdown).
 - 2) Low coolant temperature (warning).
 - 3) High coolant temperature (warning).
 - 4) High coolant temperature (shutdown).
 - 5) Low oil pressure (warning).
 - 6) Low oil pressure (shutdown).
 - 7) Overspeed (shutdown).
 - 8) Low fuel level (warning).
 - 9) Low coolant level (warning/shutdown).
 - 10) Generator control not in automatic mode (warning).
 - 11) High battery voltage (warning).

- 12) Low cranking voltage (warning).
- 13) Low battery voltage (warning).
- 14) Battery charger failure (warning).
- 15) Control switch not in auto position alarm.
- b. In addition to NFPA 110 requirements, provide the following protections/indications:
 - 1) High AC voltage (shutdown).
 - 2) Low AC voltage (shutdown).
 - 3) High frequency (shutdown).
 - 4) Low frequency (shutdown).
 - 5) Overcurrent (shutdown).
 - 6) Fuel tank leak (warning), where applicable.
- c. Provide contacts for local and remote common alarm.
- d. Provide lamp test function that illuminates all indicator lamps.
5. Other Control Panel Features:
 - a. Event log.
 - b. Communications Capability: Compatible with system indicated. Provide all accessories necessary for proper interface.
 - c. Remote monitoring capability via PC.
- E. Remote Annunciator:
 1. Remote Annunciator Mounting: Wall-mounted; Provide flush-mounted annunciator for finished areas and surface-mounted annunciator for non-finished areas unless otherwise indicated.
 - a. The annunciator shall provide remote annunciation of all points stated below and shall incorporate ring-back capability so that after silencing the initial alarm, any subsequent alarms will sound the horn.
 - b. Ability to be located up to 800 feet from the generator set.
 2. Generator Set Status Indications:
 - a. Generator powering load (via position signal from transfer switch).
 - b. Communication functional.
 3. Generator Set Warning/Shutdown Indications:
 - a. Comply with NFPA 110; configurable for NFPA 110 Level 1 or Level 2, or NFPA 99 systems including but not limited to the following indications:
 - 1) Overcrank (shutdown).
 - 2) Low coolant temperature (warning).
 - 3) High coolant temperature (warning).
 - 4) High coolant temperature (shutdown).
 - 5) Low oil pressure (warning).
 - 6) Low oil pressure (shutdown).
 - 7) Overspeed (shutdown).
 - 8) Low fuel level (warning).
 - 9) Low coolant level (warning/shutdown).
 - 10) Generator control not in automatic mode (warning).
 - 11) High battery voltage (warning).
 - 12) Low cranking voltage (warning).
 - 13) Low battery voltage (warning).
 - 14) Battery charger failure (warning).
 - b. Provide audible alarm with silence function.
 - c. Provide lamp test function that illuminates all indicator lamps.
- F. Other Control Panel Features
 1. Inputs and Outputs
 - a. Programmable Digital Inputs

- 1) The Controller shall include the ability to accept eight (8) total with six (6) programmable digital input signals. The signals may be programmed for either high or low activation using programmable Normally Open or Normally Closed contacts.
 - b. Programmable Relay Outputs
 - 1) The control shall include the ability to operate eight (8) total with six (6) programmable relay output signals, integral to the controller. The output relays shall be rated for 2A @ 30VDC and consist of six (6) Form A (Normally Open) contacts and two (2) Form C (Normally Open & Normally Closed) contacts.
 - c. Programmable Discrete Outputs
 - 1) The control shall include the ability to operate one (1) discrete output, integral to the controller, which is capable of sinking up to 300mA.
- G. Maintenance
1. All engine, voltage regulator, control panel and accessory units shall be accessible through a single electronic service tool. The following maintenance functionality shall be integral to the generator set control:
 - a. Engine running hours display.
 - b. Service maintenance interval (running hours or calendar days).
 - c. Engine crank attempt counter.
 - d. Engine successful starts counter.
 - e. 20 events are stored in control panel memory.
 - f. Programmable cycle timer that starts and runs the generator for a predetermined time. The timer shall use 14 user-programmable sequences that are repeated in a 7-day cycle. Each sequence shall have the following programmable set points:
 - 1) Day of week.
 - 2) Time of day to start.
 - 3) Duration of cycle.

2.07 GENERATOR SET ENCLOSURE

- A. Level 1 Sound Attenuating Enclosure
1. The complete diesel engine generator set, including generator control panel, engine starting batteries and fuel oil tank, shall be enclosed in a factory assembled, weather protective enclosure mounted on the fuel tank base.
 - a. A weather resistant enclosure of steel with electrostatically applied powder coated baked polyester paint. It shall consist of a roof, side walls, and end walls. Fasteners shall be either zinc plated or stainless steel. Handles shall be key lockable, all doors keyed alike, and hinges shall be zinc die cast or stainless steel. Access doors shall be hinged and can be lifted off after opening 90 degrees. Intake openings shall be screened to prevent the entrance of rodents or pests.
 - b. Lube oil and coolant drains shall be extended to the exterior of the enclosure and terminated with drain valves. Cooling fan and charging alternator shall be fully guarded to prevent injury.

2.08 SOURCE QUALITY CONTROL

- A. Perform production tests on generator sets at factory to verify operation and performance characteristics prior to shipment. Include certified test report with submittals.
- B. Generator Set production testing to include, at a minimum:
1. Operation at rated load and rated power factor.
 2. Single step load pick-up.
 3. Transient and steady state voltage and frequency performance.
 4. Operation of safety shutdowns.
- C. Diesel Fuel Storage Tanks: Perform pressurized leak test prior to shipment.

2.09 CIRCUIT BREAKER

A. Circuit Breaker Specifications

1. Provide generator mounted 100% circuit breaker, molded case, Quantity per plans stated amp trip, 3 pole, NEMA 1/IP22. Breaker shall utilize a solid state trip unit. The breaker shall be UL/CSA Listed and connected to engine/generator safety shutdowns. Breaker shall be housed in an extension terminal box which is isolated from vibrations induced by the generator set. Mechanical type lugs, sized for the circuit breaker feeders shown on drawing, shall be supplied on the load side of breaker.

2.10 COOLING SYSTEM

- A. The generator set shall be equipped with a rail-mounted, engine-driven radiator with blower fan and all accessories. The cooling system shall be sized to operate at full load conditions and 110° F ambient air entering the room or enclosure (If an enclosure is specified). The generator set supplier is responsible for providing a properly sized cooling system based on the enclosure static pressure restriction.

2.11 EXHAUST SYSTEM

A. Silencer

1. A critical grade silencer, companion flanges, and flexible stainless steel exhaust fitting properly sized shall be furnished and installed according to the manufacturer's recommendation. Mounting shall be provided by the contractor. The silencer shall be mounted so that its weight is not supported by the engine nor will exhaust system growth due to thermal expansion be imposed on the engine. Exhaust pipe size shall be sufficient to ensure that exhaust backpressure does not exceed the maximum limitations specified by the engine manufacturer. Exposed parts shall be protected by high temperature rated finishes to prevent weather corrosion. Provide exhaust condensate trap and drain to trap condensation and prevent condensation from entering the engine.

2.12 STARTING SYSTEM

A. Starting Motor

1. A DC electric starting system with positive engagement shall be furnished. The motor voltage shall be as recommended by the engine manufacturer.

B. Jacket Water Heater

1. Jacket water heater shall be provided and shall be sized to insure that genset will start within the specified time period and ambient conditions.

C. Batteries

1. Batteries - A lead-acid storage battery set of the heavy-duty diesel starting type shall be provided. Battery voltage shall be compatible with the starting system.

D. Battery Charger

1. Battery Charger - A current limiting battery charger shall be furnished to automatically recharge batteries. The charger shall be dual charge rate with automatic switching to the boost rate when required. The battery charger shall be mounted on the genset package or inside the genset enclosure/room.

E. Generating Exercise System

1. Provide 7-day exercising timer system to operate through the ATS to start the generator, run for 1/2 hour under load (time agreement by Owner). Retransfer load and cool down the generator upon completion and shutdown.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Verify that field measurements are as indicated.

- B. Verify that the ratings and configurations of generator sets and auxiliary equipment are consistent with the indicated requirements.
- C. Verify that rough-ins for field connections are in the proper locations.
- D. Verify that mounting surfaces are ready to receive equipment.
- E. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Perform work in accordance with NECA 1 (general workmanship).
- B. Install products in accordance with manufacturer's instructions.
- C. Install generator sets and associated accessories in accordance with NECA/EGSA 404.
- D. Arrange equipment to provide minimum clearances and required maintenance access.
- E. Unless otherwise indicated, mount generator set on properly sized, minimum 6 inch high concrete pad constructed in accordance with Section 03 3000.
- F. Provide required support and attachment in accordance with Section 26 0529.
- G. Use manufacturer's recommended oil and coolant, suitable for the worst case ambient temperatures.
- H. Provide diesel fuel piping and venting in accordance with Section 23 1113, where not factory installed.

3.03 FIELD QUALITY CONTROL

- A. Provide services of a manufacturer's authorized representative to prepare and start systems and perform inspection and testing. Include manufacturer's detailed testing procedures and field reports with submittals.
- B. Notify Owner and Engineer at least two weeks prior to scheduled inspections and tests.
- C. Notify authorities having jurisdiction and comply with their requirements for scheduling inspections and tests and for observation by their personnel.
- D. Provide all equipment, tools, and supplies required to accomplish inspection and testing, including load bank and fuel.
- E. Preliminary inspection and testing to include, at a minimum:
 - 1. Inspect each system component for damage and defects.
 - 2. Verify tightness of mechanical and electrical connections are according to manufacturer's recommended torque settings.
 - 3. Check for proper oil and coolant levels.
- F. Prepare and start system in accordance with manufacturer's instructions.
- G. Perform acceptance test in accordance with NFPA 110.
- H. Inspection and testing to include, at a minimum:
 - 1. Verify compliance with starting and load acceptance requirements.
 - 2. Verify voltage and frequency; make required adjustments as necessary.
 - 3. Verify phase sequence.
 - 4. Verify control system operation, including safety shutdowns.
 - 5. Verify operation of auxiliary equipment and accessories (e.g. battery charger, heaters, etc.).
 - 6. Perform load tests in accordance with NFPA 110 (1.5 hour building load test followed by 2 hour full load test).
 - 7. Record transfer times for switches, crank and starting times, voltage and current at generator and at each transfer switch load side. Return normal power, record transfer times and generator cool down sequence.

- I. Provide field emissions testing where necessary for certification.
- J. Sound Level Tests: Measure sound levels for compliance with specified requirements. Identify and report ambient noise conditions.
- K. Correct defective work, adjust for proper operation, and retest until entire system complies with Contract Documents.
- L. Submit detailed reports indicating inspection and testing results and corrective actions taken.
- M. Provide a fresh change of coolant, lubricant oils, and fluids after tests, refill fuel tank and verify battery charge completion. Document to Owner's Representative for installation acceptance.

3.04 CLEANING

- A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

3.05 CLOSEOUT ACTIVITIES

- A. Demonstration: Demonstrate proper operation of system to Owner, and correct deficiencies or make adjustments as directed.
- B. Training: Train Owner's personnel on operation, adjustment, and maintenance of system.
 - 1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
 - 2. Provide minimum of four hours of training.
 - 3. Instructor: Manufacturer's authorized representative.
 - 4. Location: At project site.
- C. After successful acceptance test and just prior to Substantial Completion, replace air, oil, and fuel filters and fill fuel storage tank.

3.06 PROTECTION

- A. Protect installed engine generator system from subsequent construction operations.

3.07 OPERATION AND MAINTENANCE MANUALS

- A. Provide three (3) sets of operation and maintenance manuals covering the generator, switchgear, and auxiliary components. Include final as-built wiring interconnect diagrams and recommended preventative maintenance schedules.
- B. Provide sequence of operation for the generator and transfer switch system detailing the operation under power failure and operation for system exercising mode.

3.08 TRAINING

- A. On-Site Training
 - 1. Provide on-site training to instruct the owner's personnel in the proper operation and maintenance of the equipment. Review operation and maintenance manuals, parts manuals, and emergency service procedures.
 - 2. Provide video recording of on-site training to Owner's Representative with copies of instructional aids and list of instruments used for instruction.

3.09 SERVICE

- A. Warranty and Supplemental Service.
 - 1. Manufacturer's warranty on the system shall be supplemented as follows to apply over five years after installation acceptance.
 - 2. Annual operating test under load shall be conducted by the responsible generator distributor.
 - 3. System maintenance on annual basis shall check and change all fluids in the engine including lubricant and coolant change out.

4. Fuel shall be tested for moisture and degraded condition. During any annual maintenance where either of the above is noted it shall be changed. Complete change shall be accomplished a minimum of two times, one during the fifth year.
5. Gaskets, hoses, and batteries shall be changed out during the fifth year.

3.10 MAINTENANCE

- A. Provide to Owner a proposal as an alternate to the base bid, a separate maintenance contract for the service and maintenance of engine generator system for two years from date of Substantial Completion; Include a complete description of preventive maintenance, systematic examination, adjustment, inspection, and testing, with a detailed schedule.
- B. Conduct site visit at least once every three months to perform inspection, testing, and preventive maintenance. Submit report to Owner indicating maintenance performed along with evaluations and recommendations.
- C. Provide trouble call-back service upon notification by Owner:
 1. Provide on-site response within 4 hours of notification.
 2. Include allowance for call-back service during normal working hours at no extra cost to Owner.
 3. Owner will pay for call-back service outside of normal working hours on an hourly basis, based on actual time spent at site and not including travel time; include hourly rate and definition of normal working hours in maintenance contract.
- D. Maintain an on-site log listing the date and time of each inspection and call-back visit, the condition of the system, nature of the trouble, correction performed, and parts replaced.

END OF SECTION

SECTION 26 3600 TRANSFER SWITCHES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Transfer switches for low-voltage (600 V and less) applications and associated accessories:
 - 1. Automatic transfer switches.
 - 2. Includes service entrance rated transfer switches.
 - 3. Remote annunciators.

1.02 RELATED DOCUMENTS

- A. This section is a Division 26 Basic Materials and Methods section and is part of each Division 26 section making reference to automatic transfer switches specified herein.

1.03 SCOPE

- A. Furnish and install automatic transfer switches (ATS) with number of poles, amperage, voltage, and withstand current ratings as shown on the plans. Each automatic transfer shall consist of an inherently double throw power transfer switch unit and a microprocessor controller, interconnected to provide complete automatic operation. All transfer switches and control panels shall be the product of the same manufacturer.

1.04 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Concrete equipment pads.
- B. Section 26 3213 - Engine Generators: For interface with transfer switches.
 - 1. Includes code requirements applicable to work of this section.
 - 2. Includes additional testing requirements.
 - 3. Includes related demonstration and training requirements.

1.05 REFERENCE STANDARDS

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
- B. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2020.
- C. NEMA ICS 10 Part 1 - Industrial Control and Systems Part 1: Electromechanical AC Transfer Switch Equipment; 2020.
- D. NETA ATS - Standard For Acceptance Testing Specifications For Electrical Power Equipment And Systems; 2021.
- E. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- F. NFPA 99 - Health Care Facilities Code; 2024.
- G. NFPA 110 - Standard for Emergency and Standby Power Systems; 2022.
- H. UL 869A - Reference Standard for Service Equipment; Current Edition, Including All Revisions.
- I. UL 1008 - Transfer Switch Equipment; Current Edition, Including All Revisions.

1.06 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate compatibility of transfer switches to be installed with work provided under other sections or by others.
 - a. Engine Generators: See Section 26 3213.
 - 2. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances required by NFPA 70.

3. Coordinate arrangement of equipment with the dimensions and clearance requirements of the actual equipment to be installed.
 4. Coordinate the work with placement of supports, anchors, etc. required for mounting.
 5. Closed Transition Transfer Switches:
 - a. Coordinate source interconnection requirements with Utility Company.
 - b. Where applicable, coordinate the work to provide engine generators with isochronous governors suitable for closed transition transfer.
 - c. Coordinate the work to provide shunt trip breakers necessary for protection from source interconnection for longer than specified maximum interconnection time.
 - d. Preinstallation Meeting: Convene one week prior to commencing work of this section to review interconnection requirements and details with Utility Company representative.
 - e. Arrange for inspections necessary to obtain Utility Company approval of installation.
 6. Notify Engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.
- B. Preinstallation Meeting: Convene one week before starting work of this section; require attendance of all affected installers.
- C. Where work of this section involves interruption of existing electrical service, arrange service interruption with Owner.

1.07 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for each product, including ratings, configurations, dimensions, finishes, weights, service condition requirements, and installed features.
 1. Where applicable, include characteristic trip curves for overcurrent protective devices upon request.
- C. Shop Drawings: Include dimensioned plan views and sections indicating locations of system components, required clearances, and field connection locations. Include system interconnection schematic diagrams showing all factory and field connections.
- D. Specimen Warranty: Submit sample of manufacturer's warranty.
- E. Evidence of qualifications for installer.
- F. Evidence of qualifications for maintenance contractor (if different entity from installer).
- G. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and operation of product.
- H. Manufacturer's certification that products meet or exceed specified requirements.
- I. Source quality control test reports.
- J. Manufacturer's detailed field testing procedures.
- K. Field quality control test reports.
- L. Operation and Maintenance Data: Include detailed information on system operation, equipment programming and setup, replacement parts, and recommended maintenance procedures and intervals.
 1. Include contact information for entity that will be providing contract maintenance and trouble call-back service.
- M. Executed Warranty: Submit documentation of final executed warranty completed in Owner's name and registered with manufacturer.
- N. Maintenance contracts.

- O. Project Record Documents: Record actual locations of system components, installed circuiting arrangements and routing, and final equipment settings.
- P. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. Bypass/Isolation Transfer Switches: Provide accessories (ramps, dollies, etc.) necessary for removal of drawout components.

1.08 QUALITY ASSURANCE

- A. Comply with the following:
 - 1. NFPA 70 (National Electrical Code).
 - 2. NFPA 110 (Standard for Emergency and Standby Power Systems); meet requirements for Level 1 system.
- B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.
- C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
 - 1. Authorized service facilities located within 200 miles of project site.
- D. Installer Qualifications: Company with minimum three years documented experience with power transfer systems of similar size, type, and complexity; manufacturer's authorized installer.
- E. Maintenance Contractor Qualifications: Same entity as installer or different entity with specified qualifications.
 - 1. Contract maintenance office located within 200 miles of project site.
- F. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.09 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store transfer switches in accordance with manufacturer's instructions.
- B. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
- C. Handle carefully in accordance with manufacturer's instructions to avoid damage to transfer switch components, enclosure, and finish.

1.10 FIELD CONDITIONS

- A. Maintain field conditions within manufacturer's required service conditions during and after installation.

1.11 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide minimum five year manufacturer warranty covering repair or replacement due to defective materials or workmanship.

1.12 QUALIFICATIONS

- A. Provide Seismic tested equipment based upon applicable seismic requirements of the International Building Code using values from Sheet S0,1.
- B. The following minimum mounting and installation guidelines shall be met, unless specifically modified by the above referenced standards.
 - 1. The Contractor shall provide equipment anchorage details, coordinated with the equipment mounting provision, prepared and stamped by a licensed civil/structural engineer in the state of the project. Mounting recommendations shall be provided by the

- manufacturer based upon the above criteria to verify the seismic design of the equipment.
2. The equipment manufacturer shall certify that the equipment can withstand, that is, function following the seismic event, including both vertical and lateral required response spectra as specified in above codes.
 - C. The equipment manufacturer shall document the requirements necessary for proper seismic mounting of the equipment. Seismic qualification shall be considered achieved when the capability of the equipment, meets or exceeds the specified response spectra.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Transfer Switches - Basis of Design: Generac Power Systems
- B. Transfer Switches - Other Acceptable Manufacturers:
 1. Cummings Power Systems:
 - a. ASCO Power Technologies, a brand of Emerson Network Power.
 - b. Eaton Corporation: www.eaton.com.
 - c. General Electric Company: www.geindustrial.com
 - d. Generac Power Systems: www.generac.com/industrial.
 - e. Approved equal.
- C. Products other than basis of design are subject to compliance with specified requirements. By using products other than basis of design, Contractor accepts responsibility for costs associated with any necessary modifications to related work, including any design fees.
- D. Source Limitations: Provide transfer switches and accessories produced by single manufacturer and obtained from single supplier.

2.02 TRANSFER SWITCHES

- A. Provide complete power transfer system consisting of all required equipment, conduit, boxes, wiring, supports, accessories, system programming, etc. as necessary for a complete operating system that provides the functional intent indicated.
- B. Provide products listed, classified, and labeled as suitable for the purpose intended.
- C. Applications:
 1. Utilize open transition transfer unless otherwise indicated or required.
 2. For transfer of highly inductive loads (e.g. large motors and transformers), utilize open transition transfer with in-phase monitor, delayed transition transfer, or disconnection (prior to transfer) and timed reconnection (after transfer) of designated motors.
 3. Provide signal before transfer contacts for transfer switches serving elevators.
- D. Construction Type: Per Basis of Design.
- E. Automatic Transfer Switch:
 1. Transfer Switch Type: As indicated on the drawings.
 2. Transition Configuration: Open-transition (no neutral position).
 3. Voltage: As indicated on the drawings.
 4. Ampere Rating: As indicated on the drawings.
 5. Neutral Configuration: Delta Configuration.
- F. Comply with NEMA ICS 10 Part 1, and list and label as complying with UL 1008 for the classification of the intended application (e.g. emergency, optional standby).
- G. Do not use double throw safety switches or other equipment not specifically designed for power transfer applications and listed as transfer switch equipment.
- H. Load Classification: Classified for total system load (any combination of motor, electric discharge lamp, resistive, and tungsten lamp loads with tungsten lamp loads not exceeding 30 percent of the continuous current rating) unless otherwise indicated or required.

- I. Switching Methods:
 - 1. Open Transition:
 - a. Provide break-before-make transfer without a neutral position that is not connected to either source, and with interlocks to prevent simultaneous connection of the load to both sources.
 - b. Where in-phase transfer is indicated, utilize in-phase monitor to initiate transfer when phase angle difference between sources is near zero to limit in-rush currents.
- J. Service Conditions: Provide transfer switches suitable for continuous operation at indicated ratings under the service conditions at the installed location.
- K. Enclosures:
 - 1. Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
 - a. Outdoor Locations: Type 4X.
 - 2. Provide lockable door(s).
 - 3. Finish: Manufacturer's standard unless otherwise indicated.
- L. Short Circuit Current Rating:
 - 1. Withstand and Closing Rating: Provide transfer switches, when protected by the supply side overcurrent protective devices to be installed, with listed withstand and closing rating as indicated on the drawings.
 - 2. Short Time Rating: Where the requirement for selectivity is indicated, provide transfer switches with short time ratings suitable for the maximum short time delay setting of the supply side overcurrent protective device.
- M. Automatic Transfer Switches:
 - 1. Description: Transfer switches with automatically initiated transfer between sources; electrically operated and mechanically held.
 - 2. Control Functions:
 - a. Automatic mode.
 - b. Test Mode: Simulates failure of primary/normal source.
 - c. Voltage and Frequency Sensing:
 - 1) Undervoltage sensing for each phase of primary/normal source; adjustable dropout/pickup settings.
 - 2) Undervoltage sensing for alternate/emergency source; adjustable dropout/pickup settings.
 - 3) Underfrequency sensing for alternate/emergency source; adjustable dropout/pickup settings.
 - d. Outputs:
 - 1) Contacts for engine start/shutdown (except where direct generator communication interface is provided).
 - 2) Auxiliary contacts; one set(s) for each switch position.
 - 3) Signal before transfer (load disconnect) contacts; for selective load disconnection prior to transfer.
 - e. Adjustable Time Delays:
 - 1) Engine generator start time delay; delays engine start signal to override momentary primary/normal source failures.
 - 2) Transfer to alternate/emergency source time delay.
 - 3) Retransfer to primary/normal source time delay.
 - 4) Signal before transfer (load disconnect) contact time delay.
 - 5) Engine generator cooldown time delay; delays engine shutdown following retransfer to primary/normal source to permit generator to run unloaded for cooldown period.

- f. In-Phase Monitor (Open Transition Transfer Switches): Monitors phase angle difference between sources for initiating in-phase transfer.
 - g. Synchronization/In-Phase Monitor (Closed Transition Transfer Switches): Monitors voltage and phase angle difference between sources for initiating synchronized transfer.
 - h. Engine Exerciser: Provides programmable scheduled exercising of engine generator selectable with or without transfer to load; provides memory retention during power outage.
 - i. Retransfer to Normal Switch: Bypasses time delays for retransfer to primary/normal source.
3. Status Indications:
 - a. Connected to alternate/emergency source.
 - b. Connected to primary/normal source.
 - c. Alternate/emergency source available.
 - d. Primary/normal source available.
 4. Alarm Indications for Closed Transition Transfer Switches:
 - a. Failure to synchronize.
 - b. Extended source interconnection/transfer switch locked out.
 5. Other Features:
 - a. Event log.
 - b. Communications Capability: Compatible with system indicated. Provide all accessories necessary for proper interface.
 - c. Remote monitoring capability via PC.
 6. Automatic Sequence of Operations:
 - a. Upon failure of primary/normal source for a programmable time period (engine generator start time delay), initiate starting of engine generator where applicable.
 - b. Where applicable, initiate signal before transfer (load disconnect) contacts at programmable time before transfer.
 - c. When alternate/emergency source is available, transfer load to alternate/emergency source after programmable time delay.
 - d. When primary/normal source has been restored, retransfer to primary/normal source after a programmable time delay. Bypass time delay if alternate/emergency source fails and primary/normal source is available.
 - e. Where applicable, initiate shutdown of engine generator after programmable engine cooldown time delay.
- N. Interface with Other Work:
1. Interface with engine generators as specified in Section 26 3213.

2.03 AUTOMATIC TRANSFER SWITCH, AND BYPASS/ISOLATION SWITCHES

- A. Sizes and capacities as indicated, and listed under UL-1008. ATS shall be mechanically held, electrically operated double throw type, 3-pole, with full capacity neutral terminals. Each ATS shall have NEMA 4X enclosure with gaskets, and shall be completely factory assembled, factory wired, and ready for field installation. Each ATS shall include: relays; test switch to simulate normal power failure; pilot lights to indicate switch position; emergency generator starting contacts; other auxiliary contacts closed on normal and closed on emergency; ammeter and voltmeter with selector switches on the load side, and other necessary devices, all as required to operate the switch as specified below.
 1. Operation, each ATS shall have programmable microprocessor based controller to accomplish the following and provide sequence status and local source confirmation. When normal power voltage falls below 80 percent on any one phase, emergency generator starting contacts shall close and start generator unit after an adjustable .5 - 3 second time delay to allow for momentary voltage dips. When emergency power reaches 90 percent of its rated voltage and frequency, ATS shall immediately transfer to

emergency power. After an adjustable 0 - 30 minute time delay period follow restoration of normal power voltage to 90 percent on all phases, ATS shall transfer back to normal power. If emergency power fails during the time delay period, ATS shall return immediately to normal power. After ATS has retransferred to normal power, emergency generator shall continue to run at no load for a 15 minute period to allow it to cool, and then shall shut down.

2. ATS shall have load dump relay.
3. ATS shall have programmed return to normal.
4. ATS shall have phase angle monitoring and provide transfer during the "in phase" interval between generator and utility.
5. ATS shall have programmable exercising to operate as described in this section.
6. ATS shall have external means to interrupt electrical service to the plant without starting the generator. This device shall be protected from external operation except by authorized personnel.

2.04 SOURCE QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for additional requirements.
- B. Perform production tests on transfer switches at factory to verify operation and performance characteristics prior to shipment. Include certified test report with submittals.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that the ratings and configurations of transfer switches are consistent with the indicated requirements.
- C. Verify that rough-ins for field connections are in the proper locations.
- D. Verify that mounting surfaces are ready to receive transfer switches.
- E. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Perform work in accordance with NECA 1 (general workmanship).
- B. Install products in accordance with manufacturer's instructions.
- C. Arrange equipment to provide minimum clearances and required maintenance access.
- D. Install transfer switches plumb and level.
- E. Unless otherwise indicated, mount floor-mounted transfer switches on properly sized 3 inch high concrete pad constructed in accordance with Section 03 3000.
- F. Install automatic transfer switch(s) in accordance with the NFPA and as shown on the drawings.
- G. Level and anchor the automatic transfer(s) switch to floor or wall.
- H. Ground equipment as shown on the drawings and as required by NFPA 70.

3.03 START UP AND TESTING

- A. After the complete system has been installed, and before energizing the system, check all components of the system, including insulation resistance, phase to phase and phase to ground, complete electrical circuitry and safety features according to the manufacturer's written instructions.
- B. After energizing circuits, test the interlocking sequence and operation of the complete system, including time delays of transfer from normal source to emergency and back to normal source, pick-up and voltage drop, and function of bypass/isolation switch in the presence of the

Owner's Representative prior to the final inspection.

- C. When any defects are detected, correct the defects and repeat the test as requested by the
- D. Owner's Representative, at no additional cost to the Owner.

3.04 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for additional requirements.
- B. Provide services of a manufacturer's authorized representative to prepare and start systems and perform inspection and testing. Include manufacturer's detailed testing procedures and field reports with submittals.
- C. Prepare and start system in accordance with manufacturer's instructions.
- D. Automatic Transfer Switches:
 - 1. Inspect and test in accordance with NETA ATS, except Section 4.
 - 2. Perform inspections and tests listed in NETA ATS, Section 7.22.3. The insulation-resistance tests listed as optional are not required.
- E. Provide additional inspection and testing as required for completion of associated engine generator testing as specified in Section 26 3213.
- F. Correct defective work, adjust for proper operation, and retest until entire system complies with Contract Documents.
- G. Submit detailed reports indicating inspection and testing results and corrective actions taken.

3.05 CLEANING

- A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

3.06 CLOSEOUT ACTIVITIES

- A. Demonstration: Demonstrate proper operation of transfer switches to Owner, and correct deficiencies or make adjustments as directed.
- B. Training: Train Owner's personnel on operation, adjustment, and maintenance of transfer switches.
 - 1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
 - 2. Provide minimum of four hours of training.
 - 3. Instructor: Manufacturer's authorized representative.
 - 4. Location: At project site.
- C. Coordinate with related generator demonstration and training as specified in Section 26 3213.

3.07 PROTECTION

- A. Protect installed transfer switches from subsequent construction operations.

3.08 MAINTENANCE

- A. Provide to Owner a proposal as an alternate to the base bid, a separate maintenance contract for the service and maintenance of transfer switches for two years from date of Substantial Completion; Include a complete description of preventive maintenance, systematic examination, adjustment, inspection, and testing, with a detailed schedule.
- B. Conduct site visit at least once every three months to perform inspection, testing, and preventive maintenance. Submit report to Owner indicating maintenance performed along with evaluations and recommendations.
- C. Provide trouble call-back service upon notification by Owner:
 - 1. Provide on-site response within 4 hours of notification.

2. Include allowance for call-back service during normal working hours at no extra cost to Owner.
 3. Owner will pay for call-back service outside of normal working hours on an hourly basis, based on actual time spent at site and not including travel time; include hourly rate and definition of normal working hours in maintenance contract.
- D. Maintain an on-site log listing the date and time of each inspection and call-back visit, the condition of the system, nature of the trouble, correction performed, and parts replaced.

END OF SECTION

**SECTION 43 2139
NSF 61 CERTIFIED VERTICAL TURBINE PUMP**

PART 1 GENERAL

1.01 GENERAL

- A. The pumps shall be the vertical turbine type, having an open lineshaft product lubricated design.
- B. Provide and install vertical turbine pumps.

1.02 REFERENCES

- A. ANSI/AWWA E103-21, Horizontal Centrifugal and Vertical Line Shaft Pumps
- B. ANSI/HI 9.6.4-2016, Rotodynamic Pumps for Vibration Measurement and Allowable Values
- C. ANSI/HI 14.6-2016, Rotodynamic Pumps for Hydraulic Performance Acceptance Tests
- D. ASME B16.1-2020, Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250
- E. ASME B16.5-2020, Pipe Flanges and Flanged Fittings
- F. ISO 21940-11, Mechanical Vibration-Rotor Balancing
- G. NSF/ANSI/CAN 61-2022, Drinking Water System Components-Health Effects
- H. NSF/ANSI/CAN 372-2022, Drinking Water System Components-Lead Content

1.03 QUALITY ASSURANCE

- A. The pump manufacturer shall be fully certified by the International Standards Organization per ISO 9001:2015.
- B. The pumps shall operate without excessive noise or vibration, conforming to ANSI/HI 9.6.4-2016 for the allowable pump vibration limits.
- C. The pumps shall be certified to NSF/ANSI/CAN 61 & 372 for use in potable water applications.
- D. [Optional] The manufacturer shall perform a factory non-witnessed hydraulic performance test on the bowl assemblies per ANSI/HI 14.6-2016 acceptance grade 1U. The test shall be performed utilizing a factory lab motor. A certified copy of the test results shall be provided to the Buyer prior to shipment.
- E. [Optional] The manufacturer shall perform a factory non-witnessed hydrostatic pressure test on the bowl assemblies and discharge heads per ANSI/HI 14.6-2016. The test pressure shall be twice the pressure at rated capacity or 1-1/2 times the shut-off pressure, whichever is greater. A certified copy of the test results shall be provided to the Buyer prior to shipment.

1.04 WARRANTY

- A. The pump manufacturer shall provide a warranty for the pumps to be free from defects in material and workmanship under normal use and service for a period of 1 year from the date of shipment.

PART 2 PRODUCTS

2.01 APPROVED MANUFACTURERS

- A. American-Marsh Pumps
- B. Approved equal.

2.02 OPERATING CONDITIONS AND PERFORMANCE REQUIREMENTS

VERTICAL TURBINE PUMP SCHEDULE	
Equipment Number	11LC
Number of Pumps	2

Primary Rated Capacity (gpm)	750
Primary Rated Total Dynamic Head (feet)	150
Minimum Bowl Efficiency at Primary Rated Capacity (%)	80
Rated Speed (rpm)	1750
Minimum Horsepower (hp)	40
NPSHa (feet)	6.5
Discharge Head Type	Flanged Flat Face
Discharge Flange Diameter (inches)	8
Column Pipe Type	Sch 30 (0.277")
Column Pipe Diameter (inches)	8
Seal Housing Assembly Type	Mechanical
Pump Overall Length (feet)	10

2.03 MATERIALS AND CONSTRUCTION

- A. All pump materials in contact with the working fluid shall be NSF/ANSI/CAN 61 & 372 certified for use in potable water service.
- B. Pumps shall be manufactured with the following materials unless defined otherwise in these specifications:

PART	MATERIAL	SPECIFICATION
Head Assembly		
Discharge Head	Cast Iron or Fabricated Steel	ASTM A48, Class 30 or ASTM A53, Grade B/ASTM A36
Foundation Plate	Steel	ASTM A36
Packing Housing	Cast Iron	ASTM A48, Class 30
Packing Housing Bearing	Bronze	C95400 or C89835
Lantern Ring	Bronze	C95400 or C89835
Packing Gland	Stainless Steel	Type 304
Lower Seal Housing	Cast Iron	ASTM A48, Class 30
Lower Seal Housing Bearing	Bronze	C95400 or C89835
Fasteners	Stainless Steel	Type 18-8
Column Assembly		
Column Pipe	Steel	ASTM A53, Grade B
Column Pipe Coupling	Steel	API 5CT or 1020
Line Shaft	Stainless Steel	Type 416
Line Shaft Coupling	Stainless Steel	Type 416
Bearing Retainer	Stainless Steel	Type 304
Bearing Insert	Rubber	NBR6231-70
Bowl Assembly		

Discharge Case	Ductile Iron	ASTM A536, Grade 65-45-12
Discharge Case Bearing	Bronze	C95400 or C89835
Bearing Insert	Rubber	NBR6231-70
Bowl	Cast Iron	ASTM A48, Class 30
Bowl Shaft	Stainless Steel	Type 416
Bowl Wear Ring	Bronze	C95400
Bowl Bearing	Bronze	C95400 or C89835
Impeller	Stainless Steel	Type 304 (CF8) or Type 316 (CF8M)
Collet	Stainless Steel	Type 416
Suction Case	Cast Iron	ASTM A48, Class 30
Suction Case Bearing	Bronze	C95400 or C89835
Suction Bell	Cast Iron	ASTM A48, Class 30
Fasteners	Stainless Steel	Type 18-8
O-Rings	Rubber	N70 or V75
Strainer		
Basket Strainer	Stainless Steel	Type 316

2.04 BOWL ASSEMBLY

- A. The pump bowls shall be of close grained ASTM A48, Class 30 cast iron free of blow holes, sand holes, and other detrimental defects. They shall be accurately machined and fitted. The water passageways shall be enamel lined to reduce friction loss on bowls 15" and under. The bowls shall be capable of withstanding a hydrostatic pressure equal to twice the pressure at rated capacity or 1-1/2 times the shut-off pressure, whichever is greater. The bowls shall be flange connected with bolting of Type 18-8 stainless steel. The bowls shall be equipped with C95400 bronze replaceable wear rings on the suction side of the enclosed impellers. Sealing between bowls shall be accomplished by means of an o-ring or gasket.
- B. The impellers shall be of investment cast CF8 Type 304 stainless steel or CF8M Type 316 stainless steel, enclosed type, and statically and dynamically balanced. The impellers shall be balanced to ISO 21940-11 Grade G6.3. Impellers shall be securely fastened to the shaft with Type 416 stainless steel tapered locking collets for bowls 15" and under. Bowls 16" and greater shall be provided with keyed impellers. A suitable adjustable mechanism shall be provided to achieve the proper axial position of the impellers with respect to the bowl.
- C. The bowl shaft shall be of Type 416 stainless steel pump shaft quality (PSQ) and shall be turned, ground, and polished with a surface finish not to exceed 40 RMS per ASME B46.1. It shall be supported by C95400 or C89835 bronze bearings above and below each impeller. The size of the bowl shaft shall be no less than that determined by ANSI/AWWA E103-21.
- D. The bowl assembly shall be supplied with a top discharge case of ASTM A536, Grade 65-45-12 ductile iron when threaded column pipe is provided. The discharge case shall be accurately machined to accept the specified size of threaded column pipe.
- E. The suction case shall be of close grained ASTM A48, Class 30 cast iron free of blow holes, sand holes, and other detrimental defects. The suction case bearing shall be of C95400 or C89835 bronze. It shall be grease lubricated. A Type 316 stainless steel sand cap shall protect the suction case bearing from abrasives in the pumping fluid.
- F. A belled suction shall be provided to reduce entrance losses to a minimum. The suction bell shall be of close grained ASTM A48, Class 30 cast iron free of blow holes, sand holes, and other detrimental defects.

2.05 STRAINER

- A. A Type 316 stainless steel basket type strainer shall be provided having a net inlet area equal to at least four times the suction pipe area. The maximum opening size shall not be more than 75 percent of the minimum opening of the water passage through the bowl and impeller.

2.06 COLUMN PIPE ASSEMBLY

- A. Line Shafts and Couplings
 1. The column assembly shall be of the open line shaft, product lubricated design. The line shafts shall be of Type 416 stainless steel PSQ and shall be turned, ground, and polished with a surface finish not to exceed 40 RMS per ASME B46.1. They shall be furnished in interchangeable sections not over 10' in length.
 2. The size of the line shafts shall be as recommended by the pump manufacturer, but the size shall not be less than that determined by ANSI/AWWA E103-21. They shall be sized to handle the torque and hydraulic down thrust imposed on the shafts by the pumping unit during operation. Shaft elongation due to hydraulic down thrust shall not exceed the axial clearance of the impellers in the pump bowls.
 3. To ensure accurate alignment of the shafts, they shall be straight within 0.005" total indicator reading (TIR) for a 10' section, and the butting faces shall be machined square to the axis of the shaft. The maximum permissible error in the axial alignment of the thread axis with the axis of the shaft shall be 0.002" in 6".
 4. The line shafts shall be coupled with Type 416 stainless steel couplings. The couplings shall have left-hand threads that tighten during pump operation. Line shafts larger than 2-15/16" shall utilize a ring and key type coupling design.
- B. Line Shaft Bearings and Retainers
 1. The line shaft bearings shall be designed for vertical turbine pump service, to be lubricated by the pumping fluid. They shall be of NBR6231-70 rubber with a minimum 70 shore hardness. They shall be the snap-in type with internal grooves to flush out sand and other abrasives.
 2. The line shaft bearings shall be spaced at intervals not to exceed 10' for 1800 RPM and below. The bearing spacing shall not exceed 5' for 2200 RPM and above.
 3. The line shaft bearings shall be mounted inside drop-in type bearing retainers held in position between sections of column pipe. The bearing retainers shall be of Type 304 stainless steel.
 - a. Column pipe with a diameter 14" and greater shall be furnished with weld-in fabricated steel bearing retainers on all intermediate and bottom sections in lieu of drop-in bearing retainers.

2.07 COLUMN PIPE (THREADED)

- A. The column pipe shall be of ASTM A53, Grade B steel. Column piping 6" and smaller shall be schedule 40 threaded and coupled pipe; column piping larger than 6" shall be schedule 30 threaded and coupled pipe (except 10" column pipe which shall have a 0.279" wall thickness).
 1. Column pipe with a diameter 14" and greater shall be the flanged type.
- B. The column pipe shall be furnished in interchangeable sections having a nominal length of not more than 10'. The top and bottom sections of column pipe shall not exceed 5' in length.
- C. The ends of each section of column pipe shall be faced parallel, and the threads machined to such a degree that the ends will butt against the bearing retainer shoulder to ensure proper alignment and to secure the bearing retainers when assembled.
- D. If possible, the column pipe size shall be such that the friction loss will not exceed 5' of head per 100' of column pipe, based on the rated capacity of the pump.

2.08 DISCHARGE HEAD (CAST IRON)

- A. The discharge head shall be of close grained ASTM A48, Class 30 cast iron free of blow holes, sand holes, and other detrimental defects. It shall be accurately machined with a surface type discharge. The bottom face of the discharge head shall be circular and fully finished.
- B. The discharge flange shall be machined and drilled to ASME/ANSI B16.1 standards for a 125# rating. It shall be the flat face type.
- C. The top flange of the discharge head shall have a rabbet fit to accurately locate the vertical P-base motor.

2.09 FOUNDATION PLATE

- A. A square, ASTM A36 steel, foundation plate shall be provided. The foundation plate size shall be equal to or greater than the diameter of the discharge head base, and it shall be of sufficient size and strength to support all loads to which it may be subjected. Four holes shall be provided, one at each corner, to accommodate anchor bolts. The foundation plate shall have a center opening of adequate size to facilitate the setting and removal of the pumping unit without removal of the foundation plate.

2.10 SEAL HOUSING ASSEMBLY (MECHANICAL SEAL)

- A. The lower seal housing shall be of ASTM A48, Class 30 cast iron. A lower seal housing bearing of C95400 or C89835 bronze shall be provided to support the top line shaft. All fasteners shall be of Type 18-8 stainless steel.
- B. Sealing between the lower seal housing and the discharge head shall be accomplished by means of an o-ring.
- C. The mechanical seal shall be of the cartridge type, and it shall be one of the following models manufactured by Chesterton: 150, 155, 180, 442, or 442C.
 - 1. The rotary face shall be of silicon carbide, and the stationary face shall be of carbon. All metal parts shall be of Type 316 stainless steel. The springs shall be of Hastelloy C, and the o-rings shall be of ethylene propylene (EPR).
 - 2. The seal materials shall be compatible with the pumping fluid.
- D. Configuration shall allow removal of the mechanical seal without disturbing the motor.

2.11 SUCTION BARREL

- A. The suction barrel shall be of the closed bottom configuration, and it shall be fabricated of ASTM A53, Grade B steel and ASTM A36 steel.
- B. The suction barrel shall be sized in accordance with ANSI/HI 9.8-2018. The liquid velocity shall not exceed a maximum of 5 ft/s between the barrel and suction bell, flange, or coupling.
- C. Flow-straightening vanes shall be provided to reduce vortexing. A pair of vanes shall be centered on the inlet to the barrel and extend to the top of the barrel. A set of vanes in the form of a cross shall be provided under the pump suction bell.

2.12 PAINT AND COATINGS

- A. All pumping unit surfaces in contact with the working fluid shall be coated with an NSF/ANSI/CAN 61 & 372 certified coating.
 - 1. The interior of the discharge head shall be coated with Tnemec N140 Pota-Pox Plus. Two coats shall be applied of 2-9 mils DFT per coat. Coating color shall be 00WH Tnemec White. Surface preparation shall meet SSPC-SP10/NACE 2 near-white blast cleaning with a minimum angular profile of 1.5 mils.
 - 2. The wetted exterior of the packing housing shall be coated with Tnemec N140 Pota-Pox Plus. Two coats shall be applied of 2-9 mils DFT per coat. Coating color shall be 00WH Tnemec White. Surface preparation shall meet SSPC-SP10/NACE 2 near-white blast cleaning with a minimum angular profile of 1.5 mils.

3. The interior and exterior of the column pipe shall be coated with Tnemec N140 Pota-Pox Plus. Two coats shall be applied of 2-9 mils DFT per coat. Coating color shall be 00WH Tnemec White. Surface preparation shall meet SSPC-SP10/NACE 2 near-white blast cleaning with a minimum angular profile of 1.5 mils.
 4. The interior and exterior of the bowl assembly non-enameled surfaces shall be coated with Tnemec N140 Pota-Pox Plus. Two coats shall be applied of 2-9 mils DFT per coat. Coating color shall be 00WH Tnemec White. Surface preparation shall meet SSPC-SP10/NACE 2 near-white blast cleaning with a minimum angular profile of 1.5 mils.
 5. The interior of the suction barrel shall be coated with Tnemec N140 Pota-Pox Plus. Two coats shall be applied of 2-9 mils DFT per coat. Coating color shall be 00WH Tnemec White. Surface preparation shall meet SSPC-SP10/NACE 2 near-white blast cleaning with a minimum angular profile of 1.5 mils.
- B. All non-wetted surfaces including the exterior of the discharge head and exterior of the foundation plate shall be coated with American-Marsh Pumps' standard paint. Coating color shall be AMP Red.

2.13 MOTOR

- A. The electric motor shall be of the vertical, NEMA design B, P-base, squirrel cage induction design. It shall be premium efficient and inverter duty rated per NEMA MG-1 Part 31 at a 1.00 service factor.

MOTOR DATA	
Shaft Type	416 S.S.
Horsepower (hp)	40
Synchronous Speed (rpm)	1750
Voltage (V)	480
Phase	3
Frequency (Hz)	60

- B. The motor rating shall be sized such that it will not be loaded beyond the nameplate rating at any point along the pump characteristic curve. Use of the motor's service factor will not be acceptable.
- C. The motor shall be equipped with a non-reverse ratchet to prevent the pump from spinning backwards. The motor shall be equipped with winding thermostat, inverter grade insulation, internal shaft grounding ring, upper insulated bearing, and 115 volt space heater (through 250 hp).
- D. The high thrust bearing shall be capable of carrying the continuous hydraulic down thrust generated by the pump during operation at any point along the pump characteristic curve with an AFBMA L-10 minimum bearing life of 44,000 hours. The bearing shall be capable of withstanding a momentary upthrust of at least 30% of the rated hydraulic down thrust.
- E. A motor steady bushing shall be required for all 2 pole applications or when a mechanical seal is used with a vertical hollow shaft motor.
- F. A suitable adjustable mechanism shall be provided to achieve the proper axial position of the impellers with respect to the bowl.
1. For a vertical hollow shaft motor, the impellers shall be adjustable by means of a nut at the top of the motor. The head shaft shall be of Type 416 stainless steel and shall be furnished with a threaded coupling of Type 416 stainless steel.
 2. For a vertical solid shaft motor, the impellers shall be adjustable by means of a flanged spacer coupling.
- G. Eyebolts or equivalent lifting points shall be provided to the lift the motor safely.

H. The motor shall be manufactured by Nidec (US Motors), or equal.

END OF SECTION

**SECTION 46 5109
TONKA WATER INDUCED DRAFT AERATOR**

PART 1 – GENERAL

1.01 SUMMARY

- A. This specification describes a complete operational system based on products and services as manufactured by Tonka Water, a Kurita brand, of Minneapolis, MN.
- B. Complete system to be furnished by a single responsible equipment manufacturer. It is the intent of this specification that the Manufacturer assumes system and process responsibility for equipment and appurtenances.
- C. Provide aeration equipment and all appurtenances described in this section of the specification.
- D. This specification has been prepared on the basis of specific requirements for this application. Modification of manufacturer's standard equipment design will be required to meet this specification.
 - 1. It will be mandatory that all equipment manufacturers meet all requirements of this specification. Equipment manufacturers shall modify their standard designs and recommended operational parameters to meet all requirements of this specification. Any claims to the contrary, whether specific or implied, indicating that the equipment may not meet the specifications, will be considered grounds for rejection of the bid.
- E. Equipment manufacturer must have a quality management system that is ISO 9001:2015 certified. Certification must remain in effect throughout the project commissioning.

1.02 REFERENCES

- A. American Water Works Association (AWWA)
- B. American National Standards Institute (ANSI)
- C. American Society of Mechanical Engineers (ASME)
- D. U.S. Food and Drug Administration (FDA)
- E. National Sanitation Foundation (NSF)

1.03 QUALITY ASSURANCE

- A. Base bid manufacturer: Tonka Water, a Kurita brand, of Minneapolis, MN.
- B. Alternate manufacturer pre-qualification requirements:
 - 1. Provide complete package of required documentation at least Fourteen (14) days prior to published bid date and time.
 - 2. Required contents for non-pre-approved manufacturers' pre-qualification package:
 - a. A list of ten reference systems of identical type and similar size which have been installed and in successful operation for at least 1 year, using the processes and methods specified herein, including simultaneous air/water backwashing for sustained durations.
 - b. Detailed equipment drawings, to scale, and complete detailed information covering equipment, processes and methods specified.
 - c. An unpriced proposal indicating the total scope of the work being proposed and containing an itemized list of all equipment, materials and appurtenances, including structural configuration drawings and details.
 - d. Installation, operation and maintenance manuals from the ten references in paragraph (2.a.) above.
 - e. Evidence of manufacturer's engineering staff experience necessary to complete this project. Include the resume of the supervisory P.E. who will affix his or her stamp on the submittal drawings. Such engineer shall be a direct employee of the manufacturer.

- f. Warranties and Bonds. Proof of ability to furnish warranties and bonds as described elsewhere in this specification.
- g. Evidence of the manufacturer's ISO 9001:2015 quality system certification, including certificate. Manufacturer must submit their quality manual upon request.
3. Failure to provide the pre-qualification documents as described above will result in rejection of Contractor's bid if such bid indicates a manufacturer other than those pre-approved by the engineer.
4. Engineer Review. The above qualification information will be reviewed by the engineer. Contractors submitting requests for alternate manufacturer approval will be notified by contract addendum 5 days before receipt of bids. All such decisions are final.

1.04 SYSTEM DESCRIPTION

- A. Design Requirements: See Equipment Schedule

1.05 SUBMITTALS/SHOP DRAWINGS

- A. Shop Drawings: Submit complete set for approval prior to fabrication.
- B. O&M manuals: Provide 1 printed copy and 1 digital media copy.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Base bid Manufacturer: Tonka Water, a Kurita brand.
- B. Pre-Approved Alternate Manufacturers: None.

2.02 MATERIALS

- A. Fabricate all components with new, high-quality materials that are free from defects.
- B. Refer to Equipment Schedule and Plans for configuration and quantities.

2.03 DETAILS OF CONSTRUCTION

2.04 AERATOR

1. Aerator Body shall be square configuration
 - a. System is located in a seismically active area.
2. Material thickness: minimum 3/16" thick 3003 or 5052 aluminum plate
3. The top and bottom plates shall be appropriately reinforced with structural aluminum members.
4. The aerator chamber shall be continuously fillet welded throughout both the interior and exterior of the unit.
 - a. All welds shall be of the same size as the thickness of the plate specified.
5. The aerator chamber shall be supplied with a hinged full width side access panel. The hinged side panel shall be designed to swing out of the way to permit access to the internal tubes. The side access panel shall be gasketed to prevent leakage around the perimeter surfaces of the door. The door shall be equipped with a no-bolt entry system that will permit the door to be opened without having to loosen any perimeter bolts and nuts or latches.
6. Legs
 - a. Designed to withstand 100 mph wind load without guy wire
 - b. Material: same as the aerator chamber.
 - c. Equip with mounting holes.
 - d. Anchor bolts provided by the Contractor as shown on the plans.
7. Nozzles
 - a. Raw water influent connection: Flanged
 - b. Effluent connection: Plain end
 - c. Inspection hatch: As described in the Equipment Schedule.
8. Top-mounted air exhaust curb for the blower assembly.

2.05 AERATOR COMPONENTS

- A. Tonka Water Header Lateral Distributor
 - 1. Designed to provide uniform flow through the aerator during operation.
 - 2. Header-Lateral Pipes: PVC pipe construction
 - 3. Tonka Water low head, hollow cone pattern spray nozzles.
 - a. Non-clog design,
 - b. Material: Sch. 80 PVC.
 - c. The nozzles shall be designed to operate with at the design flow, but not to exceed a pressure drop of 3.5 psi.
 - 4. Supported and braced to withstand all hydraulic forces encountered during operation.
 - 5. Factory installed
 - 6. Systems utilizing distribution pans with target nozzles to distribute the water shall not be acceptable, due to the inability of this design to create a fine water droplet.

2.06 BLOWER ASSEMBLY

- A. Mounted on the air exhaust flange building roof as shown on the plans.
 - 1. Interconnecting ductwork between aerator body and blower assembly is by CONTRACTOR
- B. Blower housing
 - 1. All Aluminum Construction
 - 2. Equip with 24 mesh stainless steel screened hood assembly to prevent water and debris from entering
 - 3. The upper exhaust hood will extend down to fully protect the screen assembly to meet Wisconsin requirements.
- C. Extreme Service Motor
 - 1. Designed for extreme service
 - 2. Designed for high Moisture applications
 - 3. Shaft and Bearings: Stainless Steel construction
 - 4. Housing and end plates: epoxy coated cast iron
 - 5. Include automatic one-way condensate drain
- D. Direct Connected Fan.
 - 1. Fan blade: Cast Aluminum Propeller
 - 2. Directly connected to the motor shaft
 - 3. Properly balanced and sized to provide the air volume and pressure as listed on the Equipment Schedule.

2.07 FINISHES

- A. All exterior surfaces of the aerator shall receive a buff-blast finish prior to shipment of the unit.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Delivery and Storage
 - 1. Upon delivery of the equipment to the jobsite, perform an inventory of the shipment and immediately report to the equipment manufacturer any discrepancies between the equipment packing lists and shipping documents to the equipment manufacturer.
 - 2. Contractor is responsible for off-loading and protection of all equipment against damage and during on-site storage and installation. Damaged equipment and materials will be replaced at Contractor's expense.
- B. Manufacturer's Instructions:
 - 1. Submit manufacturer's installation instructions and assembly drawings for engineer's approval prior to shipment of equipment.

2. Install equipment as shown on the plans and in accordance with the manufacturer's recommendations, instructions and assembly drawings.

3.02 FACTORY SERVICES AND COMMISSIONING

A. Installation Advisory:

1. Coordinate with the treatment equipment manufacturer to provide factory advisory or direction during critical phases of installation which may include:
 - a. Setting of equipment.
 - b. Installation of internals.
 - c. Installation of controls.
 - d. Wiring instrumentation.
 - e. Other components critical to system operation.
2. See Factory Services and Commissioning Schedule below.

B. System Start-Up and Training

1. Verify in writing that the project is ready for manufacturer's field services. Copies of written verification shall be given to the manufacturer, engineer and owner prior to scheduling field services.
2. Provide the services of a factory representative during start-up of the treatment equipment.
3. Provide the number of days on site for start-up supervision as outlined in the Factory Services and Commissioning Schedule below. At a minimum, the equipment manufacturer's technician shall perform the following start-up functions:
 - a. Inspect the final installation to assure proper installation, connection and wiring of all equipment of the manufacturer's supply.
 - b. Commissioning of the equipment in the presence of the Contractor and Owner's operating personnel.
 - c. Training of Owner's operating personnel in proper operation and maintenance procedures, start-up/shutdown procedures, response to emergency conditions, and troubleshooting.
4. The responsibility of the Contractor and the factory service representative with regard to commissioning shall be fulfilled when the start-up is complete, the equipment is functioning properly, operating personnel have been trained and the equipment has been accepted by the Owner.

C. Factory Services and Commissioning Schedule:

Equipment Installation Inspection:	1/2 day on site
Commissioning & Operator Instruction:	1/2 day on site
Warranty Close-out	1 day on site
Minimum number of trips required:	X trips

3.03 EQUIPMENT SCHEDULE

A. Materials and Equipment:

Design Flow Rate:	750 gpm
Number of Aerators:	1
Aerator Chamber Dimensions:	5.5' X 5.5'
Body Height:	8'
Nozzle Sizing:	
Flanged Influent:	8"
Plain End Effluent:	10"

B. Blower

Number of Blowers:	1
Capacity per Blower:	3,000 CFM
Operating Pressure:	3/8 " water column
H.P.	3/4
Voltage Requirements:	120/240VAC

END OF SECTION