



JEO CONSULTING GROUP INC
JEO ARCHITECTURE INC

**PLANS, SPECIFICATIONS AND CONTRACT DOCUMENTS
FOR
WALNUT CREEK SEWER REPAIR
FOR
CRETE, NEBRASKA**

Engineering
Architecture
Surveying
Planning
Funding

**PLANS, SPECIFICATIONS AND CONTRACT DOCUMENTS
FOR
WALNUT CREEK SEWER REPAIR
FOR
CRETE, NEBRASKA**

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JEO PROJECT NO. 241729.00



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**WALNUT CREEK SEWER REPAIR
FOR
CRETE, NEBRASKA
JEO PROJECT NO. 241729.00**



The following Specification Sections have been prepared by myself or under my direct supervision:

<u>Sections</u>	<u>Title</u>
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Division 01 – All Sections Included	General Requirements
Division 02 – All Sections Included	Existing Conditions
Division 03 – All Sections Included	Concrete
Division 09 - All Sections Included	Finishes
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**WALNUT CREEK SEWER REPAIR
FOR
CRETE, NEBRASKA
JEO PROJECT NO. 241729.00**



The following Specification Sections have been prepared by myself or under my direct supervision:

Sections

Division 05 – All Sections Included

Title

Metals

SECTION 00 10 00 INVITATION TO BID

Sealed Proposals for the construction of "Walnut Creek Sewer Repair for the City of Crete," JEO Project No. 241729.00, QuestCDN No. 9353985, will be received by the City Administrator at 243 East 13th Street, Crete, NE 68333, until 2:00 PM on the 26th day of November 2024, and thereafter will be read aloud.

The work is generally described as follows: Replacement of an existing 45' long 8" aerial sewer crossing in-kind.

Opinion of Probable Cost \$210,000

Proposals will be taken for said construction work listed above by unit prices, as an aggregate bid for the entire project.

Copies of the contract documents are on file with the City of Crete for examination by bidders. Complete digital project bidding documents are available at JEO's website at jeo.com for \$30. An optional paper set of project documents is available for a non-refundable price of \$75 per set. Please contact Sarah Divis at sdivis@jeo.com or 402.443.7496 to coordinate your request and send your check to: 1937 North Chestnut Street, Wahoo, NE 68066. In order to bid the project, the contract documents must be issued directly by JEO Consulting Group, Inc. or QuestCDN to the bidder.

All Proposals for said construction work must be made on blanks furnished by the Engineer and must be accompanied by Bid Security of not less than 5% of the amount bid. Bid Security to be made payable to the Treasurer of the City of Crete as liquidated damages in case the bid is accepted and the bidder neglects or refuses, to enter into contract and furnish bond in accordance herewith.

The project is funded in whole or in part by State and Local Fiscal Recovery Funds (SLFRF) through the American Rescue Plan Act (ARPA).

The Owner reserves the right to waive informalities and irregularities and to make awards on bids which furnish the materials and construction that will, in their opinion serve the best interests of the Owner, and also reserves the right to reject any and/or all bids.

CITY OF CRETE
Dave Bauer, Mayor

ATTEST: Tom Ourada, City Administrator

PUBLISHED: The Crete News
November 6, 2024
November 13, 2024
November 20, 2024

SECTION 00 21 00
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 [insert version number] 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. Electronic Documents that are available in native file format include:
 - a. **[List documents that will be made available to Contractor]**~~
 - ~~2. Release of such documents will be solely for the convenience of the Contractor. No such document is a Contract Document.~~
 - ~~3. 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.~~
 - ~~4. 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.~~

- 2.07 In order to bid the project, the contract documents must be issued directly to the Bidder from JEO Consulting Group, Inc. or QuestCDN. The Bid shall be submitted by the same firm that was issued the contract documents.

ARTICLE 3—QUALIFICATIONS OF BIDDERS

- 3.01 To demonstrate Bidder's qualifications to perform the Work, after submitting its Bid and within **five** days of Owner's request, Bidder must submit the following information:
 - A. Written evidence establishing its qualifications such as financial data, previous experience, and present commitments.

- B. 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.
- C. Bidder's state or other contractor license number, if applicable.
- D. Subcontractor and Supplier qualification information.
- E. Other required information regarding qualifications.

3.02 Deleted

3.03 ~~Bidder is to submit the following information with its Bid to demonstrate Bidder's qualifications to perform the Work:~~

- ~~A. Written evidence establishing its qualifications such as financial data, previous experience, and present commitments.~~
- ~~B. 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.~~
- ~~C. Bidder's state or other contractor license number, if applicable.~~
- ~~D. Subcontractor and Supplier qualification information.~~
- ~~E. Other required information regarding qualifications.~~

3.04 A Bidder's failure to submit required qualification information within the times indicated may disqualify Bidder from receiving an award of the Contract.

3.05 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 pre-bid conference will not be conducted for this Project.

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.
 4. ~~Geotechnical Baseline Report/Geotechnical Data Report: The Bidding Documents contain a Geotechnical Baseline Report (GBR) and Geotechnical Data Report (GDR).~~
 - a. ~~As set forth in the Supplementary Conditions, the GBR describes certain select subsurface conditions that are anticipated to be encountered by Contractor during construction in specified locations ("Baseline Conditions"). The GBR is a Contract Document.~~
 - b. ~~The Baseline Conditions in the GBR are intended to reduce uncertainty and the degree of contingency in submitted Bids. However, Bidders cannot rely solely on the Baseline Conditions. Bids should be based on a comprehensive approach that includes an independent review and analysis of the GBR, all other Contract Documents, Technical Data, other available information, and observable surface conditions. Not all potential subsurface conditions are baselined.~~
 - c. ~~Nothing in the GBR is intended to relieve Bidders of the responsibility to make their own determinations regarding construction costs, bidding strategies, and Bid prices, nor of the responsibility to select and be responsible for the means, methods, techniques, sequences, and procedures of construction, and for safety precautions and programs incident thereto.~~
 - d. ~~As set forth in the Supplementary Conditions, the GDR is a Contract Document containing data prepared by or for the Owner in support of the GBR.~~
- 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. In addition to the documents regarding existing Site conditions referred to in Paragraph 5.02.A, the following other documents relating to conditions at or adjacent to the Site are known to Owner and made available to Bidders for reference:

1. **None.**

Owner will make copies of these other Site-related documents available to any Bidder on request.

- B. Owner has not verified the contents of these other Site-related documents, and Bidder may not rely on the accuracy of any data or information in such documents. Bidder is responsible for any interpretation or conclusion Bidder draws from the other Site-related documents.
- C. The other Site-related documents are not part of the Contract Documents.
- D. Bidders are encouraged to review the other Site-related documents, but Bidders will not be held accountable for any data or information in such documents. The requirement to review and take responsibility for documentary Site information is limited to information in (1) the Contract Documents and (2) the Technical Data.
- E. 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. A Site visit is scheduled following the pre-bid conference. Maps to the Site will be available at the pre-Bid conference.~~
- ~~C. A Site visit is scheduled for [designate, date, time and location]. Maps to the Site will be made available upon request.~~
- D. Bidders visiting the Site are required to arrange their own transportation to the Site.
- ~~E. All access to the Site other than during a regularly scheduled Site visit must be coordinated through the following Owner or Engineer contact for visiting the Site: [provide contact information]. Bidder must conduct the required Site visit during normal working hours.~~
- F. Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.
- G. 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.
- H. 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.

- I. 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. [Insert contact information for submittal of questions to Engineer; describe any permissible or required special procedures, such as submittal via a Bidding Documents Website.]~~

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 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, **or in the form of a certified check**. Such Bid bond will be issued in the form included in the Bidding Documents. **Bid security must be at least 5% of the Bidder's maximum Bid price.**
- 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 (a) substantially completed and (b) ready for final payment, and (c) Milestones (if any) are to be achieved, are set forth in the Agreement.
- 9.02 **Deleted**
- 9.03 Provisions for liquidated damages, if any, for failure to timely attain a Milestone, Substantial Completion, or completion of the Work in readiness for final payment, are set forth in the Agreement.

ARTICLE 10—SUBSTITUTE AND "OR EQUAL" ITEMS

- 10.01 **Deleted**
- 10.02 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~~ **at least 15 days prior to the date for receipt of Bids in the case of a proposed substitute,**

and 5 days prior in the case of a proposed “or-equal.” 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.

- 10.03 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 Deleted

- 11.02 The apparent Successful Bidder, and any other Bidder so requested, must submit to Owner a list of the Subcontractors or Suppliers proposed for the following portions of the Work within five days after Bid opening: **for which such identification is required.**

~~A. [List key categories of the Work. Depending on the Project this might include electrical, fire protection, major equipment items].~~

- 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.
- 11.05 Subcontractors are required to provide proof of a Unique Entity Identifier (UEI) and active registration on SAM.gov prior to execution of Subcontract. It is strongly suggested that the Prime Bidder provide a list of Subcontractors (with UEI and proof of active registration, if available) that may/will be used on the project at the Bid opening, to expedite the verification process.**

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 in ink 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 ~~Base Bid with Alternates~~

- ~~A. Bidders must submit a Bid on a lump sum basis for the base Bid and include a separate price for each alternate described in the Bidding Documents and as provided for in the Bid Form. The price for each alternate will be the amount added to or deleted from the base Bid if Owner selects the alternate.~~
- ~~B. In the comparison of Bids, alternates will be applied in the same order of priority as listed in the Bid Form.~~

13.03 ~~Sectional Bids~~

- ~~A. Bidders may submit a Bid on any individual section or any combination of sections, as set forth in the Bid Form.~~
- ~~B. Submission of a Bid on any section signifies Bidder's willingness to enter into a Contract for that section alone at the price offered.~~
- ~~C. If Bidder submits Bids on individual sections and a Bid based on a combination of those sections, such combined Bid need not be the sum of the Bids on the individual sections.~~
- ~~D. Bidders offering a Bid on one or more sections must be capable of completing the Work covered by those sections within the time period stated in the Agreement.~~

13.04 Deleted

13.05 Unit Price

- A. Bidders must submit a Bid on a unit price basis for each item of Work listed in the unit price section of the Bid Form.
- B. The "Bid Price" (sometimes referred to as the extended price) for each unit price Bid item will be the product of the "Estimated Quantity", which Owner or its representative has set forth in the Bid Form, for the item and the corresponding "Bid Unit Price" offered by the Bidder. The total of all unit price Bid items will be the sum of these "Bid Prices"; such total will be used by Owner for Bid comparison purposes. The final quantities and Contract Price will be determined in accordance with Paragraph 13.03 of the General Conditions.
- C. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

13.06 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.~~

13.07 Deleted

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 Bid Form**.
- 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~~ **may** 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.
- A. **Bidder is required to provide proof of a Unique Entity Identifier (UEI) and active registration on SAM.gov prior to award of contract. It is strongly suggested that Bidders provide Organization's UEI and proof of active registration, if available, at the time of Bid Opening to expedite verification.**
- 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.
1. **Owner may also reject the Bid of any Bidder if Owner believes that it would not be in the best interest of the Project to make an award to that Bidder. Owner also reserves the right to waive all informalities and to negotiate contract terms with the Successful Bidder.**
- B. In the comparison of Bids, alternates will be applied in the same order of priority as listed in the Bid Form, **or as described in Section 01 10 00 – Special Provisions**. 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 determination of the apparent low Bidder(s) when sectional bids are submitted, Bids will be compared on the basis of the aggregate of the Bids for separate sections and the Bids for combined sections that result in the lowest total amount for all of the Work.~~
- D. 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.
- E. **Deleted**

F. Deleted

- 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, qualifications, and financial ability 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.

ARTICLE 21—SALES AND USE TAXES

- 21.01 **Owner is exempt from Nebraska state sales and use taxes on materials and equipment to be incorporated into some types of Work. The following types of work are examples and not all inclusive list of types of work where Contractor shall not include these taxes for materials and equipment:**

**Street and Road Improvements
Drainage Improvements
Sanitary Sewer
Wastewater Facilities**

**Excavation and Grading
Fire Hydrants
Swimming Pools
Trails**

ARTICLE 22—CONTRACTS TO BE ASSIGNED

- 22.01 **Refer to the Supplementary Conditions for additional information, if required.**

BEGINNING OF BID DOCUMENTS

SECTION 00 41 00
BID FORM FOR CONSTRUCTION CONTRACT

PROJECT IDENTIFICATION

Project Name: Walnut Creek Sewer Repair
JEO Project No.: 241729.00

NAME OF BIDDER

DATE

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:

City of Crete
Attn: Tom Ourada, City Administrator

1.02 **243 East 13th Street**
Crete, NE 68333

1.03 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;~~
- ~~F. Required Bidder Qualification Statement with supporting data; and~~

ARTICLE 3—BASIS OF BID

3.01 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

Item No.	Description	Quantity	Unit	Unit Price	Total
BASE BID					
1	Mobilization	1	LS		
2	Bonding and Insurance	1	LS		
3	Clearing and Grubbing	1	LS		
4	Tree Removal	3	EA		
5	Bypass Pumping	1	LS		
6	Remove Existing Sewer Pipe	66	LF		
7	Demolish Existing Support Piers	1	LS		
8	Remove Debris from Creek Bottom and Channel	1	LS		
9	Construct Temporary Orange Snow Fence	145	LF		
10	Construct Casing Support Piers	1	LS		
11	Construct 16" Steel Casing, Complete	1	LS		
12	Construct 8" Ductile Iron Pipe, RJ	66	LF		
13	Connect to Existing Sanitary Sewer	2	EA		
14	CCTV Inspection	383	LF		
15	Erosion Control Matting and Seeding	1	LS		
16	Straw Wattle	85	LF		
17	Temporary Traffic Control	1	LS		
TOTAL BASE BID					

EJCDC® C-410, Bid Form for Construction Contract.

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3.02 Bidder acknowledges that:

- A. each Bid Unit Price includes an amount considered by Bidder to be adequate to cover Contractor's overhead and profit for each separately identified item, and
- B. estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Work will be based on actual quantities, determined as provided in the Contract Documents.

~~ARTICLE 4—BASIS OF BID—COST PLUS FEE~~

Deleted

~~ARTICLE 5—PRICE PLUS TIME BID~~

Deleted

ARTICLE 6—TIME OF COMPLETION

6.01 Bidder agrees that the Work will be substantially complete and 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.

6.02 **Deleted**

6.03 **Deleted**

6.04 Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 7—BIDDER'S ACKNOWLEDGEMENTS: ACCEPTANCE PERIOD, INSTRUCTIONS, AND RECEIPT OF ADDENDA

7.01 *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.

7.02 *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.

7.03 *Receipt of Addenda*

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

Addendum Number	Addendum Date

7.04 ***Unique Entity Identifier (UEI) Verification on Federally Funded Projects***

- A. Bidder is highly recommended to provide proof of a Unique Entity Identifier (UEI) and active registration on SAM.gov at the time of the Bid opening. Such proof must be provided and will be verified prior to any award of contract.

ARTICLE 8—BIDDER’S REPRESENTATIONS AND CERTIFICATIONS

8.01 ***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~~ **is highly recommended to have** visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfied itself as to 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.
 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.

8.02 *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 Contact:

Name:

(typed or printed)

Title:

(typed or printed)

Phone:

Email:

Address:

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

SECTION 00 43 00
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: City of Crete Address <i>(principal place of business)</i> : 243 East 13th Street Crete, NE 68333	Bid Project <i>(name and location)</i> : Walnut Creek Sewer Repair Crete, Nebraska; JEO Project No. 241729.00 Bid Due Date:
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.

END OF BID DOCUMENTS

**SECTION 00 51 00
NOTICE OF AWARD**

Date of Issuance: **[Award Date]**

Owner: **City of Crete** Owner's Project No.:

Engineer: **JEO Consulting Group, Inc.** Engineer's Project No.: **241729.00**

Project: **Walnut Creek Sewer Repair**

Contract Name: **Walnut Creek Sewer Repair**

Bidder: **[Full formal name of Contractor]**

Bidder's Address: **[Contractor address]**

You are notified that Owner has accepted your Bid dated **[bid date]** for the above Contract, and that you are the Successful Bidder and are awarded a Contract for:

[Describe Work, alternates, or sections of Work awarded]

The Contract Price of the awarded Contract is \$**[Contract Price]**. Contract Price is subject to adjustment based on the provisions of the Contract, including but not limited to those governing changes, Unit Price Work, and Work performed on a cost-plus-fee basis, as applicable.

Three (3) 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 **three (3)** 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.
3. Other conditions precedent (if any): **None.**

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: **City of Crete**

By (signature): _____

Name (printed): **Dave Bauer**

Title: **Mayor**

Copy: Engineer

SECTION 00 52 00

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

This Agreement is by and between **City of Crete** ("Owner") and **[Full formal name of Contractor]** ("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 is generally described as follows: **Replacement of an existing 45' long 8" aerial sewer crossing in-kind.**

ARTICLE 2—THE PROJECT

- 2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows: **Walnut Creek Sewer Repair; Crete, Nebraska; JEO Project No. 241729.00.**

ARTICLE 3—ENGINEER

- 3.01 The Owner has retained **JEO Consulting Group, 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 **JEO Consulting Group, Inc.**

ARTICLE 4—CONTRACT TIMES

4.01 *Time is of the Essence*

- A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

4.02 *Contract Times: Days and Dates*

- A. The Work will be substantially complete within **90 calendar** days after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions and on or before **August 29, 2025**, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within **120 calendar** days after the date when the Contract Times commence to run and on or before **September 16, 2025**.

4.05 ~~*Special Damages*~~

- ~~A. Contractor shall reimburse Owner (1) for any fines or penalties imposed on Owner as a direct result of the Contractor's failure to attain Substantial Completion according to the Contract~~

~~Times, and (2) for the actual costs reasonably incurred by Owner for engineering, construction observation, inspection, and administrative services needed after the time specified in Paragraph 4.02 for Substantial Completion (as duly adjusted pursuant to the Contract), until the Work is substantially complete.~~

~~B. After Contractor achieves Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times, Contractor shall reimburse Owner for the actual costs reasonably incurred by Owner for engineering, construction observation, inspection, and administrative services needed after the time specified in Paragraph 4.02 for Work to be completed and ready for final payment (as duly adjusted pursuant to the Contract), until the Work is completed and ready for final payment.~~

~~C. The special damages imposed in this paragraph are supplemental to any liquidated damages for delayed completion established in this Agreement.~~

ARTICLE 5—CONTRACT PRICE

5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents, the amounts that follow, subject to adjustment under the Contract:

~~A. For all Work other than Unit Price Work, a lump sum of \$[number].~~

~~All specific cash allowances are included in the above price in accordance with Paragraph 13.02 of the General Conditions.~~

B. For all Unit Price Work, an amount equal to the sum of the extended prices (established for each separately identified item of Unit Price Work by multiplying the unit price times the actual quantity of that item).

Item No.	Description	Quantity	Unit	Unit Price	Total
BASE BID					
1	Mobilization	1	LS		
2	Bonding and Insurance	1	LS		
3	Clearing and Grubbing	1	LS		
4	Tree Removal	3	EA		
5	Bypass Pumping	1	LS		
6	Remove Existing Sewer Pipe	66	LF		
7	Demolish Existing Support Piers	1	LS		
8	Remove Debris from Creek Bottom and Channel	1	LS		

Item No.	Description	Quantity	Unit	Unit Price	Total
9	Construct Temporary Orange Snow Fence	145	LF		
10	Construct Casing Support Piers	1	LS		
11	Construct 16" Steel Casing, Complete	1	LS		
12	Construct 8" Ductile Iron Pipe, RJ	66	LF		
13	Connect to Existing Sanitary Sewer	2	EA		
14	CCTV Inspection	383	LF		
15	Erosion Control Matting and Seeding	1	LS		
16	Straw Wattle	85	LF		
17	Temporary Traffic Control	1	LS		
TOTAL BASE BID					

The extended prices for Unit Price Work set forth as of the Effective Date of the Contract are based on estimated quantities. As provided in Paragraph 13.03 of the General Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by Engineer.

- C. Total of Lump Sum Amount and Unit Price Work (subject to final Unit Price adjustment) \$[number].
- D. For all Work, at the prices stated in Contractor's Bid, attached hereto as an exhibit.

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 **15th** 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 Substantial 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) **Deleted**

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

- B. Upon Substantial Completion **of the entire construction to be provided under the construction Contract Documents**, 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 **125** 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 at Substantial Completion or any other time, 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 **12** 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 ~~(copy of list attached)~~.

6. Drawings (not attached but incorporated by reference) consisting of **9** sheets with each sheet bearing the following general title: **Walnut Creek Sewer Repair**.
- ~~7. Drawings listed on the attached sheet index.~~
8. Addenda (numbers **[number]** to **[number]**, inclusive).
9. Exhibits to this Agreement (enumerated as follows):
 - a. **Contractor's Bid.**
10. 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.
11. **Equipment Assessment Certification.**
- 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.
- B. **If Owner is a public entity in the State the Project is located, then Contractor shall register with and use the E-Verify Program, or an equivalent federal program designated by the United States Department of Homeland Security or other federal agency authorized to verify the work eligibility status of a newly hired employee pursuant to the Immigration Reform and Control Act of 1986, to determine the work eligibility status of new employees physically performing services within the State of the Project is located. Contractor shall require the same of each subcontractor.**
- C. **If Owner is a public entity in the State the Project is located, or the Project is fully or partially funded by State or Federal monies, then Contractor and its subcontractors shall not discriminate against any employee or applicant for employment, to be employed in the performance of this Agreement, with respect to the person’s hire, tenure, terms, conditions, or privileges of employment, because of the person’s race, color, religion, sex, disability, or national origin in accordance with all applicable State and Federal laws and regulations.**

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

This Agreement will be effective on **[Award Date]** (which is the Effective Date of the Contract).

Owner:

City of Crete

(typed or printed name of organization)

By:

(individual's signature)

Date:

(date signed)

Name: **Dave Bauer**

(typed or printed)

Title: **Mayor**

(typed or printed)

Contractor:

[Full formal name of Contractor]

(typed or printed name of organization)

By:

(individual's signature)

Date:

(date signed)

Name:

(typed or printed)

Title:

(typed or printed)

*(If **Contractor** is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)*

Address for giving notices:

243 East 13th Street

Crete, NE 68333

Address for giving notices:

[Contractor address]

Designated Representative:

Name:

(typed or printed)

Title:

(typed or printed)

Address:

Designated Representative:

Name:

(typed or printed)

Title:

(typed or printed)

Address:

Phone:

Email:

Phone:

Email:

License No.:

(where applicable)

State:

EQUIPMENT ASSESSMENT CERTIFICATION

BY REQUIREMENT OF NEBRASKA STATE STATUTE 77-1323, THE FOLLOWING INFORMATION
MUST BE FURNISHED BY ALL CONTRACTORS AND SUBCONTRACTORS UTILIZING ANY EQUIPMENT ON
ANY AND ALL PUBLIC IMPROVEMENT CONTRACTS.

I certify to the best of my knowledge and belief, all the information on this form is correct. All
equipment to be used on JEO Project No. 241729.00, except that acquired since the assessment date, has
been assessed for taxation for the current year in _____ County.

Name of Company _____

Authorized Official _____
(Print Name)

(Signature)

Title _____

Date _____

Owner:	<u>City of Crete</u>	Owner's Project No.:	<u> </u>
Engineer:	<u>JEO Consulting Group, Inc.</u>	Engineer's Project No.:	<u>241729.00</u>
Contractor:	<u>[Full formal name of Contractor]</u>	Contractor's Project No.:	<u> </u>
Project:	<u>Walnut Creek Sewer Repair</u>		
Contract Name:	<u>Walnut Creek Sewer Repair</u>		
Effective Date of Contract:	<u>[Award Date]</u>		

On that date, Contractor shall start performing its obligations under the Contract Documents. No Work will be done at the Site prior to such date.

The Work will be substantially complete within **90 calendar** days after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions and on or before **August 29, 2025**, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within **120 calendar** days after the date when the Contract Times commence to run and on or before **September 16, 2025**.

[Note any access limitations, security procedures, or other restrictions]

Owner: City of Crete

By (*signature*): _____

Name (*printed*): Dave Bauer

Title: Mayor

Date Issued: _____

Copy: Engineer

SECTION 00 61 00 PERFORMANCE BOND

Contractor Name: [Full formal name of Contractor] Address <i>(principal place of business)</i> : [Address of Contractor's principal place of business]	Surety Name: Address <i>(principal place of business)</i> :
Owner Name: City of Crete Mailing address <i>(principal place of business)</i> : 243 East 13th Street Crete, NE 68333	Contract Description <i>(name and location)</i> : Walnut Creek Sewer Repair Crete, Nebraska; JEO Project No. 241729.00 Contract Price: [Amount, from Contract] Effective Date of Contract: [Award Date]
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
By: _____ <i>(Full formal name of Contractor)</i> _____ <i>(Signature)</i> Name: _____ _____ <i>(Printed or typed)</i> Title: _____ Attest: _____ _____ <i>(Signature)</i> Name: _____ _____ <i>(Printed or typed)</i> Title: _____	By: _____ <i>(Full formal name of Surety) (corporate seal)</i> _____ <i>(Signature)(Attach Power of Attorney)</i> Name: _____ _____ <i>(Printed or typed)</i> Title: _____ Attest: _____ _____ <i>(Signature)</i> Name: _____ _____ <i>(Printed or typed)</i> Title: _____
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.	

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**

SECTION 00 61 50 PAYMENT BOND

Contractor Name: [Full formal name of Contractor] Address <i>(principal place of business)</i> : [Address of Contractor's principal place of business]	Surety Name: Address <i>(principal place of business)</i> :
Owner Name: City of Crete Mailing address <i>(principal place of business)</i> : 243 East 13th Street Crete, NE 68333	Contract Description <i>(name and location)</i> : Walnut Creek Sewer Repair Crete, Nebraska; JEO Project No. 241729.00 Contract Price: [Amount, from Contract] Effective Date of Contract: [Award Date]
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> <hr/>	<i>(Full formal name of Surety) (corporate seal)</i> <hr/>
By: <hr/> <div style="text-align: center;"><i>(Signature)</i></div>	By: <hr/> <div style="text-align: center;"><i>(Signature)(Attach Power of Attorney)</i></div>
Name: <hr/> <div style="text-align: center;"><i>(Printed or typed)</i></div>	Name: <hr/> <div style="text-align: center;"><i>(Printed or typed)</i></div>
Title: <hr/>	Title: <hr/>
Attest: <hr/> <div style="text-align: center;"><i>(Signature)</i></div>	Attest: <hr/> <div style="text-align: center;"><i>(Signature)</i></div>
Name: <hr/> <div style="text-align: center;"><i>(Printed or typed)</i></div>	Name: <hr/> <div style="text-align: center;"><i>(Printed or typed)</i></div>
Title: <hr/>	Title: <hr/>
<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**

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

SECTION 00 70 00
STANDARD GENERAL CONDITIONS
OF THE CONSTRUCTION CONTRACT

Prepared By



Endorsed By



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National Society of Professional Engineers
1420 King Street, Alexandria, VA 22314-2794
(703) 684-2882
www.nspe.org

American Council of Engineering Companies
1015 15th Street N.W., Washington, DC 20005
(202) 347-7474
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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.

SECTION 00 73 00
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

2.02 *Copies of Documents*

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

Owner shall furnish to Contractor one paper copy of the fully executed agreement if the agreement is not signed electronically, or else the Contractor shall be furnished one copy in electronic portable document format (PDF) of the fully executed agreement. Additional printed copies will be furnished upon request, at the cost of reproduction.

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

SC-2.04 Amend the last sentence of Paragraph 2.04.B. to read as follows:

Such individuals shall have the authority to transmit and receive information, and act as the point of contact on behalf of each respective party.

2.06 *Electronic Transmittals*

SC-2.06 Add a new paragraph immediately after Paragraph 2.06.C:

- D. The electronic transmittal protocol shall be the following:
1. Documents shall be transferred between Owner, Engineer and Contractor through the designated authorized representative, as determined at the preconstruction conference.
 2. If a web based, or other cloud based document transfer service is to be utilized for the Project, the Owner, Engineer and Contractor shall jointly determine the representatives for each party that may have access and specific authorizations within the document transfer service. If either party desires to make modifications to their representatives, and authorities of such, written notice shall be provided to all parties. The specifications shall designate which party is responsible for the cost of said service, if required.

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

No suggested Supplementary Conditions in this Article.

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

SC-4.01.A Delete the last sentence of paragraph.

4.03 *Reference Points*

SC-4.03.A Delete Paragraph 4.03A in its entirety and insert the following in its place:

- A. Engineer shall provide engineering surveys to establish reference points and the general layout of the work, which in Engineer's judgment are necessary to enable Contractor to proceed with the work. Contractor shall give Engineer at least 72 hours' notice prior to needing staking.
- B. Engineer will set stakes for horizontal and vertical control and alignment and elevations for the aerial sewer crossing replacement in one (1) trip.
- C. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points, construction stakes and property monuments, and shall make no changes or relocations without the prior written approval of the Owner.
- D. Contractor shall report to Engineer whenever any reference point, construction stakes, or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the payment to Owner to replace or relocate such reference points, construction stakes, or property monuments. Such payment shall be paid prior to the Contractor's final estimate or shall be deducted from the same.
- E. All improvements shall be installed as staked by the Engineer. The locations as shown on the plans should be considered approximate.

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
None		

- 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
None		

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
None		

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
None		

ARTICLE 6—BONDS AND INSURANCE

6.03 Contractor's Insurance

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

- D. *Other Additional Insureds:* As a supplement to the provisions of Paragraph 6.03.C of the General Conditions, the commercial general liability, automobile liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies must include as additional insureds (in addition to Owner and Engineer) the following: None, unless listed here.
- E. *Workers' Compensation and Employer's Liability:* Contractor shall purchase and maintain workers' compensation and employer's liability insurance, including, as applicable, United States Longshoreman and Harbor Workers' Compensation Act, Jones Act, stop-gap employer's liability coverage for monopolistic states, and foreign voluntary workers' compensation (from available sources, notwithstanding the jurisdictional requirement of Paragraph 6.02.B of the General Conditions).

Workers' Compensation and Related Policies	Policy limits of not less than:
Workers' Compensation	
State	Statutory

Workers' Compensation and Related Policies	Policy limits of not less than:
Applicable Federal (e.g., Longshoreman's)	Statutory
Foreign voluntary workers' compensation (employer's responsibility coverage), if applicable	Statutory
Jones Act (if applicable)	
Bodily injury by accident—each accident	\$500,000
Bodily injury by disease—aggregate	\$500,000
Employer's Liability	
Each accident	\$500,000
Each employee	\$500,000
Policy limit	\$500,000

- F. *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	\$2,000,000
Products—Completed Operations Aggregate	\$1,000,000
Personal and Advertising Injury	\$1,000,000
Bodily Injury and Property Damage—Each Occurrence	\$1,000,000

- 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	\$ 500,000
Each Accident	\$1,000,000
Property Damage	
Each Accident	\$1,000,000
[or]	
Combined Single Limit	
Combined Single Limit (Bodily Injury and Property Damage)	\$1,000,000

- K. *Umbrella or Excess Liability*: Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the Paragraphs above. The coverage afforded must be at least as broad as that of each and every one of the underlying policies.

Excess or Umbrella Liability	Policy limits of not less than:
Each Occurrence	\$1,000,000
General Aggregate	\$2,000,000

- L. *Using Umbrella or Excess Liability Insurance to Meet CGL and Other Policy Limit Requirements*: Contractor may meet the policy limits specified for employer's liability, commercial general liability, and automobile liability through the primary policies alone, or through combinations of the primary insurance policy's policy limits and partial attribution of the policy limits of an umbrella or excess liability policy that is at least as broad in coverage as that of the underlying policy, as specified herein. If such umbrella or excess liability policy was required under this Contract, at a specified minimum policy limit, such umbrella or excess policy must retain a minimum limit of \$1,000,000 after accounting for partial attribution of its limits to underlying policies, as allowed above.

6.04 *Builder's Risk and Other Property Insurance*

SC-6.04.A Delete paragraph 6.04.A in its entirety and insert the following in its place:

- A. *Builder's Risk*: Owner shall not be responsible for purchasing and maintaining any property insurance to protect the interests of Contractor, subcontractors, or others in the Work. Unless otherwise agreed in writing between Owner and Contractor, and until final completion of the Work and acceptance of the Work in accordance with paragraph 15.03 of the General Conditions, all risk of loss with no right of recovery against the Owner, Engineer, Engineer's consultants (and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them) will be borne by Contractor, subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage, each may purchase it and maintain it at the purchaser's own expense.

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

7.05 *"Or Equals"*

SC-7.05.A.1.a.3 – Amend the last sentence of Paragraph a.3 by striking out "and;" and adding a period at the end of Paragraph a.3.

SC-7.05.A.1.a.4 – Delete paragraph in its entirety and insert "Deleted."

ARTICLE 8—OTHER WORK AT THE SITE

No suggested Supplementary Conditions in this Article.

ARTICLE 9—OWNER'S RESPONSIBILITIES

No suggested Supplementary Conditions in this Article.

ARTICLE 10—ENGINEER'S STATUS DURING CONSTRUCTION

10.03 *Resident Project Representative*

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. *General:* RPR's dealings in matters pertaining to the Work in general shall be with Engineer and Contractor. RPR's dealings with Subcontractors shall only be through or with the full knowledge and approval of Contractor. RPR shall generally communicate with Owner only with the knowledge of and under the direction of Engineer.
 - 2. *Schedules:* Review the progress schedule, schedule of Shop Drawing and Sample submittals, and Schedule of Values prepared by Contractor and consult with Engineer concerning acceptability.
 - 3. *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.
 - 4. *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.
 - 5. *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.
 - 6. *Interpretation of Contract Documents:* Report to Engineer when clarifications and interpretations of the Contract Documents are needed and transmit to Contractor clarifications and interpretations as issued by Engineer.
 - 7. *Shop Drawings and Samples*
 - a. Record date of receipt of Samples and Contractor-approved Shop Drawings.
 - b. Receive Samples which are furnished at the Site by Contractor, and notify Engineer of availability of Samples for examination.
 - c. Advise Engineer and Contractor of the commencement of any portion of the Work requiring a Shop Drawing or Sample submittal for which RPR believes that the submittal has not been approved by Engineer.

8. *Modifications:* Consider and evaluate Contractor's suggestions for modifications in Drawings or Specifications and report such suggestions, together with RPR's recommendations, if any, to Engineer. Transmit to Contractor in writing decisions as issued by Engineer.
9. *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.
10. *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.
11. *Records*
 - a. Prepare a daily report or keep a diary or log book, recording Contractor's hours on the Site, Subcontractors present at the Site, weather conditions, data relative to questions of Change Orders, Field Orders, Work Change Directives, or changed conditions, Site visitors, deliveries of equipment or materials, daily activities, decisions, observations in general, and specific observations in more detail as in the case of observing test procedures; and send copies to Engineer.
 - b. Record names, addresses, fax numbers, e-mail addresses, web site locations, and telephone numbers of all Contractors, Subcontractors, and major Suppliers of materials and equipment.
 - c. Maintain records for use in preparing Project documentation.
12. *Reports*
 - a. Furnish to Engineer periodic reports as required of progress of the Work and of Contractor's compliance with the Progress Schedule and schedule of Shop Drawing and Sample submittals.
 - b. Draft and recommend to Engineer proposed Change Orders, Work Change Directives, and Field Orders. Obtain backup material from Contractor.
 - c. Immediately notify Engineer of the occurrence of any Site accidents, emergencies, acts of God endangering the Work, force majeure or delay events, damage to property by fire or other causes, or the discovery of any Constituent of Concern or Hazardous Environmental Condition.
13. *Payment Requests:* Review Applications for Payment with Contractor.

14. *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 THE WORK; ALLOWANCES; UNIT PRICE WORK

13.01 *Cost of the Work*

SC-13.01 Supplement Paragraph 13.01.B.5.c.(2) by adding the following sentence:

The equipment rental rate book that governs the included costs for the rental of machinery and equipment owned by Contractor (or a related entity) under the Cost of the Work provisions of this Contract is the most current edition of Rental Rate Blue Book for Construction Equipment.

SC-13.01 Supplement Paragraph 13.01.C.2 by adding the following definition of small tools and hand tools:

- a. For purposes of this paragraph, “small tools and hand tools” means any tool or equipment whose current price if it were purchased new at retail would be less than \$500.

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:
 - a. the extended price of a particular item of Unit Price Work amounts to 15 percent or more of the Contract Price (based on estimated quantities at the time of Contract formation) and the variation in the quantity of that particular item of Unit Price Work actually furnished or performed by Contractor differs by more than 15 percent 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

No suggested Supplementary Conditions in this Article.

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

15.01 *Progress Payments*

SC-15.01.B Amend paragraph 15.01.B.1 by striking out the following text: “At least 20 days before the date established in the agreement for each progress payment” and insert “At least 10 days before the date established in the agreement for consideration of each progress payment.”

SC-15.01.D Amend the first sentence of paragraph 15.01.D.1 by striking out the following text: “ten” and replacing it with “30”.

15.06 *Final Payment*

SC-15.06.A.2 – Amend paragraph 15.06.A.2.e to read as follows:

- e. if requested by Owner, complete and legally effective releases and waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and the Liens filed in connection with the Work.

ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

No suggested Supplementary Conditions in this Article.

ARTICLE 17—FINAL RESOLUTION OF DISPUTES

No suggested Supplementary Conditions in this Article.

ARTICLE 18—MISCELLANEOUS

SC-18.11 – Add new paragraph immediately after Paragraph 18.10:

18.11 *Environmental Requirements*

A. When constructing a Project involving trenching and/or other related earth excavations, Contractor shall comply with the following environmental conditions:

1. Wetlands – When disposing of excess, spoil, or other Construction Materials on public or private property, Contractor shall not fill in or otherwise convert wetlands.
2. Floodplains – When disposing of excess, spoil, or other Construction Materials on public or private property, Contractor shall not fill in or otherwise convert 100-year floodplain areas (Standard Flood Hazard Area) delineated on the latest Federal Emergency Management Agency Floodplain Maps, or other appropriate maps, e.g., alluvial soils on NRCS Soil Survey Maps.
3. Historic Preservation – Any excavation by Contractor that uncovers a historical or archaeological artifact or human remains shall be immediately reported to Owner and a representative of Agency. Construction shall be temporarily halted pending the notification process and further directions issued by Agency after consultation with the State Historic Preservation Officer (SHPO).
4. Endangered Species – Contractor shall comply with the Endangered Species Act, which provides for the protection of endangered and/or threatened species and critical habitat. Should any evidence of the presence of endangered and/or threatened species or their critical habitat be brought to the attention of Contractor, Contractor will immediately report this evidence to Owner and a representative of Agency. Construction shall be temporarily halted pending the notification process and further directions issued by Agency after consultation with the U.S. Fish and Wildlife Service.
5. Mitigation Measures – The following environmental mitigation measures are required on this Project: None.

SECTION 00 74 00

FEDERAL, STATE, LOCAL, AND FUNDING REQUIREMENTS

These Federal, State, Local, and Funding Requirements supplement EJCDC® C-700, Standard General Conditions of the Construction Contract (2018) and EJCDC® C-800, Supplementary Conditions of the Construction Contract (2018). The General Conditions remain in full force and effect except as amended.

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Equal Employment Opportunity

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, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to the following: Employment, 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 considerations for employment without regard to race, color, religion, sex, or national origin.
- (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 as 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.
- (7) 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.

Compliance with the Copeland "Anti-Kickback" Act.

- (1) 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.
- (2) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clause above and such other clauses as the Federal agency may by appropriate instructions require, and also 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.
- (3) 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.

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 (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 (1) of this section, in the sum of \$10 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 (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 (2) of this section.
- (4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (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 (1) through (4) of this section.

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 the state agency or local or Indian tribal government) and understands and agrees that the (name of the state agency or local or Indian tribal government) will, in turn, report each violation as required to assure notification to the (name of recipient), the Federal funding agency, and the appropriate Environmental Protection Agency Regional Office.
- (3) The contractor agrees to include these requirements in each subcontract exceeding \$100,000 financed in whole or in part with Federal assistance.

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 et seq.
- (2) The contractor agrees to report each violation to the (name of the state agency or local or Indian tribal government) and understands and agrees that the (name of the state agency or local or Indian tribal government) will, in turn, report each violation as required to assure notification to the (name of recipient), the Federal funding agency, and the appropriate Environmental Protection Agency Regional Office.
- (3) The contractor agrees to include these requirements in each subcontract exceeding \$100,000 financed in whole or in part with Federal assistance.

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, its 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 subrecipient). 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 (name of state agency serving as recipient and name of subrecipient), 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, 31 U.S.C. § 1352 (as amended)

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.

Procurement of Recovered Materials

- (1) 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:
 - (i) Competitively within a timeframe providing for compliance with the contract performance schedule;
 - (ii) Meeting contract performance requirements; or
 - (iii) At a reasonable price.
- (2) Information about this requirement is available at EPA's Comprehensive Procurement Guidelines web site, <http://www.epa.gov/cpg/> . The list of EPA-designate items is available at <http://www.epa.gov/cpg/products.htm> .

Access to Records

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), the Federal funding agency Administrator, 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 Federal funding agency Administrator or his authorized representatives access to construction or other work sites pertaining to the work being completed under the contract.

Contracting with Small, Minority and Women's Businesses

- (1) If the contractor intends to let any subcontracts for a portion of the work, the contractor shall take affirmative steps to assure that small, minority and women's businesses are used when possible as sources of supplies, equipment, construction, and services.
- (2) Affirmative steps shall consist of:
 - (i) Placing qualified small and minority businesses and women's business enterprises on solicitation lists;
 - (ii) Ensuring that small and minority businesses and women's business enterprises are solicited whenever they are potential sources;

- (iii) Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority businesses and women's business enterprises;
- (iv) Establishing delivery schedules, where the requirements of the contract permit, which encourage participation by small and minority businesses and women's business enterprises;
- (v) Using the services and assistance of the U.S. Small Business Administration, the Minority Business Development Agency of the U.S. Department of Commerce, and State and local governmental small business agencies;
- (vi) Requiring each party to a subcontract to take the affirmative steps of this section; and
- (vii) The contractor is encouraged to procure goods and services from labor surplus area firms.

SECTION 01 10 00
SPECIAL PROVISIONS

PART 1 - GENERAL

These Special Provisions amend or supplement the following Specifications and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect.

The terms used in these Special Provisions will have the meanings indicated in the Specifications and Contract Documents. Additional terms used in these Special Provisions have the meanings indicated below, which are applicable to both the singular and plural thereof.

1.01 PROJECT CONTACT

- A. Owner's Primary Contact:
 - 1. Name: Tom Ourada
 - 2. Address: City Hall, 243 East 13th St Crete, NE 68333
 - 3. Phone Number: 402.826.4312
 - 4. Email: tom.ourada@crete.ne.gov
- B. Owner's Secondary Contact:
 - 1. Name: Jesse Yager
 - 2. Address: Water Department Shop, 320 West 9th St Crete NE, 68333
 - 3. Phone Number: 402.418.8078
 - 4. Email: jesse.yager@crete.ne.gov
- C. Engineer's Primary Contact:
 - 1. Name: Aaron Beauclair, PE
 - 2. Address: 2000 Q St Suite 500, Lincoln, NE 68503
 - 3. Cell Number: 402.413.9813
 - 4. Email: abeauclair@jeo.com
- D. Engineer's Secondary Contact:
 - 1. Name: Dane Simonsen, PE
 - 2. Address: 2000 Q St Suite 500, Lincoln, NE 68503
 - 3. Phone Number: 402.435.3080
 - 4. Email: dsimonsen@jeo.com

1.02 BID FORM

- A. Bidders are required to bid Base Bid and ALL Alternates if any.

1.03 CONTRACT DESCRIPTION

- A. Contract type: One Contract for construction of Base Bid and such alternates as Owner may select, based on what Owner believes to be in the best interest of Owner and the funds available for the work.

1.04 CONTRACT DRAWINGS AND SPECIFICATIONS

- A. The Drawings, Specifications, Proposal, Special Provisions, and all supplementary documents are intended to describe the complete work and are essential parts of the Contract. All requirements occurring in any of them are binding.
- B. In cases where there is a discrepancy in the contract documents.
 - 1. Written dimensions take precedence over scaled dimensions on Drawings.
 - 2. Larger scale Drawings take precedence over smaller scale Drawings.
 - 3. Section 01 10 00 – Special Provisions, take precedence over the Drawings.
 - 4. Section 01 10 00 – Special Provisions, take precedence over other Specification Sections.
- C. Referenced Sections:
 - 1. Any Specification Section that is referenced by another Specification Section and is not included in the project specifications (see table of contents for complete listing) shall not apply to this project.
- D. At least one copy of all Drawings and Specifications shall be maintained by Contractor at the project site and these shall be accessible at all times to Owner and Engineer.

1.05 REPORTS

- A. Refer to Section 00 73 00 – Supplementary Conditions, paragraphs SC-5.03 and SC-5.06.

1.06 PERMITS

- A. CITY OF CRETE FLOODPLAIN AND FLOODWAY DEVELOPMENT: A floodplain/floodway development permit is being processed by the City of Crete Floodplain Administrator. A copy of the permit will be presented to the successful bidder. Contractor will construct the proposed improvements in strict compliance to the instructions and provisions of the permit.

1.07 CODE COMPLIANCE

- A. All proposed work shall comply with the National Plumbing Code, National Electrical Code, International Building Code and all applicable state and local codes.

1.08 SPECIAL FUNDING

- A. This project is being partially funded by the American Rescue Plan Act funds. Contractor shall comply with all requirements of that program. These requirements are summarized in Section 00 74 00 - Federal, State, Local, and Funding Requirements.

1.09 MEASUREMENTS AND PAYMENTS

- A. The bid item “Clearing and Grubbing” shall include all components, including labor and materials, necessary to remove trees, shrubs, vegetation, and debris necessary to install the proposed casing and sewer line as shown in the Drawings. This bid item shall include, but is not limited to excavation, removal, and disposal of trees and vegetation. Specific trees shown on the Drawings for removal will be paid for separately from this bid item. Quantities will not be measured and it will be paid as a Lump Sum.
- B. The bid item “Bypass Pumping” shall include all components, including labor, materials, equipment, and tools necessary to design, setup, operate, and teardown bypass pumping equipment. Bypass pumping shall be limited to a maximum of 45 consecutive days from the first day of diversion through the last day of diversion. This bid item shall include, but is not limited to design, setup, operation, disinfection, teardown, pumps, piping, valves,

fuel, plugs, system modifications and restoration. Quantities will not be measured and it will be paid as a Lump Sum.

- C. The bid item "Demolish Existing Support Piers" shall include all components, including labor, materials, equipment, and tools necessary to remove the existing support piers as shown on the drawings. Existing piers are to be removed if they are less than 3 ft deep. If greater than 3 ft deep, the top 3 ft shall be removed and the remainder abandoned in place. CONTRACTOR SHALL NOT DISTURB THE GROUND DEEPER THAN 3 FT TO PREVENT STREAM BANK DESTABILIZATION. Quantities will not be measured and will be paid as a Lump Sum.
- D. The bid item "Remove Debris from Creek Bottom and Channel" shall include all components, including labor, materials, equipment, and tools necessary to remove fallen piers, piping, steel cables, old infrastructure, etc that has been abandoned in the creek bottom in the immediate vicinity of the improvements. It is not intended that the contractor remove organic materials such as branches, leaves, etc. Quantities will not be measured and will be paid as a Lump Sum.
- E. The bid item "Construct Casing Support Piers" shall include all components, including labor, materials, equipment, and tools necessary to construct the support piers for the proposed casing as shown on the Drawings. Quantities will not be measured and will be paid as a Lump Sum.
- F. The bid item "Construct 16" Steel Casing, Complete" shall include all components, including labor, materials, equipment, and tools necessary to construct the 16" steel pipe as shown on the Drawings. Quantities will not be measured and will be paid as a Lump Sum.
- G. The bid item "Temporary Traffic Control" shall include all components, including labor and materials, necessary to provide traffic control during construction. This bid item shall include, but is not limited to, signage, cones, setup, operation, teardown, etc. Quantities will not be measured and it will be paid as a Lump Sum.

1.10 INCIDENTAL AND SUBSIDIARY ITEMS OF WORK

- A. Any items or materials called for on the Drawings or in these Specifications that are not measured and paid for directly shall be considered incidental and subsidiary to other items of work for which direct payment is made.

1.11 PROJECT CONDITIONS

- A. Existing Utilities:
 - 1. There are utilities in the vicinity of the proposed work.
 - 2. Contractor shall notify the respective utility company(s) and/or "one-call notification center" before commencing work.
 - 3. Neither Owner nor Engineer assumes any responsibility for utility locations being accurately shown, or not shown on the Drawings.
 - 4. Any reference to utilities in the Drawings is approximate. Contractor shall verify the location of any existing utilities within the vicinity of the proposed work.
 - 5. Contractor shall provide notification of intent to begin construction in advance to allow utility company(s) sufficient time to locate or relocate their utilities.

6. Once the location of the utility(s) has been staked, located or marked, it shall be Contractor's responsibility to protect these stakes/markings. Any costs for restaking or remarking shall be Contractor's expense.
 7. Contractor shall avoid damaging any utility(s). Any such damage caused by Contractor, Contractor's employees, subcontractors, suppliers or agents will be the responsibility of Contractor to repair at Contractor's expense. No additional compensation will be allowed for protecting utility(s) or for repair of any damage caused by Contractor, Contractor's employees, subcontractors, suppliers or agents.
 8. Contractor shall coordinate utility relocation or reconstruction with the appropriate utility company.
- B. Maintain Continuous Sanitary Sewer Service:
1. Whenever possible, Contractor shall schedule and conduct all work in a sequence, which will provide continuous operation of the sanitary sewer system. Contractor's schedule of planned operations shall outline compliance with this requirement.
 2. When it is necessary to temporarily interrupt sewer service to any user:
 - a. Contractor shall limit shutdown to 4 hours maximum time.
 - b. Contractor shall make arrangement with Owner at least 48 hours in advance of any shutdown.
 - c. Contractor shall get approval of any shutdown from Owner at least 48 hours in advance of the shutdown.
 - d. Contractor shall give notification to any effected user at least 48 hours in advance of the shutdown. Such notification shall be closely coordinated with Owner.
 3. Contractor shall provide any temporary pumping of sewer flows necessary to provide continuous service to the users. Discharging of untreated wastewater during the construction will not be allowed. Contractor's schedule of planned operations shall outline compliance with this requirement.

1.12 SUBMITTALS

- A. Refer to Section 01 30 00 – Administrative Requirements.
- B. All submittals shall be submitted to the Engineer in digital pdf format.
- C. Engineer will review and issue approvals digitally.
- D. Refer to Section 01 30 00 – Administrative Requirements, paragraph 3.05.B, references to printing and distribution shall be replaced with digital distribution in a pdf or other approved format. A field office is not required on this project.

1.13 RECORD DRAWINGS

- A. Contractor shall provide two (2) copies of the record drawings/as-builts clearly marking the field adjustments, additions/deletions to the Drawings, and locations of all buried piping/infrastructure and critical elevations of same.

1.14 SPECIAL EVENTS

- A. There are no special events planned in the area of construction activities.

1.15 RIGHT-OF-WAY/EASEMENTS

- A. The project shall be constructed within limited easements, right-of-way and property owned by Owner, as shown on the Drawings.
- B. Contractor shall confine all operations to areas within the limited easements, right-of-way and property owned by Owner, as shown on the Drawings.
- C. Areas outside of the limited easements, right-of-way and existing property owned by Owner, as shown on the Drawings, are not to be disturbed.
- D. Contractor shall exercise all reasonable care in any activities that are conducted in the areas of right of way and easement, to minimize damages to the property. Contractor's attention is specifically called to any buildings, trees, fences, drainage structures and other miscellaneous appurtenances to the property.
- E. Contractor shall be solely and completely responsible for any damages caused by Contractor, Contractor's employees, sub-Contractors, suppliers or agents to any areas outside of the limited easements, right-of-way and existing property owned by Owner, as shown on the Drawings.
- F. Contractor shall be solely responsible for obtaining and shall pay all costs in connection with any additional work area, storage site, access to the site, or temporary right-of-way, which may be required for proper completion of the work.
- G. Staging Area: Contractor may use the staging area shown on the plans for storage of materials and equipment.

1.16 SITE ADMINISTRATION

- A. Contractor shall be responsible for all areas of the site used by him and by all Sub-Contractors in the performance of the work. He will exert full control over the actions of all employees and other persons with respect to the use and preservation of the property and existing facilities, except such controls as may be specifically reserved to Owner or others. Contractor has the right to exclude from the site all persons who have no purpose related to the work or its inspection, and may require all persons on the site (except Owner's employees) to observe the same regulations as he requires of his employees.
- B. Contractor may use the area within the limited easements, right-of-way and property owned by Owner, as shown on the Drawings, for storage and staging, but must not interfere with normal operations of Owner, without prior written approval from Owner.

1.17 POWER

- A. All power for lighting, construction use, operation of Contractor's plant or equipment, or for any other use by Contractor, shall be provided by Contractor at his sole cost and expense and shall be considered incidental and subsidiary to other items of work for which direct payment is made. No separate payments will be made for this work.

1.18 MONTHLY PROGRESS MEETINGS

- A. Monthly progress review meetings will be held during the construction period at a time and date set by Owner through Engineer. Location will be determined at the pre construction meeting. Attendance by Contractor or his/her authorized representative is mandatory.

1.19 TEMPORARY FACILITIES

- A. Temporary fencing will be required as shown on the plans.

- B. Temporary facilities shall be considered incidental and subsidiary to other items of work for which direct payment is made. No separate payments will be made for this work.

1.20 HISTORICAL AND ARCHAEOLOGICAL

- A. If, during the course of construction, evidence of deposits of historical or archaeological interest is found, Contractor shall cease operations affecting the find and shall notify Owner. No further disturbance of the deposits shall ensue until Contractor has been notified by Owner that Contractor may proceed. Compensation to Contractor, if any, for lost time or changes in construction resulting from the find shall be determined in accordance with changed or extra work provisions of the Contract Documents.

1.21 SUBSTANTIAL COMPLETION

- A. Refer to Section 00 70 00 – General Conditions.
- B. Substantial Completion so that the Work can be utilized requires the following components to be complete, operational and tested:
 - 1. Earthwork, Excluding Final Fine Grading.
 - 2. Above Grade and Below Grade Piping and Connections Upstream and Downstream.
 - 3. Pipe Support Casing.

PART 2 - PRODUCTS

The following information in **PART 2 - PRODUCTS** is provided to identify specific product selections required for this project and/or to augment requirements of products that may be specified in later specification sections.

2.01 CONCRETE

- A. Compressive Strength When Tested in Accordance with ASTM C39 at 28 Days: Minimum 3,000 psi.
 - 1. Type 47B Traditional Mix, 30% Type E Aggregate Per NDOT Standard Specification.
 - a. IP cement is acceptable.
 - 2. Concrete mix design shall have a minimum of 30% coarse aggregate.
 - 3. Air content shall be 6.5% to 9.0%.

2.02 SEEDING

- A. Seed Mixture for Rural Areas: 100 lbs/acre (drill seeded) of the following composition:

	<u>Percent of Mix</u>
Tall Fescue	45.00
Perennial Ryegrass	40.00
Cover Crop	15.00

2.03 EARTHEN SOILS

- A. Off-site borrow material is not anticipated to be needed for project construction. However, if necessary, the Contractor may retrieve additional soils from an offsite location of their choosing.
 - 1. Fill material shall be a clean, inorganic silt or lean clay with a liquid limit less than 45 and a plasticity index less than 20. Fill material shall not contain an appreciable

amount of roots, rock, or debris, and should not contain any foreign material with a dimension greater than 3 inch.

2. No payments will be made for the use of off-site borrow material.

2.04 SANITARY SEWER

A. Ductile Iron Pipe (DIP):

1. Pressure Class 350 (3" to 12" diameter) or Pressure Class 250 (14" to 48" diameter) with restrained mechanical joints. Pipe must meet all requirements of AWWA C151 and joints must meet all requirements of AWWA C111. All buried pipe shall be polywrapped.
2. Interior Coating: All ductile iron pipe shall be coated on the interior with a Ceramic Novaloc Epoxy product.
 - a. Interior coating shall have a maximum allowable deflection that meets or exceeds the maximum allowable deflection of cement-mortar lining without damage to the coating.
 - b. Approved Manufacturers:
 - (1) Induron – Protecto 401
 - (2) Permite – Permax-CTF
 - c. Application:
 - (1) Surface prep to remove all oils, small deposits of asphalt paint and grease by solvent cleaning (NAPF 500-03-01). Abrasive blast to meet NAPF 500-03-04.
 - (2) Factory apply to a dry film thickness of 40.0 to 45.0 mils at a minimum of 50 degrees F.
 - d. Surface prep and apply coating system according to manufacturer's requirements.
 - e. Coating systems shall be factory applied. Field application will not be allowed.
 - (1) Field touch up allowed if damaged. Apply per manufacturer's instructions.

B. Ductile Iron Fittings:

1. All fittings shall be Tyler, Star, Sigma or approved equivalent and shall meet the requirements of AWWA C 153/111 or C 110/153 and shall be cement lined.
2. All fittings shall minimum pressure rating, 250 psi.
3. Flanged joint for all above grade fittings.
4. Mechanical joint for all buried fittings.
5. All buried fittings shall be polywrapped.
6. Coupling:
 - a. Approved Manufacturers:
 - (1) Romac 501
 - (2) EBAA Iron
 - (3) Or Approved Equal

- C. Sanitary Sewer Pipe Bedding:
1. Embedment material shall be placed to the top of the sewer main pipe with Class II – GW material as listed in ASTM D2321.
 2. Class II – GW material shall be a well graded gravel or gravel-sand mixture with little fines. Gradation shall meet the following:
- | <u>Size</u> | <u>Percentage Passing</u> |
|-------------|---------------------------|
| 1 ½" | 100% |
| No. 4 | <50% |
| No. 200 | <5% |
- D. Sanitary Sewer Steel Casing: Minimum casing thickness shall be 0.500 inches

PART 3 - EXECUTION

3.01 PHASING PLAN

- A. As much work and preassembly should be completed prior to beginning bypass pumping. Suggested pre bypass pumping work is as follows:
1. Expose existing piling/structure.
 2. Field verify pipe elevations.
 3. Construct as much of the pile/pier structure on both sides of the stream as possible:
 - a. Ideally all piles/piers would be constructed before commencement of bypass pumping if possible.
 4. Preassemble as much of the steel casing and pipeline as possible.
- B. Bypass pumping will be required to divert all flows to a manhole downstream of the project. Bypass pumping should be set up only once so as to allow for construction of the aerial crossing. The bypass pumping force main will run within the limits of construction shown in the plans.
- C. After bypass pumping is operational the following construction work should be performed:
1. Remove existing aerial crossing and any necessary supports:
 - a. Utilizing hydrant on north side of E 22nd St, Contractor required to flush 5 pipe volumes through existing line with potable water prior to demolition to prevent sewage entering Walnut Creek.
 2. Complete proposed pile/pier structure on both sides of stream if needed.
 3. Install preassembled casing and pipeline and attach to pile/pier structures.
 4. Confirm pipe slope.
 5. Connect upstream and downstream ends of pipe to existing pipe
 6. Perform post construction CCTV and mandrel testing:
 - (1) See 33 31 00 – Sanitary Sewer Piping.
- D. After all necessary testing is completed, gravity sewer shall be prepared to receive sewer flows. At this time, bypass pumping can be decommissioned and the following construction tasks completed:
1. Stop bypass pumping and teardown:

- a. Utilizing hydrant on north side of E 22nd St, Contractor required to flush 5 pipe volumes through bypass line with potable water prior to demolition to prevent sewage entering Walnut Creek.
2. Reconstruct stream banks.
3. Site cleanup/restoration.
4. Demobilization.
- E. The Contractor is encouraged to review the suggested sequence of work and modify as necessary to meet the intent of the Contract Documents and meet project deadlines established in the Contract. The Contractor shall submit a detailed construction schedule and phasing plan outlining the proposed sequence of work to be approved by the Owner and Engineer prior to construction.

3.02 BYPASS PUMPING

- A. Flow Information
 1. No flow monitoring data is available
 2. Based on the number of residences within the aerial crossing sewer shed and coupled with Metcalf and Eddy book values, an estimated average daily flow of 5,750 gallons per day (4 gpm) is conveyed by the subject pipe.
 3. Using an assumed peaking factor of 10, which is common for small sewer sheds, a peak hour flow of 40 gpm was estimated.
- B. Contractor to submit a bypass pumping plan for review and approval by Engineer prior to construction. Concept bypass pumping plan shown in the Plans is for Contractor benefit, but may be modified as necessary. Plan to include the following:
 1. Sewer plugging method and types of sewer plugs.
 2. Cofferdam type, materials, dimensions, and locations.
 3. Number, size, material, location and method of installation of suction piping or submersible pump(s).
 4. Number, size, material, location and method of installation of discharge/force main piping.
 5. Staging areas for pumps; bypass pump sizes, capacity, number of each size to be on site and power requirements.
 6. Product data for each type of pump.
 7. Calculations of static lift, friction losses, and flow velocity (pump curves showing pump operating range shall be submitted).
 8. Standby power generator or alternate power source size, location.
 9. Discharge piping plan and method of protecting discharge manholes or structures from erosion and damage.
 10. Thrust and restraint block sizes and locations on suction and discharge piping, including any temporary pipe supports and anchoring required.
 11. Method of noise control for each pump and/or generator.
 12. Schedule for installation of and maintenance of bypass pumping lines.
 13. Overall bypassing schedule.

- C. Hydrostatic Pressure Testing/Leakage Testing shall be required on the bypass pumping system prior to commencement of bypassing.
 - 1. Perform hydrostatic pressure/leakage testing of piping and appurtenances in accordance with AWWA C600 or C605.
 - 2. Notify Engineer at least 24 hours before testing.
 - 3. Provide results to Engineer for approval prior to commencement of bypassing.
- D. The Contractor shall have adequate standby equipment available and ready for immediate operation and use in the event of an emergency or breakdown. The Contractor shall include one stand-by pump of each size to be maintained on site.
- E. Bypass pumping system will be required to be operated 24 hours per day while necessary to construct the improvements.
 - 1. Sanitary sewer overflows will not be allowed.
 - 2. Contractor will not be permitted to stop or impede sewer flows under any circumstances.
 - 3. Contractor shall maintain sewer flow around the work area in a manner that will not cause surcharging of sewers, damage to sewers and that will protect public and private property from damage and flooding.
- F. Bypass pumping system shall have an alarm system installed to call for maintenance in the event of high-water levels, pump failure, or other mechanical issues.
- G. The Contractor shall take all necessary precautions to prevent flooding and/or backups to any private property. The Contractor is liable for any damages incurred should flooding and/or backups occur as a result of the Work.
- H. Contractor shall protect bypass pumping system pumps, piping, and other appurtenances from damage.
- I. Contractor shall protect existing sewer, manhole, and other existing infrastructure from damage inflicted by bypass pumping equipment and bypass pump operation.
 - 1. Any necessary repairs shall be at Contractor expense.
- J. When plugging or blocking is no longer needed for performance and acceptance of work, it is to be removed in a manner that permits the sewage flow to slowly return to normal without surge, to prevent surcharging or causing other major disturbances downstream.
- K. Bypass pumping shall not be removed until after the completion of post construction acceptance testing.
 - 1. CCTV and Mandrel testing per 33 31 00 – Sanitary Sewer Piping.

3.03 ACCESS REQUIREMENTS

- A. Notices: Contractor shall provide notice to property owners and authorities:
 - 1. Contractor shall notify owners of adjacent property and utilities when proceeding with the work that may affect them.
 - 2. When it is necessary to temporarily deny access by owners or tenants to their property, or when any utility service connection must be interrupted, Contractor shall give notices sufficiently in advance to enable the affected persons to provide for their needs. Notices shall conform to any applicable local ordinance and, whether delivered orally or in writing, will include information concerning the interruption and instructions on how to limit their inconvenience.

3. Utilities and other concerned agencies shall be contacted at least 48 hours prior to cutting or closing streets or other traffic areas or excavating near underground utilities or pole lines.
 4. Contractor shall regularly advise the local law enforcement, fire and rescue authorities of the project status and coordinate with them in a manner to maximize access to property in the construction area in event of an emergency.
- B. Contractor to maintain access for the residents of the area located within the area of the project, as much as possible. Contractor shall keep driveways and entrances serving adjacent properties clear and available to the property owner or occupant at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on site that obstructs access to property.
 - C. Contractor shall at all times maintain public access to the neighboring buildings in the project area.
 - D. Contractor shall provide temporary approaches and crossings of streets and sidewalks during construction operations. The temporary approaches and crossings shall be maintained by Contractor in good condition during construction operations.
 - E. Contractor to arrange site and premises to allow work by others and Owner.
 - F. Contractor to limit shutdowns of utility services to 4 hours at a time and arrange with Owner 48 hours in advance of any shutdowns.
 - G. Contractor shall take all precautions not to damage buildings, utilities, sidewalks, drives, trees and property that are to remain in place during and after construction activities. Contractor shall be responsible for any damage and repair at Contractor's expense.
 - H. Contractor shall provide their own fencing to maintain security of the site during construction as shown on the plans.

3.04 VERIFY UTILITY LOCATION

- A. Contractor to verify depth and location of existing utilities prior to any excavation.
- B. Contractor to verify that the existing utilities are of the size and type shown in the Drawings prior to providing any connecting materials.

3.05 UNFAVORABLE CONSTRUCTION CONDITIONS

- A. During unfavorable weather, wet ground or other unsuitable construction conditions, Contractor shall confine operations to work, which will not be affected adversely by such conditions. No portion of the work shall be constructed under conditions, which would adversely affect the quality or efficiency thereof, unless special means or precautions are taken by Contractor to perform the work in a proper and satisfactory manner.

3.06 TOPSOIL AND SUBSOIL

- A. Contractor shall remove the upper 6 inches (6") of topsoil from the area of trench excavation and store it on site. After the trench has been backfilled, Contractor shall replace the stored topsoil on top of the backfill to provide a suitable seed bed for the area above the trench excavation.
- B. Any excess topsoil remaining at the conclusion of the project shall be the responsibility of the contractor to remove from the site.

3.07 BARRICADES, LIGHTS AND TRAFFIC CONTROL

- A. General:
 - 1. All open trenches and other excavations shall have suitable barricades, signs, lights and other safe guards to provide adequate protection to the public. Obstructions such as material piles and equipment shall be provided with similar warning barricades, signs, lights and other safe guards.
 - 2. Contractor shall maintain traffic and shall provide and maintain traffic control devices in accordance with the contract documents.
 - 3. If there is no specific traffic control plan, then Contractor's traffic control devices shall be in accordance with and shall be placed as required in the current edition of the Manual on Uniform Traffic Control Devices for Streets & Highways.
 - 4. Barricades, signs, lights and other safeguards shall be placed and maintained by Contractor during construction activities.
 - 5. Contractor shall provide all necessary devices for traffic control during construction.
- B. Contractor shall conduct operations so that all streets along the proposed project are left open to at least one lane of traffic at all times.

3.08 REMOVALS

- A. Contractor shall use care in removing concrete, asphalt and other permanent surfacing. Additional removals required due to Contractor's negligence will be at Contractor's expense.
- B. Contractor shall saw-cut existing concrete, asphalt, etc. to be removed and this sawing shall be considered incidental and subsidiary to the other items of work for which direct payment is made. No separate payments will be made for this work.
- C. Where sewer and storm sewer castings are removed by Contractor, care shall be taken when removing castings so they are suitable for future reuse. The castings shall be salvaged to Owner and shall be delivered to a site designated by Owner.

3.09 DISPOSAL OF REMOVALS

- A. All disposal of any material that is removed shall be done in strict compliance with all applicable State, Federal and Local laws and rules and regulations.
- B. Excavated materials: Excess excavated material that is not suitable for reuse in the project shall be disposed of at Contractor's own disposal site and at Contractor's expense.
- C. Trees: All trees and stumps removed shall be disposed of by Contractor at Contractor's own disposal site and at Contractor's expense.
- D. Miscellaneous: Contractor shall be responsible for the disposal of any miscellaneous items at Contractor's own disposal site and at Contractor's expense.

3.10 CONSTRUCTION STAKING

- A. Refer to Section 00 73 00 - Supplementary Conditions, Paragraph SC-4.03.A.

3.11 TESTING

- A. Refer to Section 33 31 00 - Sanitary Sewer Piping for testing requirements.

3.12 WATER

- A. Contractor shall make arrangements to obtain water from Owner, as necessary for construction of the work.

- B. Contractor shall furnish all hose, hose adapters, backflow protection devices, meters and fittings necessary, and shall provide transportation and distribution of the water.
- C. Contractor shall exercise care in drawing water from the water system and shall not draw water at a rate (when combined with municipal uses) that will reduce the water system storage level below 75% of the maximum.
- D. If water is required to provide the proper moisture content for compaction, the transportation and distribution of water shall be considered incidental and subsidiary to other items of work for which direct payment is made.
- E. All work associated with this shall not be measured and paid for directly but shall be considered incidental and subsidiary to other items of work for which direct payment is made. No separate payments will be made for this work.

3.13 OPERATION OF WATER SYSTEM VALVE AND WATER MAIN CONNECTIONS

- A. No valve or other control on the existing water system shall be operated for any purpose by Contractor without prior permission of Owner.

3.14 CLEANUP

- A. Contractor shall return all areas disturbed by construction of the project to the original grade or to the finish grade as shown on Drawings and shall restore the site to as clean and sightly condition as before the work began.
- B. Contractor shall keep the cleanup of the project current with the construction and shall not have any more than 300 feet of construction at any time during the project which has not been cleaned up.
- C. During construction, areas to be maintained for traffic shall be kept clear of all hazardous materials, including but not limited to construction debris, dust, and mud.
- D. The cleaning and sweeping of the streets in the construction area shall be completed prior to the completion of the project. The project cleanup shall be conducted to the satisfaction of Owner and Engineer and shall be completed prior to final acceptance of the project.
- E. Contractor shall clean streets in project area whenever mud, dirt or debris is tracked onto to the streets as a result of the activities of Contractor, by his/her employees, sub-Contractors, suppliers or agents.

3.15 STARTUP AND TRAINING

- A. Diversion of sewer flows back to gravity sewer post construction shall be conducted only on Monday, Tuesday, Wednesday or Thursday.

END OF SECTION

SECTION 01 20 00
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 price 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 SCHEDULE OF VALUES

- A. Submit a printed schedule for projects or items bid as a lump sum.
- B. Revise schedule to list approved change orders with each application for payment.

1.03 APPLICATIONS FOR PROGRESS PAYMENTS

- A. Payment Period: Submit at intervals stipulated in the agreement or arranged at preconstruction meeting.
- B. Present required information in typewritten form.
- C. Form: Provided by Engineer.
- D. Execute Contractor's certification by signature of authorized officer.
- E. 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.
- F. List each authorized change order as a separate line item, listing change order number and dollar amount as for an original item of work.
- G. Submit 4 copies of each application for payment to Engineer for review.
- H. Include the following with the application:
 - 1. Transmittal letter as specified for submittals in Section 01 30 00 - Administrative Requirements.
 - 2. Construction progress schedule, revised and current as specified in Section 01 30 00 - Administrative Requirements.
 - 3. Affidavits and invoices attesting to on and off-site stored materials.
- I. When Engineer requires substantiating information, submit data justifying dollar amounts in question. Provide 1 copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.

1.04 MODIFICATION PROCEDURES

- A. Submit name of the individual authorized to receive change documents and who shall be responsible for informing others in Contractor's or subcontractor's employ of changes to the work.
- B. Engineer shall advise of minor changes in the work not involving an adjustment to contract price or contract time as authorized by the conditions of the contract by issuing supplemental instructions on letter.
- C. Work Directive Change: Engineer may issue a document, signed by Owner, instructing Contractor to proceed with a change in the work for subsequent inclusion in a change order.
 - 1. The document shall describe changes in the work and shall designate method of determining any change in contract price or contract time.
 - 2. Promptly execute the change in work.
- D. Notice of Change: Engineer may issue a document which includes a detailed description of a proposed change with supplementary or revised drawings and specifications and a change in contract time for executing the change. Contractor shall prepare and submit an estimated price quotation within 7 days.
- 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 price and contract time with full documentation.
- F. Computation of Change in Contract Amount:
 - 1. For change requested by Engineer for work falling under a fixed price contract, the amount shall be based on Contractor's price quotation.
 - 2. For change requested by Contractor, the amount shall be based on Contractor's request for a change order as approved by Engineer.
 - 3. For predetermined unit prices and quantities, the amount shall be based on the fixed unit prices.
- 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.
- H. Execution of Change Orders: Engineer shall 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 price.
- 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.

1.05 APPLICATION FOR FINAL PAYMENT

- A. Prepare application for final payment as specified for progress payments, identifying total adjusted contract price, previous payments and sum remaining due.
- B. Application for final payment shall not be considered until the following have been accomplished:
 - 1. All closeout procedures specified in Section 01 77 00 - Project Closeout.
 - 2. Walk through with Engineer and Owner.
 - 3. All punch list items completed.
 - 4. Acceptance signed. Full execution of the substantial completion, if not already executed.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 22 00

UNIT PRICES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Measurement and payment criteria applicable to work performed under a unit price payment method or lump sum.
- B. Defect assessment and nonpayment for rejected work.

1.02 COSTS INCLUDED

- A. Unit prices and lump sum prices included on the bid form shall include full compensation for all required labor, products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the work; and overhead and profit.
- B. Where a following technical specification attached to this contract document identifies a measurement and payment on a unit price basis or other method and no item is specifically listed on the bid form, such work shall be considered incidental to the contract. Full compensation shall be considered paid in listed bid items and no separate payment shall be made for incidental items of work including items not specifically identified as bid items.

1.03 UNIT QUANTITIES SPECIFIED

- A. Quantities indicated in the bid form are for bidding and contract purposes only. Quantities and measurements of actual work shall determine the payment amount.

1.04 MEASUREMENT OF QUANTITIES

- A. Measurement methods delineated in the individual specification sections complement the criteria of this section. In the event of conflict, the requirements of the individual specification section govern.
- B. Take all measurements and compute quantities. Measurements and quantities shall be verified by Engineer.
- C. Assist by providing necessary equipment, workers and survey personnel as required.
- D. Measurement Devices:
 - 1. Weigh Scales: Inspected, tested and certified by the applicable state weights and measures department within the past year.
 - 2. Platform Scales: Of sufficient size and capacity to accommodate the conveying vehicle.
 - 3. Metering Devices: Inspected, tested and certified by the applicable state department within the past year.
- E. Measurement by Weight: Concrete reinforcing steel, rolled or formed steel or other metal shapes shall be measured by handbook weights to the nearest pound. Welded assemblies shall be measured by handbook or scale weight.

01 22 00-1

- F. Measurement by Volume: Measured by cubic dimension using mean length, width and height or thickness to the nearest cubic yard.
- G. Measurement by Area: Measured by square dimension using mean length and width or radius measured to the nearest square foot or square yard. Horizontal stationing along the centerline of alignments is based upon level line measurement and is used for measurement and payment.
- H. Linear Measurement: Measured by linear dimension, at the item centerline or mean chord measured to the nearest foot. Horizontal stationing along the centerline of alignments is based upon level line measurement and is used for measurement and payment.
- I. Lump Sum: For each described item. Includes materials, equipment, labor, products and incidentals to provide for a complete and functional system as described in the specifications.
- J. Established Quantity (EQ): Plan quantity not field measured.

1.05 PAYMENT

- A. Payment for work governed by unit prices shall be made on the basis of the actual measurements and quantities of work which is incorporated in or made necessary by the work and accepted by Engineer, multiplied by the unit sum/price.
- B. Payment shall not be made for any of the following:
 - 1. Products wasted or disposed of in a manner that is not acceptable.
 - 2. Products determined as unacceptable before or after placement.
 - 3. Products not completely unloaded from the transporting vehicle.
 - 4. Products placed beyond the lines and levels of the required work.
 - 5. Products remaining on hand after completion of the work.
 - 6. Loading, hauling and disposing of rejected products.

1.06 DEFECT ASSESSMENT

- A. Replace work, or portions of the work, not conforming to specified requirements.
- B. If, in the opinion of Engineer, it is not practical to remove and replace the work, Engineer shall direct one of the following remedies:
 - 1. The defective work may remain, but the unit sum/price shall be adjusted to a new sum/price at the discretion of Engineer and accepted by Owner.
 - 2. The defective work shall be partially repaired as per the instructions of Engineer; and the unit sum/price shall be adjusted to a new sum/price at the discretion of Engineer and accepted by Owner.
- C. The individual specification sections may modify these options or may identify a specific formula or percentage sum/price reduction.
- D. The authority of Engineer to assess the defect and identify payment adjustment is final.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 30 00
ADMINISTRATIVE REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Preconstruction meeting.
- B. Progress meetings.
- C. Construction progress schedule.
- D. Submittal procedures.
- E. Submittal schedule.
- F. Shop drawings.
- G. Project data.
- H. Samples.
- I. Engineers Action.
- J. Manufacturer's instructions.

1.02 PROJECT COORDINATION

- A. Project Engineer: JEO Consulting Group, Inc.
- B. Cooperate with Owner and Engineer to determine the availability of staging areas for field offices, storage of materials, parking of equipment, etc.
- C. During construction, coordinate use of site and facilities through Owner and Engineer.
- D. Comply with Engineer's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings and recommendations; and resolution of ambiguities and conflicts.
- E. Comply with instructions of Owner and Engineer for use of temporary utilities and construction facilities.
- F. Coordinate field engineering and layout work under instructions of the project Engineer.
- G. Make the following types of submittals to Engineer:
 - 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. Coordination drawings.
10. Closeout submittals.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 PRECONSTRUCTION MEETING

- A. Engineer shall schedule a meeting after the contract documents are executed.
- B. Attendance Required:
 1. Owner.
 2. Engineer.
 3. Contractor.
 4. Subcontractors.
 5. Utilities.
- C. Agenda:
 1. Designation of project representatives for Owner, Engineer and Contractor.
 2. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, change orders and contract closeout procedures.
 3. Project scheduling.
 4. Scheduling activities of subcontractors.
 5. Review scope of project and project specific items.
 6. Review other miscellaneous items as needed.
- D. Record minutes and distribute copies after meeting to participants.

3.02 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of the work with a maximum of monthly intervals.
- B. Engineer shall make arrangements for meetings, prepare agenda with copies for participants and preside at meetings.
- C. Attendance Required: Job superintendent, major subcontractors and suppliers, Owner and Engineer, as appropriate to agenda topics for each meeting.
- D. Agenda:
 1. Review minutes of previous meetings.
 2. Review of work progress.
 3. Field observations, problems and decisions.
 4. Identification of problems which impede planned progress.

5. Review of submittals schedule and status of submittals.
 6. Review of off-site fabrication and delivery schedules.
 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.
- E. Engineer shall record minutes and distribute copies within 2 days after meeting to participants, with 1 copy each to Owner, Contractor, participants and those affected by decisions made.

3.03 CONSTRUCTION PROGRESS SCHEDULE

- A. Within 10 days after the effective 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 SUBMITTAL PROCEDURES

- A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.
 2. Coordinate transmittal of different types of submittals for related elements of the work so processing will not be delayed by the need to review submittals concurrently for coordination.
 - a. Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
 3. Processing: Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for resubmittals.

- a. Allow 2 weeks for initial review. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. Engineer shall promptly advise Contractor when a submittal being processed must be delayed for coordination.
 - b. If an intermediate submittal is necessary, process the same as the initial submittal.
 - c. Allow 2 weeks for reprocessing each submittal.
 - d. No extension of contract time shall be authorized because of failure to transmit submittals to Engineer sufficiently in advance of the work to permit processing.
- B. Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.
 - 1. Provide a space to record Contractor's review and approval markings and the action taken.
 - 2. Include the following information on the label for processing and recording action taken.
 - a. Project name.
 - b. Date.
 - c. Name and address of Engineer.
 - d. Name and address of Contractor.
 - e. Name and address of subcontractor.
 - f. Name and address of supplier.
 - g. Name of manufacturer.
 - h. Number and title of appropriate specification section.
 - i. Drawing number and detail references, as appropriate.
- C. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to Engineer using a transmittal form. Submittals received from sources other than Contractor shall be returned without action.
- D. Copies Required: If submitting hard copies, submit 6 copies for review unless otherwise noted in the Special Provisions. If submitted via electronic submittal, only 1 copy is required.

3.05 SUBMITTAL SCHEDULE

- A. After development and acceptance of Contractor's construction schedule, prepare a complete schedule of submittals. Submit the schedule within 10 days of the date required for establishment of Contractor's construction schedule.
 - 1. Coordinate submittal schedule with the list of subcontracts, schedule of values and the list of products, as well as Contractor's construction schedule.

2. Prepare the schedule in chronological order; include submittals required during the first 10 days of construction. Provide the following information:
 - a. Scheduled date for the first submittal.
 - b. Related section number.
 - c. Submittal category.
 - d. Name of subcontractor.
 - e. Description of the part of the work covered.
 - f. Scheduled date for resubmittal.
 - g. Scheduled date Engineer's final release or approval.
- B. Distribution: Following response to initial submittal, print and distribute copies to Engineer, Owner, subcontractors and other parties required to comply with submittal dates indicated. Post copies in the project meeting room and field office.
 1. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the work and are no longer involved in construction activities.
- C. Schedule Updating: Revise the schedule after each meeting or activity where revisions have been recognized or made. Issue the updated schedule concurrently with report of each meeting.

3.06 SHOP DRAWINGS

- A. Submit newly prepared information drawn to accurate scale. Highlight, circle or otherwise indicate deviations from the contract documents. Do not reproduce contract documents or copy standard information as the basis of shop drawings. Standard information prepared without specific reference to the project is not considered shop drawings.
- B. Shop drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. Include the following information:
 1. Dimensions.
 2. Identification of products and materials included.
 3. Compliance with specified standards.
 4. Notation of coordination requirements.
 5. Notation of dimensions established by field measurement.
 6. Sheet Size: Except for templates, patterns and similar full-size drawings, submit shop drawings on sheets formatted at least 8 1/2 inches x 11 inches but no larger than 24 inches x 36 inches. Electronic submittal is preferred.

7. If submitting hard copies, submit 6 Black Line Prints: For review unless otherwise noted in the Special Provisions.
 8. One of the prints returned shall be marked up and maintained as a "record document".
 9. Do not use shop drawings without an appropriate final stamp indicating action taken in connection with construction.
- C. Coordination drawings are a special type of shop drawings that show the relationship and integration of different construction elements that require careful coordination during fabrication or installation to fit in the space provided or function as intended.
1. Preparation of coordination drawings may include components previously shown in detail on shop drawings or product data.
 2. Submit coordination drawings for integration of different construction elements. Show sequences and relationships of separate components to avoid conflicts in use of space.

3.07 PRODUCT DATA

- A. Collect product data into a single submittal for each element of construction or system. Product data includes printed information such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams and performance curves. Where product data must be specially prepared because standard printed data is not suitable for use, submit as "shop drawings".
1. Mark each copy to show applicable choices and options. Where printed product data includes information on several products, some of which are not required, mark copies to indicate the applicable information. Include the following information:
 - a. Manufacturer's printed recommendations.
 - b. Compliance with recognized trade association standards.
 - c. Compliance with recognized testing agency standards.
 - d. Application of testing agency labels and seals.
 - e. Notation of dimensions verified by field measurement.
 - f. Notation of coordination requirements.
 2. Do not submit product data until compliance with requirements of the contract documents has been confirmed.
 3. Submittals: If submitting via hard copies submit 4 copies of each required submittal; submit 4 hard copies where required for maintenance manuals. Engineer shall retain one and shall return the other marked with action taken and corrections or modifications required.
 - a. Unless noncompliance with contract document provisions is observed, the submittal may serve as the final submittal.

4. Distribution: Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators and others required for performance of construction activities. Show distribution on transmittal forms.
 - a. Do not proceed with installation until an applicable copy of product data applicable is in the installer's possession.
 - b. Do not permit use of unmarked copies of product data in connection with construction.

3.08 SAMPLES

- A. Submit full-size, fully fabricated samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture and pattern.
 1. Mount, display, or package samples in the manner specified to facilitate review of qualities indicated. Prepare samples to match Engineer's sample. Include the following:
 - a. Generic description of the sample.
 - b. Sample source.
 - c. Product name or name of manufacturer.
 - d. Compliance with recognized standards.
 - e. Availability and delivery time.
 2. Submit samples for review of kind, color, pattern and texture, for a final check of these characteristics with other elements, and for a comparison of these characteristics between the final submittal and the actual component as delivered and installed.
 - a. Where variation in color, pattern, texture or other characteristics are inherent in the material or product represented, submit multiple units (not less than 3) that show approximate limits of the variations.
 - b. Refer to other specification sections for requirements for samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation and similar construction characteristics.
 3. Preliminary Submittals: Where samples are for selection of color, pattern, texture or similar characteristics from a range of standard choices, submit a full set of choices for the material or product.
 - a. Preliminary submittals shall be reviewed and returned with Engineer's mark indicating selection and other action.
 4. Submittals: Except for samples illustrating assembly details, workmanship, fabrication techniques, connections, operation and similar characteristics, submit 4 sets; 1 shall be returned marked with the action taken.

5. Maintain sets of samples, as returned, at the project site for quality comparisons throughout the course of construction.
 - a. Unless noncompliance with contract document provisions is observed, the submittal may serve as the final submittal.
 - b. Sample sets may be used to obtain final acceptance of the construction associated with each set.
- B. Distribution of Samples: Prepare and distribute additional sets to subcontractors, manufacturers, fabricators, suppliers, installers and others as required for performance of the work. Show distribution on transmittal forms.
 1. Field samples specified in individual sections are special types of samples. Field samples are full-size examples erected on-site to illustrate finishes, coatings or finish materials and to establish the standard by which the work will be judged.
 - a. Comply with submittal requirements to the fullest extent possible. Process transmittal forms to provide a record of activity.
- C. Compliance with specified characteristics is Contractor's responsibility.

3.09 ENGINEER'S ACTION

- A. Review required submittals with reasonable promptness and in accordance with schedule, only for general conformance to design concept of project and compliance with information given in plans and specifications. Review shall not extend to means, methods, sequences, techniques, procedures of construction, safety precautions or programs incidental thereof. Review of a separate item as such shall not indicate approval of assembly in which item functions.
- B. Affix stamp and initials or signature and indicate requirements for resubmittal or review of submittal. Engineer's action on submittal is classified as follows:
 1. No Exceptions Taken: Submittal has been reviewed and appears to be in conformance with design concept of project and plans and specifications.
 2. Make Corrections Noted: Submittal has been reviewed and appears to be in conformance with design concept of project and plans and specifications, except as noted by Engineer.
 3. Amend and Resubmit: Submittal has been reviewed and appears not to be in conformance with design concept of project and plans and specifications. Contractor shall make corrections as required by Engineer and resubmit for review.
 4. Rejected - See Remarks: Submittal has not been reviewed because submittal is otherwise substantially contrary to design concept of project and plans and specifications. Contractor shall revise submittal to correct defects and resubmit for review.
 5. No action taken.
- C. Return submittals to Contractor.

- D. Engineer's review of submittals shall not relieve Contractor from responsibility for any deviations from plans and specifications unless Contractor has, in writing, called Engineer's attention to such deviation at time of submission, and Engineer has given written concurrence pursuant to plans and specifications to specific deviations; nor shall any concurrence by Engineer relieve Contractor from responsibility for errors or omissions in submittals.
- E. Installation, manufacture or fabrication of items prior to final approval is at Contractor's own risk.

3.10 MANUFACTURER'S INSTRUCTIONS

- A. When required in individual specification section, submit manufacturer's printed instructions for delivery, storage, assembly, installation, start-up, adjusting and operation in quantities specified for product data.

END OF SECTION



Submittals Transmittal Form

TRANSMITTAL NO. | _____
DATE | _____
PROJECT | _____
JEO PROJECT NO. | _____
LOCATION | _____

CONTRACTOR | _____
ADDRESS | _____
CITY, STATE, ZIP | _____
PHONE | _____

☐ 1st Submittal ☐ Resubmittal [Previous Submittal No. _____, Date _____]

Contractor shall fill in columns 1 through 5 for each submittal item. List each drawing, data item, or sample separately.

1. Spec Section & Paragraph No.	2. Item Description	3. Manufacturer or Supplier	4. Drawing or Detail No. (if appropriate)	5. Sample Only (mark X)	6. Coordinating Professional Action (ref. A-E below)

These/this item(s) have been checked for compliance with specification requirements and space limitations and will meet these conditions.

Submitted by (CONTRACTOR):

Signature

Printed Name and Title

SPACE BELOW FOR JEO USE ONLY

Review is for general compliance with contract documents. No responsibility is assumed for correctness of dimensions or details.

The above data has been reviewed in accordance with the provisions of the project specifications and is returned with action designated above in accordance with the following legend (*circle one of the following*):

A B C D E
NO EXCEPTIONS TAKEN MAKE CORRECTIONS NOTED AMEND AND RESUBMIT REJECTED (SEE REMARKS) NO ACTION TAKEN (SEE REMARKS)

Remarks: _____

Reviewed by (COORDINATING PROFESSIONAL):

Signature

Date

SECTION 01 40 00
QUALITY REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Submittals - qualifications and reports.
- B. References and standards.
- C. Testing and inspection agencies.
- D. Control of installation.
- E. Tolerances.
- F. Testing and inspection.
- G. Manufacturers field service.
- H. Defect assessment.

1.02 SUBMITTALS - QUALIFICATIONS AND REPORTS

- A. Testing Agency Qualifications:
 - 1. Prior to start of work, submit testing agency name, address and telephone number, and names of full time registered Engineer and responsible officer.
 - 2. Submit copy of report of testing agency laboratory facilities inspection made by Materials Reference Laboratory of National Bureau of Standards during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
- B. Design Data: Submit for Engineer's knowledge as contract administrator or Owner for the limited purpose of assessing conformance with the design concept expressed in the contract documents.
- C. Test Reports: After each test/inspection, promptly submit 2 copies of report to Engineer.
 - 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 specification section.
 - f. Location in the project.
 - g. Type of test/inspection.
 - h. Date of test/inspection.
 - i. Results of test/inspection.

- j. Conformance with contract documents.
 - k. When requested by Engineer, provide interpretation of results.
- 2. Test reports are submitted for Engineer's knowledge as contract administrator for the limited purpose of assessing conformance with the design concept expressed in the contract documents and for Owner's information.
- D. 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 that material or product conforms to 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.
- E. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting and finishing for Owner's information. Indicate special procedures, perimeter conditions requiring special attention and special environmental criteria required for application or installation.
- F. Manufacturer's Field Reports: Submit reports for Engineer's benefit as contract administrator and for Owner's information.
 - 1. Submit report in duplicate within 15 days of observation to Engineer for information.
 - 2. Submit information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.
- G. Erection Drawings: Submit drawings for Engineer's benefit as contract administrator and for Owner's information.
 - 1. Submit for information and for the limited purpose of assessing conformance with the information given and the design concept expressed in the contract documents.
 - 2. Data indicating inappropriate or unacceptable work may be subject to action by Engineer or Owner.

1.03 REFERENCES AND STANDARDS

- A. For products and workmanship specified by reference to a document or documents not included in the project manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard of date of issue current on date of contract documents, except where a specific date is established by applicable code.
- C. Obtain copies of standards where required by product specification sections.

- D. Maintain copy at project site during submittals, planning and progress of the specific work until project acceptance.
- E. Should specified reference standards conflict with contract documents, request clarification from Engineer before proceeding.
- F. Neither the contractual relationships nor the duties or responsibilities of the parties in contract or those of Engineer shall be altered from the contract documents by mention inference or otherwise in any reference document.
- G. Should plans conflict with specifications or other contract documents, request clarification from Engineer before proceeding.

1.04 TESTING AND INSPECTION AGENCIES

- A. As indicated in the Section 01 10 00 - Special Provisions or individual specification sections, Owner or Contractor shall employ and pay for services of an independent testing agency to perform specified testing.
- B. Employment of an independent testing agency in no way relieves Contractor of obligation to perform work in accordance with requirements of contract documents.
- C. Owner Employed Agency:
 - 1. Owner shall employ a certified testing agency to test concrete for air content, slump and make cylinders for and perform compressive strength testing. Test frequency as indicated in Section 32 13 13 – Portland Cement Concrete or Section 03 30 00 – Cast in Place Concrete, as applicable.
 - 2. Owner shall employ a certified testing agency to test the asphalt for uniformity of the mix and conformity to the mix design. Owner shall employ a certified testing agency to collect and test asphalt core samples.
 - 3. Owner shall employ a certified testing agency for trench, fill and subgrade sampling and testing, and as noted in individual specification sections
 - 4. All costs (including testing and other evaluations) related to the determination of defective work shall be the responsibility of the Contractor, if said work is found to be defective.
 - 5. Retesting of failed tests and testing to identify a failed area shall be paid for by Contractor.

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 manufacturer's instructions, including each step in sequence.
- C. Should manufacturer's 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 and specified requirements indicate higher standards or more precise workmanship.
- E. Work shall be 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.
- H. The Contractor shall be responsible for the protection, care, and upkeep of the work, all associated storage sites, and other areas used to execute the contract.
 - 1. The Contractor shall take every precaution against injury or damage to the work due to the weather or from any other cause.
 - 2. The Contractor shall rebuild, repair, restore, and make good all injuries or damages to the work due to any cause before final acceptance at no additional cost.

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 manufacturer's tolerances. Should manufacturer's 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 required.
- B. Testing Agency Duties:
 - 1. Test samples of materials and 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 materials, products and mixes in accordance with specified standards.
 - 4. Ascertain compliance of materials, products and mixes with requirements of contract documents.
 - 5. Promptly notify Engineer and Contractor of observed irregularities or nonconformance of work or products.
 - 6. Perform additional tests and inspections required by Engineer.
 - 7. Attend preconstruction meetings and progress meetings.
 - 8. 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's Responsibilities:
1. Deliver to agency at designated location adequate samples of materials proposed to be used which require testing, along with proposed mix designs.
 2. Cooperate with testing agency 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 testing agency 48 hours prior to expected time for operations requiring testing/inspection services.
- E. Retesting required because of nonconformance to specified requirements shall be performed by the same agency on instructions by Engineer. Payment for retesting shall be paid for by the Contractor.

3.04 MANUFACTURER'S 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 of 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.
 2. Observer subject to approval of Owner.
- C. Report to Engineer observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturer's written instructions.

3.05 DEFECT ASSESSMENT

- A. Replace work or portions of the work not conforming to specified requirements.
- B. If, in the opinion of Engineer, it is not practical to remove and replace the work, Engineer shall direct an appropriate remedy or adjust payment.

END OF SECTION

SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Temporary utilities.
- B. Temporary sanitary facilities.
- C. Barriers.
- D. Fencing.
- E. Security.
- F. Vehicular access and parking.
- G. Waste removal facilities and services.
- H. Project identification.
- I. Removal of utilities, facilities and controls.

1.02 TEMPORARY UTILITIES

- A. Provide and pay for all electrical power, lighting, water, heating and cooling and ventilation required for construction purposes.
- B. Existing facilities may be used subject to the Owner's approval.
- C. New permanent facilities may not be used.

1.03 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
- B. Use of existing facilities is not permitted unless approved by Owner.
- C. New permanent facilities may not be used during construction operations.
- D. Maintain daily in clean and sanitary condition.
- E. At end of construction, return facilities to same or better condition as originally found.

1.04 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas to allow for Owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations.
- B. Provide barricades and covered walkways required by governing authorities for public rights-of-way.
- C. Provide protection for plants designated to remain. Replace damaged plants.
- D. Protect nonowned vehicular traffic, stored materials, site and structures from damage.

1.05 FENCING

- A. Construction: See Section 01 10 00 - Special Provisions.

01 50 00-1

1.06 SECURITY

- A. Provide security and facilities to protect work, existing facilities and Owner's operations from unauthorized entry, vandalism or theft.

1.07 VEHICULAR ACCESS AND PARKING

- A. Coordinate access and haul routes with governing authorities and Owner.
- B. Provide and maintain access to fire hydrants, free of obstructions.
- C. Provide means of removing mud from vehicle wheels before entering public right-of-way.
- D. Designated, existing on-site roads may be used for construction traffic.
- E. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.
- F. Existing parking areas may be used for construction parking subject to Owner's approval.
- G. Do not allow vehicle parking on existing pavement without Owner's approval.

1.08 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. Dispose of waste off-site periodically.
- C. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.09 PROJECT IDENTIFICATION

- A. Provide project identification sign of design and construction if indicated in the drawings or Section 01 10 00 - Special Provisions.
- B. Erect on site at location indicated.
- C. No other signs are allowed without Owner's permission, except those required by law.

1.10 REMOVAL OF UTILITIES, FACILITIES AND CONTROLS

- A. Remove temporary utilities, equipment, facilities and materials prior to recommendation of acceptance inspection.
- B. Remove underground installations to a minimum depth of 3 feet. Grade site as indicated.
- C. Clean and repair damage caused by installation or use of temporary work.
- D. Restore existing facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

01 50 00-2

SECTION 01 55 00
TRAFFIC CONTROL AND BARRICADING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. This section describes various materials, equipment and procedures involved in traffic control and barricading during construction.

1.02 REFERENCES

- A. Manual on Uniform Traffic Control Devices – MUTCD.
- B. National Cooperative Highway Research Program.
- C. Report 350 – NCHRP Report 350.
- D. ASTM D 4956 – Standard Specification for Retroreflective Sheeting for Traffic Control.
- E. State Standard Specifications, latest revision.

1.03 RESPONSIBILITIES

- A. Contractor and the contracting authority have certain responsibilities whether public traffic is allowed or is prohibited during construction.
- B. Contractor shall furnish, erect, operate, maintain, move and remove all traffic control and barricading devices required by the contract documents.
- C. All traffic control and barricading shall be in accordance with the current edition of the MUTCD (Manual on Uniform Traffic Control Devices) and latest revisions.

1.04 TRAFFIC CONTROL DEVICES

- A. All Category I traffic control and barricading devices used on projects shall meet National Cooperative Highway Research Program (NCHRP) Report 350. Category I devices are defined as low mass, single-piece traffic cones, tubular markers, single-piece drums and delineators. No lights or signs may be attached to these devices in order for them to meet the Category I limitations. Category I devices shall be self-certified by the vendor. It shall be the responsibility of the vendor of the device to determine if the device meets the evaluation criteria of NCHRP Report 350.
- B. All Category II traffic control devices purchased for use on projects shall meet NCHRP Report 350. Category II devices are defined as vertical panels, Type II and Type III barricades; moveable skid mounted sign stands and barrels with reflected signs or lights attached. Type III barricades with attached signs used on all projects shall meet NCHRP Report 350. A list of approved Category II traffic control devices is found on the world wide web at the following URL:

<http://safety.fhwa.dot.gov/fourthlevel/hardware/wzd.htm>.

1.05 MONITORING

- A. Contractor shall provide 24 hour per day continuous monitoring of traffic control and barricading devices.
- B. Assistance to motorists and involvement with obstructions shall continue until they are no longer an impediment to traffic and further assistance can be provided safely by others.
- C. When a vehicle or anything else is obstructing a travel lane or shoulder intended to be clear, the operator shall assist the motorist or remove the obstruction promptly and safely. If further assistance is needed, it is to be summoned.
- D. The operator shall keep a report of any events that restrict the normal traffic flow during complex operations.
- E. A copy of this report shall be provided to Engineer daily.
- F. Contractor shall perform the following quality control work associated with monitoring and documenting traffic control and barricading conditions daily as the project is constructed:
 - 1. Review all traffic control operations and maintain a project traffic control daily diary, which shall be submitted to Engineer and shall become a part of the contracting authority's project records. The diary shall include:
 - a. All reviews of traffic control devices and operations.
 - b. Approved changes to traffic control.
 - c. Incidentals affecting the efficiency and safety of traffic.
 - d. Coordinate all traffic control operations, including those of subcontractors and suppliers.

1.06 SIGNS

- A. Signs shall utilize retro reflective sheeting. Reflective sheeting shall meet the requirements of ASTM D 4956, including supplementary requirements, except when modified in the contract documents or this specification.
- B. Reflective sheeting shall be uniform in color and reflectivity. In a single sign or traffic control device, variations in color or reflectivity noticeable at a distance of 50 feet or more, under daytime or nighttime lighting conditions, shall be cause for rejection of the sign.
- C. Signs for traffic control and construction zones in duration for 4 calendar days or more shall be mounted on fixed posts.
- D. Signs for traffic control and construction zones in duration for less than 4 calendar days may be mounted on moveable skids or fixed posts.
- E. Fixed, post-mounted signs shall have the sign sheeting applied to rigid wood or metal and shall be mounted at a height of at least 7 feet, measured from the bottom of the sign to the near edge of the pavement. A secondary sign on the same post may be mounted 1 foot lower than specified above. Post-mounted signs shall have a clear distance 2 feet behind a curb or beyond the edge of the shoulder.

- F. Moveable skid mounted signs shall use flexible roll-up sheeting or other skid mounted sign systems that meet NCHRP 350 requirements. Moveable skid mounted signs shall be mounted at a height of at least 1 foot above the roadway.
- G. Mounting devices shall not be so substantial as to be a hazard to vehicles.
 - 1. Wood sign supports are allowed.
 - 2. U-shaped rail steel posts not exceeding 3.0 pounds per foot are allowed.
 - 3. Dual-post and triple-post configurations using these sign supports are acceptable provided that no more than 2 posts occupy any 8-foot wide path. Bracing of these posts shall not be permitted. Posts exceeding these requirements shall have breakaway features approved by Engineer.
- H. Signs shall be in a condition so they are effective for the intended purposes when viewed from a vehicle. For nighttime installations, the reflectance shall be adequate so that the message is clearly readable. Signs shall be maintained in a near vertical position.

1.07 CHANNELIZING DEVICES

- A. Channelizing devices shall utilize reflective sheeting.

1.08 BARRICADES

- A. Type II barricades shall be used for all pavement surfaces on interstate and multilane roadways, which include travel lanes, intersections, ramps, acceleration and deceleration lanes, crossovers and shoulders.
- B. At locations other than on interstate and multilane divided roadways, Type II barricades may be used. Type II barricades shall have a minimum length of rail of 2 feet.
- C. When Type II barricades are furnished as one of the options for channelizing devices in lieu of vertical panels, cones or drums, a 2 foot minimum length barricade may be used.
- D. Type III barricades shall be used where specifically required. They shall have a minimum length of rail of 4 feet. When used as a shoulder barricade, the minimum barricade is acceptable. Unless otherwise shown in the contract documents, other Type III barricades shall have a minimum effective length of rail of 8 feet, including locations where the barricades are staggered to permit construction or local traffic. Barricades of the minimum length may be used, side by side and rigidly fastened together by bolting or other approved methods, to make this effective length.
- E. When traffic is permitted in each direction around a Type III barricade, the Type III barricade used shall have fully reflectorized faces on both sides of the rails.
- F. Barricades shall be erected in essentially a horizontal position perpendicular to the direction of approaching traffic. When placed on the traveled way or shoulder, they shall be ballasted with sandbags placed so as not to cover any striped rail.

1.09 CONES, VERTICAL PANELS, DRUMS AND TUBULAR MARKERS

- A. Cones, vertical panels, drums and tubular markers shall meet the current requirements of the MUTCD, latest revision.

- B. When used to separate two-way traffic, temporary no passing lines shall be separated by approximately 16 inches with the marker to be installed between these lines.
- C. Tubular markers shall be between 28 inches and 34 inches in height with a diameter facing traffic at least 2 inches in width. Tubular markers shall be completely faced with reflectorized white and orange sheeting. The white reflectorized sheeting shall be in 2 bands 4 inches wide with 6 inches between bands. The top band shall be no more than 2 inches from the top of the tubular marker.

1.10 FLAGGERS

- A. Flaggers shall be trained about safe flagging operations that comply with Department of Roads or Transportation Flaggers Handbook, Part VI of the MUTCD and the standard specifications prior to flagging operations. Training of flaggers shall include the following:
 - 1. Issue and review the current Flaggers Handbook.
 - 2. Presentation of the current professional flagging video.
 - 3. Issue flagger training card, which shall include the following:
 - a. Employee name.
 - b. Date of training.
 - c. Name of instructor.
 - d. Expiration date of December 31 of the year following the training date.
 - e. Flaggers shall carry their flagger training card at all times and show it upon request.
 - 4. Contractor shall maintain a list of flaggers trained and the date of the training.
- B. Training shall not be required for short time, emergency or relief assignment of employees to flagging operations.
- C. Except in an emergency, flaggers shall use signs as specified in the current edition of the MUTCD, Part VI, except the signs shall be at least 24 inches wide. The sign shall be mounted on a staff with a clear distance of 6 feet above the road surface.
- D. To be visible to traffic while flagging, flaggers shall wear a soft cap or a hard hat and a vest, shirt or jacket. The colors of these articles of dress shall be orange or strong yellow-green or fluorescent versions of these colors. Combinations of these colors are acceptable.

1.11 LIMITATIONS

- A. All traffic control and barricading devices subject to movement by wind shall be anchored by sandbags.
- B. When a two-way road is open to public traffic during contract work, one-way traffic shall not be controlled through the work area by means of a carry through flag or other token, except during equipment failure or emergency. When voice or signal communication between flaggers at control points is difficult or not effective because of distance, sight or noise, other means shall be used. These may be two-way radios, pilot cars or traffic signals. When the normal work area exceeds 1/4 mile on projects, pilot

cars shall be used; however, where necessary for short durations, the distance may be extended to 1/2 mile for better sight distance or to clear intersections or other safety considerations with approval of Engineer, provided a two-way radio is used for communication between flaggers.

- C. During nonworking hours, traffic control and barricading devices intended for working hours only shall be removed, covered or turned down. When traffic control devices are no longer needed, they shall be removed.
- D. During daylight hours, workers exposed to traffic in or adjacent to traffic lanes should wear a vest, shirt or jacket equal to that required for flaggers.
- E. At night, workers shall wear clothing that is similar in color to that required for flaggers and is retro reflective to be highly visible to drivers. The retro reflective clothing shall be designed to identify clearly the wearer as a person and shall be visible through the full ranges of body actions.
- F. Engineer may require traffic control and barricading devices to be recleaned by washing. The device shall be washed with a brush and water and with detergent or solvent as necessary. Washing shall include a supplemental or auxiliary sign, if any, the entire target area or sign face, all reflectors, and faces of warning lights which are part of that device.
- G. Entry to and exit from work areas shall be in the direction of public traffic and shall not cross open traffic lanes at other than designated locations. During hours of darkness, Contractor shall operate equipment in the traffic control zone facing in the direction of traffic flow unless otherwise specified in the traffic control plan. Darkness shall include the period from sunset to sunrise and other times when conditions such as fog, snow, sleet or rain provide insufficient lighting to clearly identify persons and vehicles on the highway at a distance of 500 feet ahead.
- H. Unless otherwise stated in the traffic control plan, Contractor shall provide for a minimum of 2 miles between traffic control zones on rural roadways. Minimum distances between traffic control zones on urban roadways shall be at the direction of Engineer.

1.12 METHOD OF MEASUREMENT

- A. When the contract documents include a pay item for traffic control and barricading, Engineer shall measure for payment the following items:
 - 1. Traffic Control/Barricading: This item shall be the lump sum for traffic control and barricading for the project.

1.13 BASIS OF PAYMENT

- A. When the following item is required for traffic control and barricading, there shall be items included in the contract documents with payment as follows:
 - 1. Traffic Control/Barricading: When there is a contract item for traffic control, Contractor shall be paid either the lump sum contract price or at the contract unit prices. This payment shall be full compensation for erecting, maintaining, moving and removing all traffic control devices required by the contract

documents, including warning lights and for furnishing all materials, labor and equipment.

- B. If traffic control and barricading is not a bid item it shall be incidental to other items on the project.
- C. All traffic control and barricading devices furnished by Contractor shall remain Contractor's property at the completion of the work and shall be removed from the site when no longer needed.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 60 00
PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. General product requirements.
- B. Transportation, handling, storage and protection.
- C. Product option requirements.
- D. Substitution limitations and procedures.
- E. Spare parts and maintenance materials.

1.02 SUBMITTALS

- A. Proposed Products List: Submit list of major products proposed for use with name of manufacturer, trade name and model number of each product.
 - 1. Submit within 10 days of the effective date of the agreement.
 - 2. For products specified only by reference standards, list applicable reference standards.
- B. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options and other data. Supplement manufacturer's standard data to provide information specific to this project.
- C. Shop Drawing Submittals: Prepared specifically for this project; marked up drawings will not be acceptable.
- D. Sample Submittals: Illustrate functional and aesthetic characteristics of the product with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
 - 1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures and patterns.
- E. Indicate utility and electrical characteristics, utility connection requirements and location of utility outlets for service for functional equipment and appliances.

PART 2 - PRODUCTS

2.01 EXISTING PRODUCTS

- A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by the contract documents.
- B. Existing materials and equipment indicated to be removed, but not to be reused, relocated, reinstalled, delivered to Owner, or otherwise indicated as to remain the property of Owner, become the property of Contractor and shall be removed from project site.

2.02 NEW PRODUCTS

- A. Provide interchangeable components of the same manufacturer for components being replaced.

2.03 PRODUCT OPTIONS

- A. Products specified by reference standards or by description only. Use any product meeting those standards or description.
- B. Products specified by naming one or more manufacturers. Use a product of one of the manufacturers named and meeting specifications; no options or substitutions allowed.
- C. Products specified by naming one or more manufacturers with a provision for substitutions. Submit a request for substitution for any manufacturer not named.

2.04 SPARE PARTS AND MAINTENANCE PRODUCTS

- A. Provide spare parts, maintenance and extra products of types and in quantities specified in individual specification sections.
- B. Deliver to project site; obtain receipt prior to final payment.

PART 3 - EXECUTION

3.01 SUBSTITUTION PROCEDURES

- A. No substitutions will be considered prior to receipt of bids unless written request for approval has been received by Engineer at least 10 days prior to the date for receipt of bids. Substitution requests shall be submitted by the bidder or supplier.
- B. After an award of a contract, if Contractor chooses to make a substitution for items specified and that are available, Contractor shall identify an amount to be deducted from the bid price. Cost of substitution review shall be reimbursed to Owner and Engineer as per Article 7, Section 7.05.D, of the Standard General Conditions of the Construction Contract.
- C. Document each request with complete data substantiating compliance of proposed substitution with contract documents.
- D. A request for substitution 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.
 - 2. Will provide the same warranty for the substitution as for the specified product.
 - 3. Will coordinate installation and make changes to other work which may be required for the work to be complete with no additional cost to Owner.
 - 4. Waives claims for additional costs or time extension which may subsequently become apparent.
 - 5. Will reimburse Owner and Engineer for review or redesign services associated with reapproval by authorities/consultants.
- E. Substitutions will not be considered when they are indicated or implied on shop drawings or product data submittals without separate written request or when acceptance will require revision to the contract documents.

- F. Substitution Submittal Procedure:
1. Submit to Engineer 3 copies of Form 01 60 00 Material/Equipment Substitution Request Form Prior to Letting or Form 01 60 00-A Material/Equipment Substitution Request Form After Execution of Contract, whichever is applicable, for consideration. Limit each request to one proposed substitution.
 2. Submit shop drawings, product data and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.
 3. Engineer shall notify Contractor in writing of decision to accept or reject request.

3.02 CONTRACTOR SUBSTITUTIONS FOR APPROVED MAJOR EQUIPMENT

- A. Bidder shall indicate all proposed substitutions by listing in writing the substitute equipment or supplier and the addition or deduction to the base bid lump sum price for the proposed substitute item.
- B. Contractor may propose only one substitution for each item. No further substitutions will be considered.
- C. No proposed substitution for an item of approved major equipment shall be considered unless, in the opinion of Engineer or Owner, it conforms to the requirements of the contract drawings and specifications in all major respects, except for make, manufacturer or other minor details.
- D. Proposed Contractor substitutions shall be deemed as equal if the substitute is the same or better quality than the product or equipment specified under the base bid in terms of its function, performance, reliability, quality and general configuration.
- E. Required substitution data shall include:
1. Product Identification:
 - a. Manufacturer's name.
 - b. Telephone number and representative contact name.
 - c. Specification section or drawing reference number of originally specified product.
 2. Manufacturer's literature clearly marked to show compliance of proposed product with contract documents.
 3. Itemized comparison of original and proposed product addressing product characteristics including, but not limited to:
 - a. Size.
 - b. Composition or materials of construction.
 - c. Weight.
 - d. Electrical or mechanical requirements.
 4. Product Experience:
 - a. Location of past projects utilizing product.

- b. Name and telephone number of persons associated with referenced projects concerning proposed product.
 - c. Available field data and reports associated with proposed product.
- 5. Data relating to changes in construction schedule.
- 6. Data relating to changes in cost.
- 7. Samples:
 - a. At request of Engineer.
 - b. Full size if requested by Engineer.
 - c. Engineer not responsible for loss or damage to samples.
- 8. Data and drawing information shall be specifically prepared for this project. Sales catalog cuts or marked up drawings from previous projects are not acceptable.
- F. The design and preparation of these drawings and specifications are based on products and equipment specified under base bid. Bidder or Contractor shall be responsible for any and all changes necessary to accommodate the substitute items, including the costs for:
 - 1. Redesign.
 - 2. Revision of construction documents.
 - 3. Additional construction administration.

3.03 TRANSPORTATION AND HANDLING

- A. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
- B. Transport and handle products in accordance with manufacturer's instructions.
- C. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
- D. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct and products are undamaged.
- E. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement or damage.
- F. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.04 STORAGE AND PROTECTION

- A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.
- B. Store and protect products in accordance with manufacturer's instructions.
- C. Store with seals and labels intact and legible.

- D. Store sensitive products in weather tight, climate-controlled enclosures in an environment favorable to product.
- E. For exterior storage of fabricated products, place on sloped supports above ground.
- F. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.
- G. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- H. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- I. Prevent contact with material that may cause corrosion, discoloration or staining.
- J. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement or damage.
- K. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION

**ENGINEER USE ONLY**

Date Received _____

MATERIAL/EQUIPMENT SUBSTITUTION REQUEST FORM PRIOR TO LETTING

This form to be submitted with supporting data.

Project Description/Title _____ JEO Project No. _____

Date of Letting _____ Date of Submittal _____

Reference Specification and Section _____

Name of Bidder Submitting Substitution Request _____

Reason for Substitution Request _____

Is specified material or equipment available? ☐ Yes ☐ NoHas bidder procured plans and specifications from JEO Consulting Group, Inc.? ☐ Yes ☐ NoHas bidder reviewed instructions to bidders, general conditions and supplemental conditions regarding procedures for substitute or "or-equal" materials and equipment? ☐ Yes ☐ No

The contract, if awarded, will be on the basis of materials and equipment specified or described in the bidding documents, or those substitute or "or-equal" materials and equipment approved by Engineer and identified by addendum. The materials and equipment described in the bidding documents establish a standard of required type, function and quality to be met by any proposed substitute or "or-equal" item. No item of material or equipment shall be considered by Engineer as a substitute or "or-equal" unless written request for approval has been submitted by bidder and has been received by Engineer (submittal time and requirements as specified) prior to the date for receipt of bids. Each such request shall conform to requirements of the general conditions, supplemental conditions and instructions to bidders. 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 shall be final. If Engineer approves any proposed item, such approval shall be set forth in an addendum issued to all prospective bidders. Bidders shall not rely upon approvals made in any other manner.

APPROVED: ☐ Yes ☐ No

REVIEWER: _____

Signature

DATE: _____

**ENGINEER USE ONLY**

Date Received _____

MATERIAL/EQUIPMENT SUBSTITUTION REQUEST FORM AFTER EXECUTION OF CONTRACT

This form to be submitted with Contractor's supporting data.

Project Description/Title _____ JEO Project No. _____

Date of Letting _____ Date of Submittal _____

Reference Specification and Section _____

Contractor Submitting Substitution Request _____

Reason for Substitution Request _____

Is specified material or equipment available? ☐ Yes ☐ No

Has Contractor reviewed general conditions, supplemental conditions and other specified material/equipment submittal requirements regarding procedures for substitute or "equivalent" materials and equipment? ☐ Yes ☐ No

What cost savings will be experienced by Owner with this substitution? \$ _____

Contractor agrees to reimburse Owner for Engineer's review of substitution request if specified equipment is available? ☐ Yes ☐ No

Substitution requests will not be considered that are submitted by subcontractors or suppliers. The contract was awarded on the basis of materials and equipment specified or described in the contract documents, or those substitute or "or-equal" materials and equipment approved by Engineer and identified by addendum. The materials and equipment described in the contract documents establish a standard of required type, function and quality to be met by any proposed substitute or "or-equal" item. No item of material or equipment shall be considered by Engineer as a substitute or "or-equal" unless written request for approval has been submitted by Contractor and has been received by Engineer (submittal time and requirements as specified). Each such request shall conform to requirements of the general and supplemental conditions and any other material/equipment submittal requirements. The burden of proof of the merit of the proposed item is upon Contractor. Engineer's decision of approval or disapproval of a proposed item shall be final. If Engineer approves any proposed item, such approval shall be set forth in written notification to Contractor. Contractor shall not rely upon approvals made in any other manner.

APPROVED: ☐ Yes ☐ No

REVIEWER: _____

Signature

DATE: _____

SECTION 01 70 00
EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Examination, preparation and general installation procedures.
- B. Preinstallation meetings.
- C. Surveying for laying out the work.
- D. Cleaning and protection.
- E. Starting of systems and equipment.
- F. Demonstration and instruction of Owner's personnel.

1.02 PROJECT CONDITIONS

- A. Grade site to drain. Maintain excavations free of water. Provide, operate and maintain pumping equipment.
- B. Protect site from ponding or running water. Provide barriers as required to protect site from soil erosion.
- C. Ventilate enclosed areas to assist cure of materials, to dissipate humidity and to prevent accumulation of dust, fumes, vapors or gases.
- D. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent airborne dust from dispersing into atmosphere.
- E. Erosion and Sediment Control: Plan and execute construction by methods to control surface drainage from cuts and fills and from borrow and waste disposal areas. Prevent erosion and sedimentation.
 - 1. Minimize amount of bare soil exposed at one time.
 - 2. Provide temporary measures such as berms, dikes, bale checks, silt fence, etc. to prevent erosion.
 - 3. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
 - 4. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.
 - 5. Contractor is responsible to furnish and install any and all the measures necessary to control erosion, whether it is a pay item or not.
- F. Noise Control: Provide methods, means and facilities to minimize noise produced by construction operations.

- G. Pollution Control: Provide methods, means and facilities to prevent contamination of soil, water and atmosphere from discharge of noxious, toxic substances and pollutants produced by construction operations.
- H. Pest Control: Provide methods, means and facilities to prevent pest and insects from damaging work.
- I. Rodent Control: Provide methods, means and facilities to prevent rodents from accessing or invading premises.

1.04 COORDINATION

- A. Coordinate scheduling, submittals and work of the various sections of the project manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Notify affected utility companies about proposed construction and coordinate with their requirements.
- C. Verify utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to and placing in service such equipment.
- D. Coordinate space requirements, supports and installation of mechanical and electrical work which are indicated diagrammatically in the drawings. Follow routing shown for pipes, ducts and conduit as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance and for repairs.
- E. Coordinate completion and cleanup of work of separate sections.

PART 2 - PRODUCTS

2.01 NOT USED

PART 3 - EXECUTION

3.01 LAYING OUT THE WORK

- A. Verify locations of survey control points prior to starting work.
- B. Promptly notify Engineer of any discrepancies discovered.
- C. Control datum for survey may be indicated in the drawings.
- D. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
- E. Promptly report to Engineer the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
- F. Utilize recognized engineering survey practices.
- G. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
 - 1. Site improvements, including pavements; stakes for grading, fill and topsoil placement; and utility locations, slopes and invert elevations.

- 2. Grid or axis for structures.
- H. Periodically verify layouts by same means.
- I. Maintain a complete and accurate log of control and survey work as it progresses.

3.02 PROGRESS CLEANING

- A. Maintain areas free of waste materials, debris and rubbish. Maintain site in a clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces and other closed or remote spaces prior to enclosing the space.
- C. Broom and vacuum clean interior areas prior to start of surface finishing and continue cleaning to eliminate dust.
- D. Collect and remove waste materials, debris and rubbish from site periodically and dispose off-site.

3.03 PROTECTION OF INSTALLED WORK

- A. Protect installed work and provide special protection where specified in individual specification sections.
- B. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
- C. Prohibit traffic from landscaped areas.
- D. Limiting Exposure: Supervise construction activities to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging or otherwise deleterious exposure during the construction period, no matter what the cause. Where applicable, such exposures include, but are not limited to, the following:
 - 1. Excessive static or dynamic loading.
 - 2. Excessively high or low temperatures.
 - 3. Excessively high or low humidity.
 - 4. Water or ice.
 - 5. Heavy traffic.
 - 6. Soiling, staining and corrosion.
 - 7. Unusual wear or other misuse.
 - 8. Excessive weathering.
 - 9. Unprotected storage.
 - 10. Improper shipping or handling.
 - 11. Theft.
 - 12. Vandalism.

3.04 STARTING SYSTEMS

- A. Coordinate schedule for start-up of various equipment and systems.

- B. Notify Engineer and Owner 7 days prior to start-up of each item.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence and for conditions that may cause damage.
- D. Verify tests, meter readings and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Verify that wiring and support components for equipment are complete and tested.
- F. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturer's instructions.
- G. When specified in individual specification sections, require manufacturer to provide authorized representative to be present at site to inspect, check and approve equipment or system installation prior to start-up and to supervise placing equipment or system in operation.
- H. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.05 DEMONSTRATION AND INSTRUCTION

- A. Demonstrate operation and maintenance of products to Owner's personnel prior to date of final inspection.
- B. Demonstrate start-up, operation, control, adjustment, troubleshooting, servicing, maintenance and shutdown of each item of equipment.
- C. Provide a qualified manufacturer's representative who is knowledgeable about the project to perform demonstration and instruction of Owner's personnel.
- D. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.
- E. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

3.06 ADJUSTING

- A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.07 FINAL CLEANING

- A. Execute final cleaning after items have been completed but before making final application for payment.
 - 1. Clean areas to be occupied by Owner prior to final completion and/or before Owner's occupancy.
- B. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned, as recommended by the manufacturer of the equipment and/or fixtures.
- C. Clean filters, if reusable, or provide new for operating equipment.
- D. Clean site, sweep paved areas and rake clean landscaped surfaces.

- E. Remove waste and surplus materials, rubbish and construction facilities from the site.

3.08 MAINTENANCE SERVICE

- A. Furnish service and maintenance of components indicated in specification sections during the warranty period.
- B. Examine system components at a frequency consistent with reliable operation. Clean, adjust and lubricate as required.
- C. Include systematic examination, adjustment and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.
- D. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of Owner.

END OF SECTION

SECTION 01 71 13
MOBILIZATION AND DEMOBILIZATION

PART 1 - GENERAL

1.01 SCOPE

- A. The work shall consist of the mobilization and demobilization of Contractor's forces and equipment necessary for performing the work required under the contract.
- B. This work shall not include mobilization and demobilization for specific items of work for which payment is provided elsewhere in the contract.
- C. Mobilization shall not be considered as work in fulfilling the contract requirement for commencement of work.
- D. The work shall consist of providing all required contract bonding and insurance required under the contract.

1.02 UNIT PRICES - MEASUREMENT AND PAYMENT

- A. No measurement will be made.
- B. Mobilization: A lump sum amount that includes all items described in this section. The costs for insurance and bonds may be included in Mobilization if a separate bid item for insurance and bonds is not provided.
 - 1. The partial payment for any Mobilization item will be limited to an amount not to exceed 10 percent (10%) of the total amount bid, including mobilization, for the group in which the Mobilization occurs. In the event the lump sum bid for "Mobilization" exceeds 10 percent (10%) of the total group amount; the difference (remainder) will not be paid until Owner has accepted the Project.
 - 2. Subject to the limitations stated in Paragraph 1 of this subsection, when the contract documents provide a separate bid item for Mobilization, progress payments for mobilization shall be made as follows:
 - a. When 5 percent (5%) of the original contract sum for the contract or a specific Group has been earned, excluding Mobilization, the first 25 percent (25%) of the contract or that Group's Mobilization amount will be paid, subject to the limitations stated in Paragraph 1 of this subsection.
 - b. When 10 percent (10%) of the original contract sum for the contract or a specific Group has been earned, excluding Mobilization, the second 25 percent 25% (bringing the total payments to 50%) of the contract or that Group's Mobilization amount will be paid, subject to the limitations stated in Paragraph 1 of this subsection.
 - c. When 50 percent (50%) of the original contract sum for the contractor or a specific Group has been earned, excluding Mobilization, the second 50 percent 50% (bringing the total payments to 100%) of the contract or

that Group's Mobilization amount will be paid, subject to the limitations stated in Paragraph 1 of this subsection.

- d. Upon completion of all work on the project required by the contract, and acceptance by Owner, full payment will be made for mobilization, including any amount not paid as a progress payment.
- 3. When "Mobilization" is not shown as a separate pay item in the bid form, the work described in this section shall be considered incidental and subsidiary to all other items of work within the contract for which direct payment is made and no separate payments will be made for Mobilization.
- C. Insurance and Bonds: A lump sum amount that includes the costs of Contract Bond(s) and all insurance premiums.
 - 1. Payment for any Insurance and Bonds bid item will be allowed following contract execution and Owner will pay up to 100 percent (100%) of the bid item for that Group's Insurance and Bonds amount.
 - 2. When "Insurance and Bonds" is not shown as a separate pay item, it shall be included in the "Mobilization" bid item. If neither "Insurance and Bonds" or "Mobilization" are shown as separate bid items, the work described in this section shall be considered subsidiary to other pay items in the contract.

1.03 EQUIPMENT AND MATERIALS

- A. Mobilization shall include all activities and costs for transportation of personnel, equipment and operating supplies to the site; establishment of offices, buildings and other necessary facilities for Contractor's operations at the site; and premiums paid for performance and payment bonds, including coinsurance and reinsurance agreements as applicable.
- B. Demobilization shall include all activities and costs for transportation of personnel, equipment and supplies not included in the contract from the site, including the disassembly, removal and site cleanup of offices, buildings and other facilities assembled on the site for this contract. No separate payment will be made for demobilization.
- C. This work includes mobilization and demobilization required by the contract at the time of award. If additional mobilization and demobilization activities and costs are required during the performance of the contract as a result of changed, deleted or added items of work for which Contractor is entitled to an adjustment in contract price, compensation for such costs shall be included in the price adjustment for the item or items or work changed or added.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 77 00
PROJECT CLOSEOUT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of contract, including general and supplementary conditions and other specification sections, apply to this section.

1.02 SUMMARY

- A. This section specifies administrative and procedural requirements for project closeout including, but not limited to:
 - 1. Inspection procedures.
 - 2. Project record document submittal.
 - 3. Operation and maintenance manual submittal.
 - 4. Submittal of warranties.
 - 5. Final cleaning.
- B. Closeout requirements for specific construction activities are included in the appropriate sections.

1.03 PRIOR TO FINAL ACCEPTANCE

- A. Preliminary Procedures: Before requesting the substantial completion, complete the following.
 - 1. If 100 percent of project completion has not been achieved, include a list of incomplete items, the value of incomplete construction and reasons the work is not complete.
 - 2. Inform Owner of pending insurance changeover requirements.
 - 3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.
 - 4. Obtain and submit releases enabling Owner unrestricted use of the work and access to services and utilities; include occupancy permits, operating certificates and similar releases.
 - 5. Submit extra stock as specified in individual specification sections.
 - 6. The date of Substantial Completion in the final Certificate of Substantial Completion marks the commencement of the contractual correction period and applicable warranties required by the Contract.
- B. Inspection Procedures: On receipt of a request for inspection, Engineer shall either proceed with inspection or advise Contractor of unfilled requirements. Engineer shall advise Contractor of construction that must be completed or corrected before the substantial completion will be issued.

1. Engineer shall repeat inspection when requested and assured that the work has been completed.
2. Results of the completed inspection shall form the basis of requirements for final acceptance.

1.04 FINAL ACCEPTANCE

- A. Preliminary Procedures: Before requesting final inspection for substantial completion and final payment, complete the following. List exceptions in the request.
 1. Submit record drawings, maintenance manuals, property survey and similar final record information.
 2. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
 3. Submit an updated final statement, accounting for final additional changes to the contract sum.
 4. Submit a certified copy of Engineer's final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance and the list has been endorsed and dated by Engineer.
 5. Submit consent of surety with the application for final payment, if requested by the Owner.
 6. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 7. Submit an affidavit stating that, to the best of Contractor's knowledge, asbestos was not used in the manufacture and fabrication of products and materials used in conjunction with the project.
 8. Submit signed and completed punch list documents to Engineer.
- B. Reinspection Procedure: Engineer shall reinspect the work upon receipt of notice that the work, including inspection list items from earlier inspections, has been completed, except items where completion has been delayed because of circumstances acceptable to Engineer.
 1. Upon completion of reinspection, Engineer shall prepare the substantial completion, or advise Contractor of work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance of the project.

1.05 RECORD DOCUMENT SUBMITTALS

- A. General: Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; and provide access to record documents for Engineer's reference during normal working hours.
- B. Record Drawings: Maintain a clean, undamaged set of blue or black line white prints of contract drawings and shop drawings. Mark the set to show the actual installation where the installation varies substantially from the work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately; where

shop drawings are used, record a cross-reference at the corresponding location on the contract drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

1. Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of the work.
 2. Mark new information and/or design changes that were not shown on contract drawings or shop drawings.
 3. Note related change order numbers where applicable.
 4. Organize record drawing sheets into manageable sets; bind with durable paper cover sheets; and print suitable titles, dates and other identification on the cover of each set.
- C. Record Specifications: Maintain 1 complete copy of the project manual, including addenda, and 1 copy of other written construction documents, such as change orders and modifications issued in printed form during construction. Mark these documents to show substantial variations in actual work performed in comparison with the text of the specifications and modifications. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation. Note related record drawing information and product data.
1. Upon completion of the work, submit record specifications to Engineer for Owner's records.
- D. Record Product Data: Maintain 1 copy of each product data submittal. Mark these documents to show significant variations in actual work performed in comparison with information submitted. Include variations in products delivered to the site and from the manufacturer's installation instructions and recommendations. Give particular attention to concealed products and portions of the work which cannot otherwise be readily discerned later by direct observation. Note related change orders and markup of record drawings and specifications.
1. Upon completion of markup, submit complete set of record product data to Engineer for Owner's records.
- E. Extra Stock Submitted: Immediately prior to the date or dates of substantial completion, Contractor shall meet at the site with Engineer and Owner's personnel to transmit extra stock to Owner for storage purposes. Comply with delivery of Owner's storage area.
- F. Miscellaneous Record Submittals: Refer to other specification sections for requirements of miscellaneous record keeping and submittals in connection with actual performance of the work. Immediately prior to the date or dates of substantial completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to Engineer for Owner's records.

1.06 OPERATION AND MAINTENANCE MANUAL SUBMITTAL

- A. Maintenance Manuals: Organize operating and maintenance data into 3 sets of manageable size. Bind properly indexed data in individual heavy-duty, 3-inch, 3-ring

vinyl-covered binders complete with tab sections and table of contents, with pocket folders for folded sheet information. Mark appropriate identification on front and spine of each binder. Include the following types of information:

1. Emergency instructions.
2. Spare parts list.
3. Copies of warranties.
4. Wiring diagrams.
5. Recommend "turn around" cycles.
6. Inspection procedures.
7. Shop drawings and product data.
8. Equipment cards for all equipment furnished on project.
9. List of subcontractors and material suppliers.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 CLOSEOUT PROCEDURES

- A. Make submittals that are required by governing or other authorities.
 1. Provide copies to Engineer and Owner.
- B. Notify Engineer when work is considered ready for final/partial inspection.
- C. Submit written certification that contract documents have been reviewed, work has been inspected and that work is complete in accordance with contract documents and ready for Engineer's review.
- D. Owner shall occupy all of the site or facilities as indicated in the plans or as directed by Owner and Engineer.
- E. Correct items of work listed in executed punch list documents and comply with requirements for access to Owner occupied areas.
- F. Notify Engineer and Owner when work is considered 100 percent complete.
- G. Complete items of work determined by Engineer's final inspection.
- H. Operating and Maintenance Instructions: Arrange for each installer of equipment that requires regular maintenance to meet Owner's personnel to provide instruction in proper operation and maintenance. If installers are not experienced in procedures, provide instruction by manufacturer's representatives. Include a detailed review of the following items:
 1. Maintenance manuals.
 2. Record documents.
 3. Spare parts and materials.
 4. Tools.

5. Identification systems.
 6. Control sequences.
 7. Hazards.
 8. Cleaning.
 9. Warranties and bonds.
 10. Maintenance agreements and similar continuing commitments.
 11. Equipment cards.
 12. Lubricants and fuels.
- I. As part of instruction for operating equipment, demonstrate the following procedures:
1. Start-up.
 2. Shutdown.
 3. Emergency operations.
 4. Noise and vibration adjustments.
 5. Safety procedures.
 6. Economy and efficiency adjustments.
 7. Effective energy utilization.

3.02 FINAL CLEANING

- A. General: General cleaning during construction is required by the general conditions and included in Section 01 50 00 - Temporary Facilities.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal commercial building cleaning and maintenance program. Comply with manufacturer's instructions.
1. Complete the following cleaning operations before requesting inspection for substantial completion.
 - a. Remove labels that are not permanent labels.
 - b. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compound and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.
 - c. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean.
 - d. Clean the site, including landscape development areas, of rubbish, litter and other foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted to a smooth, even-textured surface.

- C. Removal of Protection: Remove temporary protection and facilities installed for protection of the work during construction.
- D. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.
 - 1. Wipe surfaces of mechanical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition.
 - 2. Wipe surfaces of electrical equipment. Clean light fixtures and lamps.
 - 3. Where extra materials of value remaining after completion of associated work have become Owner's property, arrange for disposition of these materials as directed by Engineer/Owner.

END OF SECTION

SECTION 02 41 13
DEMOLITION AND REMOVALS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Clearing of all tracts.
- B. Removal and disposal of all buildings, lighting, traffic signals, guardrail, structures, headwalls, culverts, bridges, abandoned pipelines or utilities, foundations, manholes, pipelines, and other obstructions not designated to remain.
- C. Removal of all sidewalks, pavement, driveways, trails, and other surfacing designated to be removed.
- D. Salvaging disposition designated material.
- E. Backfilling resulting cavities, when required.

1.02 REFERENCES

- A. State Standard Specifications, latest edition.

1.03 UNIT PRICES

- A. Remove Existing Structure:
 - 1. Includes removal of all structures, piping and appurtenances identified for removal, transport of salvage items to location designated by Owner, disposal of non-salvageable materials and debris from site, and backfilling resulting cavities.
 - 2. Method of Measurement and Pay Unit: By the unit (Each)
- B. Remove Pavement:
 - 1. Includes all pavement identified for removal in the plans regardless of type or thickness including sawing.
 - 2. Method of Measurement and Pay Unit: By the square yard.
- C. Remove Brick:
 - 1. Includes all brick pavers identified for removal in the plans, salvaging, stacking on pallets, providing pallets, transport of palletized salvaged brick to location designated by Owner, and disposal of non-salvageable brick and materials.
- D. Remove Sidewalk:
 - 1. Includes all walks identified for removal in the plans regardless of type or thickness including sawing.
 - 2. Method of Measurement and Pay Unit: By the square foot.
- E. Remove Fence:
 - 1. Includes all fence identified for removal.
 - 2. Method of Measurement and Pay Unit: By the lineal foot.
- F. Remove Drainage Structure:

1. Includes all inlets, junction boxes, manholes, headwall, etc.
 2. Method of Measurement and Pay Unit: By each structure removed (Each).
- G. Remove Drainage Piping:
1. Includes all types of storm sewer piping, culverts, and drain pipes.
 2. Method of Measurement and Pay Unit: By the lineal foot.

1.04 QUALITY ASSURANCE

- A. Perform work in accordance with State Standard Specifications.

1.05 REGULATORY REQUIREMENTS

- A. Conform to local, state and federal regulations for disposal of debris.
- B. Contractor to obtain, at Contractor's own expense, all permits or licenses for use and maintenance of dumps and waste sites.
- C. Coordinate removal and or relocation of work with utility owner.
- D. Conform to local, state and federal regulations for preparation and implementation of erosion control plan.

1.06 PROJECT CONDITIONS

- A. Protect above and below grade utilities that remain.
- B. Protect trees, plants and other features designated to remain as final landscaping.
- C. Existing structures to remain in place until new replacement structure is complete unless noted otherwise in the drawings.
- D. Non-salvageable materials become property of Contractor.
- E. Salvageable materials shall become the property of Contractor, except those items to be salvaged and delivered to Owner. See Section 01 10 00 – Special Provisions for a listing and disposition details.
- F. Protect benchmarks, survey control points and existing structures designated to be used in place from damage or displacement.

PART 2 - PRODUCTS

2.01 FILL MATERIAL

- A. See Section 31 23 23 – Fill and Backfill for material specifications.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Provide, erect and maintain temporary barriers and security devices.
- B. Protect existing landscaping materials, appurtenances and structures which are to remain.
- C. Prevent movement of adjacent structures. Provide bracing and shoring as necessary.
- D. Locate and mark location of utilities to remain.

- E. Identify waste area/salvage area for placing removed materials.

3.02 REMOVAL

- A. Excavate as necessary to perform removal, excavation cost incidental to the cost of the removal.
- B. Basement walls, foundations, floors and miscellaneous structures:
 - 1. Remove walls a minimum 2 feet below finish grade, or as indicated on the Plans.
 - 2. Break concrete floors into pieces approximately 4 square feet; leave in place.
 - 3. Backfill cavity with approved material.
- C. Bridges, Culverts and Other Drainage Structures:
 - 1. Remove abutments, piers, bents and walls entirely or to an elevation 2 feet below the subgrade, slope face or original ground level shown in the drawings or as directed by Engineer.
 - 2. Remove piers in streams to 2 feet below natural stream bottom.
 - 3. Dismantle, without damage, salvaged items; match and mark if appropriate for reassembly. Clean and transport to designated storage area.
 - 4. Cut truss member joints apart to render them unfit for reuse on a public road.
- D. Manholes, Catch Basins or Inlets to be Abandoned:
 - 1. Plug pipe connections with flowable fill.
 - 2. Backfill cavity with approved material.
- E. Pile Cutoff Elevation:
 - 1. Cut off or drive pile to the elevations shown in accordance with State Standard Specifications or a minimum of 2 feet below final grade or streambed.
 - 2. Backfill cavity with approved material.
- F. Remove paving, curbs, walks and driveways as indicated. Neatly saw cut edges at right angle to surface. Saw paving, curbs, walks and driveways full depth.
- G. Remove paving brick:
 - 1. All removed brick shall be salvaged, unless otherwise stated in Section 01 10 00 – Special Provisions. All whole salvaged brick shall be removed and place on pallets (provided by the Contractor). Loaded pallets shall be transported to the Owner's storage area.
 - 2. All broken or unusable brick shall be disposed of by the Contractor.
- H. Roadway lighting, sign lighting and traffic signals.
- I. Signs, Sign Support Structures and Foundations:
 - 1. Removal in accordance with State Standard Specifications.

3.03 REMOVING PORTION OF EXISTING STRUCTURE

- A. Cut, chip and trim connecting edges to line and grade shown in the drawings.

- B. Use care not to weaken or damage that portion of structure to be retained and used in place.
- C. Expose, clean, straighten and extend reinforcing steel into new work as shown in the drawings.

3.04 DISPOSAL

- A. Remove waste material from project site promptly as it is generated by construction operations; do not permit to accumulate. Unless directed, do not remove topsoil from the site.
- B. Remove brush, rubbish, spoil, excess excavated material and material not suitable for backfill to off-site location of Contractor's choice.
- C. Disposal areas shall be Contractor's responsibility and as legally permitted.
- D. Grade final cover to allow for positive surface drainage.
- E. Haul Routes:
 - 1. Determine haul roads with approval of agency having jurisdiction over proposed roadway.
 - 2. Make condition survey of haul roads prior to use and document with necessary photographs and written descriptions.
 - 3. Keep reasonably free from dirt, dust, mud and other debris from construction operations.
 - 4. Clean a minimum of twice a week.
 - 5. Repair any damaged haul roads to match existing conditions before use.
 - 6. No extra payment will be made for removals regardless of disposal locations.
 - 7. Temporary haul routes (roads) developed by the Contractor shall be completely removed at the completion of the project and the area returned to its original condition. The cost of temporary haul routes shall be incidental to the cost of the project.

3.05 SALVAGED MATERIALS

- A. Carefully remove, load, transport, unload and store materials and items designated as salvage.
- B. Reinstall salvage material and items as shown in the drawings.
- C. Reinstall street signage.
- D. Reinstall mailboxes at the height and location as per U.S. Postal Service requirements.

3.06 TESTING

- A. Owner to arrange and pay for density testing of backfill.
- B. Contractor pays for retesting.

END OF SECTION

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Concrete formwork
- B. Floors and slabs on grade
- C. Concrete foundation walls
- D. Elevated concrete slabs
- E. Concrete reinforcement
- F. Joint devices associated with concrete work
- G. Miscellaneous concrete elements, including equipment pads, light pole bases, thrust blocks and manholes
- H. Concrete curing

1.02 REFERENCES

- A. ACI 211.1 – Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete
- B. ACI 301 – Specifications for Structural Concrete for Buildings
- C. ACI 302.1R – Guide for Concrete Floor and Slab Construction
- D. ACI 304R – Guide for Measuring, Mixing, Transporting, and Placing Concrete
- E. ACI 305R – Hot Weather Concreting
- F. ACI 306R – Cold Weather Concreting
- G. ACI 309R – 05 Guide to Consolidation of Concrete
- H. ACI 315 – Standard Practice for Detailing Reinforced Concrete Structures
- I. ACI 351 – Grouting Between Foundations and Bases for Support of Equipment and Machinery
- J. ASTM C 33 – Standard Specification for Concrete Aggregates
- K. ASTM C 39 – Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
- L. ASTM C 94 – Standard Specification for Ready-Mixed Concrete
- M. ASTM C 143 – Standard Test Method for Slump of Hydraulic-Cement Concrete
- N. ASTM C 150 – Specification for Portland Cement

- O. ASTM C 171 – Standard Specification for Sheet Materials for Curing Concrete
- P. ASTM C 173 – Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method
- Q. ASTM A 185 – Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete (Withdrawn 2013)
- R. ASTM C 260 – Standard Specification for Air-Entraining Admixtures for Concrete
- S. ASTM C 309 – Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
- T. ASTM C 311 – Standard Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use in Portland - Cement Concrete
- U. ASTM C 494 – Standard Specification for Chemical Admixtures for Concrete
- V. ASTM A 497 – Standard Specification for Steel Welded Wire Reinforcement, Deformed, for Concrete (Withdrawn 2013)
- W. ASTM A 615 – Standard Specification for Deformed and Carbon-Steel Bars for Concrete Reinforcement
- X. ASTM C 618 — Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
- Y. ASTM C 920 – Standard Specification for Elastomeric Joint Sealants
- Z. ASTM C 1017 – Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete
- AA. ASTM C 1074 – Standard Practice for Estimating Concrete Strength by the Maturity Method
- BB. ASTM C 1077 – Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
- CC. ASTM C 1116 – Standard Specification for Fiber-Reinforced Concrete
- DD. ASTM D 2628 – Standard Specification for Preformed Polychloroprene Elastomeric Joint Seals for Concrete Pavements
- EE. ASTM D 5893 – Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements.
- FF. ASTM DD 6690 – Standard Specification for Joint and Crack Sealants, Hot-Applied for Concrete and Asphalt Pavements
- GG. ASTM E 329 – Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection
- HH. ASTM E 548 – Standard Guide for General Criteria Used for Evaluating Laboratory Competence
- II. ASTM E 1643 – Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs

- JJ. AASHTO M 33 – Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type)
- KK. AASHTO M 182 – Standard Specification for Burlap Cloth Made from Jute or Kenaf and Cotton Mats
- LL. State Standard Specifications for Highway Construction, Latest Addition, including all current supplemental specifications
- MM. NSF 61 – Drinking Water System Components - Health Effects

1.03 UNIT PRICES

- A. Concrete - Slab on Grade or Vertical in Forms or Miscellaneous Locations:
 - 1. Includes formwork, reinforcement, concrete, placement accessories, consolidating and leveling, troweling and curing.
 - 2. Method of measurement and pay unit by the cubic yard, square yard, as shown on the Bid Form, or as described in the Special Provisions Section 01 10 00.
 - 3. Components and accessories are subsidiary items to placing concrete.

1.04 SUBMITTALS

- A. Product Data: Submit manufacturer's data on manufactured material and products indicated.
- B. Design Mixes:
 - 1. Submit the proposed mix design for each class of concrete to Engineer and testing firm for review prior to commencement of concrete operations.
 - 2. Specify amounts of mix water to be withheld for later addition at project site, if any.
 - 3. Provide the source, type, name, and amount of each admixture in the design mix.
- C. Material Certificates: Signed by manufacturers certifying that each of the following items complies with requirements:
 - 1. Cementitious materials and aggregates.
 - 2. Steel reinforcement and reinforcement accessories.
 - 3. Admixtures.
- D. Mockup Panels:
 - 1. Contractor may be required to construct and erect a mockup panel for architectural surfaces, finishes, colors or other treatments.
- E. Shop Drawings - Steel Reinforcement: Details of fabrication, bending and placement prepared according to ACI 315.
 - 1. Included material, grade, bar schedules, stirrup spacing, bent bar diagrams, arrangement and supports of concrete reinforcement.

2. Include special reinforcement required for openings through concrete structures.
- F. Project Record Documents: Accurately record locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed concrete work similar in material, design and extent to that indicated for this project and whose work has resulted in construction with a record of successful in-service performance.
- B. Concrete Supplier's Qualifications: Firm experienced in manufacturing ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.
1. Concrete Supplier's must be certified according to the National Ready Mixed Concrete Association Certification of Ready Mixed Concrete Production Facilities.
- C. Testing Agency Qualifications: Independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 to conduct testing indicated, as documented according to ASTM E 548.
1. Personnel conducting tests shall be qualified as ACI concrete field testing technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
- D. Obtain each type or class of cementitious material of the same brand from the same source, aggregate from same source and each admixture from same source.

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. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true and smooth concrete surfaces. Furnish in largest practical sizes to minimize number of joints.
 - a. Plywood, metal or other approved panel materials.
 - b. Use of aluminum forms is prohibited.
 2. Rough-Formed Finished Concrete: Plywood, lumber, metal or other approved material. Provide dressed lumber on at least 2 edges and 1 side for tight fit. Use of aluminum forms is prohibited.
 3. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber reinforced plastic, paper or fiber tubes that will produce surfaces that meet specified formwork surface class. Use of aluminum forms is prohibited. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.

4. Chamfer Strips: Wood, metal, PVC or rubber strips 3/4 inch by 3/4 inch minimum.
5. Form Coating: Commercially formulated release agent that will not bond, stain or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
 - a. For steel forms, formulate form-release agent with rust inhibitor.
6. Form Ties: Cone snap type that will leave no metal within 1 1/2 inches of concrete surface. Form ties with a waterstop shall be used for any structure that its intended purpose is to hold a liquid (i.e., water, wastewater, swimming pools, etc.).

2.02 REINFORCEMENT

- A. Reinforcing Steel:
 1. ASTM A 615 Grade 60
 - a. New, deformed billet-steel bars.
 - b. Unfinished.
- B. Plain-Steel Welded Wire reinforcement:
 1. ASTM A 185, plain, fabricated from as-drawn steel wire into flat sheets.
 - a. Rolled sheets are not permitted.
- C. Deformed-Steel Welded Wire Reinforcement:
 1. ASTM A 497, flat sheet
 - a. Rolled sheets are not permitted.
- D. Dowel Bars:
 1. ASTM A 615 Grade 60.
 - a. New, smooth round steel bars.
 - b. Coated with organic coating AASHTO M 254, corrosion resistant coated dowel bars.
 2. Cut bars true to length with ends square and free of burrs.
- E. Reinforcement Accessories:
 1. Tie Wire: Annealed, minimum 16 gauge.
 2. Chairs, Bar Supports, Bolsters, Spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place shall comply with CRSI's "Manual of Standard Practice".
 3. Chairs, Bar Supports, Bolsters, Spacers, and other devices for spacing: Sized and shaped for adequate support of reinforcement during concrete placement.

2.03 CONCRETE MATERIALS

A. Concrete Materials:

1. Concrete shall consist of aggregate, Portland cement, water, approved air-entraining and other admixtures and pozzolans.

B. Cement:

1. Type I, Type II, Type I/II and Type III Portland cement shall conform to the requirements in ASTM C 150 with the following additional requirements:
 - a. Portland cement shall not contain more than 0.60 percent equivalent alkali.
 - b. Processing additions may be used in the manufacture of the cement, provided such materials have been shown to meet the requirements of ASTM C 465 and the total amount does not exceed 1 percent of the weight of Portland cement clinker.
2. Interground and Blended Cement shall conform to the requirements in ASTM C 595 with the following additional requirements:
 - a. Interground/Blended cement Type IP
 - (i) Type IP(25) shall be composed of Class F fly ash or Class N pozzolan replacement shall be 25%+/-2%
 - (ii) Type IP(20) shall be composed of Class F fly ash or Class N pozzolan replacement shall be 20%+/-2%
 - b. Interground/Blended cement Type IT
 - (i) For SCMs, slag cement and limestone, the maximum replacement by weight shall be 40%. The manufacturer has a production tolerance of +2% from the proposed replacement.
 - (ii) For slag cement, the maximum replacement shall be 20% or less when incorporated into the final Interground/Blended cement.
 - (iii) For limestone cement, the replacement range shall be from 5.1% to 10.0% when incorporated into the final Interground/Blended cement.

C. Normal weight Fine and Coarse Mix Aggregate:

1. Mineral aggregates shall be crushed rock, broken stone, gravel, sand-gravel, coarse sand, fine sand, or a mixture of these materials composed of clean, hard, durable, and uncoated particles.
2. Shall meet the requirements in ASTM C 33.
3. Aggregates shall be free from injurious quantities of dust, soft or flaky particles, loams, alkali, organic matter, paper, wood, or other deleterious matter as determined by Engineer.
4. Free of materials with deleterious reactivity to alkali in cement.

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- D. Fly Ash: Shall meet the requirements in Class F; ASTM C 618 and ASTM C 311.
 - 1. The use of Class C Fly ash is not acceptable in any concrete on this project.
- E. Water:
 - 1. Shall meet the requirements in ASTM C 94 and potable.
 - 2. Water shall be free from objectionable quantities of oil, acid, alkali, salt, organic matter, or other deleterious materials.

2.04 ADMIXTURES

- A. Contractor shall report the source, type, name, and amount of each admixture.
- B. Air-Entrainment Admixture:
 - 1. Shall meet the requirements in ASTM C 260.
 - 2. For concrete that requires shrinkage reducing admixture, ensure that the air entrainment admixture that meets the shrinkage reducing admixture's manufacturer's requirements is utilized.
- C. Plasticizing and Retarding Admixture: Shall meet the requirements in ASTM C 1017.
- D. Other Chemical Admixtures:
 - 1. Refer to approved products list in the applicable State or Local Standard Specifications or as specified in Section 01 10 00 - Special Provisions.
 - 2. Admixtures shall meet the requirements in ASTM C 494.
 - 3. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of concrete.
 - 4. Admixture shall not contain more than 1 percent of chlorides calculated as calcium chloride.

2.05 CONCRETE ACCESSORIES

- A. Vapor Retarder: 10 mil thick nonwoven, polyester-reinforced, polyethylene coated sheet, type recommended for below grade application.
- B. Waterstops:
 - 1. Corps of Engineers (COE) CRD-C 572 and ASTM Standards
 - 2. PVC type
 - 3. Factory fabricated corners, intersections and directional changes.
 - 4. Profile: Flat, ribbed with center bulb.
 - 5. Size: 4", unless specified differently on the Plans or Special Provisions.
 - 6. Pre-approved Manufacturers:
 - a. Greenstreak
 - b. Progress Unlimited, Inc.

- c. Westec Barrier Technologies
 - d. Williams Products, Inc.
 - e. Approved Equivalent
- C. Joint Filler: Preformed, non-extruding, bituminous type, AASHTO M 33.
- D. Joint Sealer:
 - 1. Asphaltic, hot poured, ASTM D 6690, Type II.
 - a. Application: Use for joints in vehicular traffic areas.
 - 2. Silicone, cold applied, ASTM D 5893.
 - a. Application: Use for joints in vehicular traffic areas.
 - 3. General Purpose Exterior Sealant: Polyurethane; ASTM C 920, Grade NS, Class 25, Uses T, I, M, A; single component. (Not for use in highway and airfield pavements and bridges.)
 - a. Applications: Use for:
 - (i) Control, expansion, and soft joints in masonry.
 - (ii) Joints between concrete and other materials.
 - (iii) Joints between metal frames and other materials.
 - (iv) Other exterior joints for which no other sealant is indicated.
 - 4. Exterior Preformed Expansion Joint Sealer: ASTM D 2628, hollow neoprene (polychloroprene) compression gasket, black in color, supplied in proper size and shape to perform for the finished joint detail on Drawings.
 - a. Applications: Use for:
 - (i) Exterior wall expansion joints.
 - (ii) Parking deck expansion joints.
 - 5. Concrete Paving Joint Sealant: Polyurethane, self-leveling; ASTM C 920, Class 25 100/50, Uses T, I, M and A; single component, color gray.
 - a. Applications: Use for:
 - (i) Joints in sidewalks, pedestrian walkways and vehicular paving (other than highway and airfield pavements and bridges) where a self-leveling sealant is appropriate.

2.06 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz/sq yd dry.

- C. Moisture-Retaining Cover: ASTM C 171; clear polyethylene or white burlap-polyethylene sheet.
- D. Water: Potable.
- E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.
- F. Liquid Membrane-Forming Compounds for Curing Concrete: White pigmented, AASHTO M 148, Type 2.

2.07 CONCRETE MIX DESIGN

- A. Specific mix design criteria for project components as stated in Section 01 10 00 – Special Provisions.
- B. For trial mixtures method, employ independent testing agency acceptable to Engineer for preparing and reporting proposed mix designs.
- C. Admixtures: Add acceptable admixtures as recommended in ACI 211 and at rates recommended by manufacturer.
 - 1. Use water-reducing admixture or high-range water-reducing admixture (superplasticizers) in concrete, as required, for placement and workability.
 - 2. Use water-reducing and retarding admixture when required by high temperatures, low humidity or other adverse placement conditions.
- D. Non-Shrink Grout:
 - 1. 6 sack grout, with the following quantities:
 - a. Cement: Type I, 2.87 cubic feet
 - b. Sand: Masonry sand, 17.97 cubic feet
 - c. 6% entrained air
 - d. Water: 4.54 cubic feet
 - e. POZZ 900 oz./100 admixture, 12 per mix
 - f. Water-Cementitious Ratio: 0.502 at SSD aggregate moisture
 - g. Unit Weight: 140.20 lbs./cf
- E. Maximum Water-Cementitious Materials Ratio: As specified by the applicable State or Local Standard Specifications or as specified in Section 01 10 00 - Special Provisions.
- F. Air Content: As specified by the applicable State or Local Standard Specifications or as specified in Section 01 10 00 - Special Provisions.

2.08 MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix and deliver concrete according to ASTM C 94 and ASTM C 1116 and furnish batch ticket information.

1. When air temperature is between 85- and 90-degrees F, reduce mixing and delivery time from 1 1/2 hours to 75 minutes. When air temperature is above 90 degrees F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify lines, levels and dimensions before proceeding with work of this section.
- B. Verify compacted subgrade is acceptable and ready to support footings, slabs and any other imposed loads.

3.02 PREPARATION

- A. Notify Engineer a minimum of 48 hours prior to commencement of concreting operations.
- B. Formwork: Comply with requirements of ACI 301. Design and fabricate forms to support all applied loads until concrete is cured.
 1. Set edge forms, bulkheads and intermediate screed strips for slabs to achieve required alignment, elevation and slope in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
 2. Chamfer exterior corners and edges of permanently exposed concrete.
 3. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt and other debris just before placing concrete.
 4. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
 5. Verify that forms are clean and free of rust before applying release agent. Coat contact surfaces of forms with form-releasing agent, according to manufacturer's directions, before placing reinforcement.
 6. Use of excavated earth back form shall not be permitted unless approved by Engineer. All structural walls shall be formed with form panels.
- C. Removing and Reusing Forms:
 1. Fabricate and assemble formwork to permit easy stripping and dismantling without damage to concrete. Forms shall be easily removed without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical. Kerf wood inserts for forming keyways, reglets, recesses and the like for easy removal.
 2. Formwork for sides of beams, walls, columns and similar parts of the work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 degrees F for 24 hours after placing concrete, provided concrete is hard enough to prevent damage by form removal operations,

concrete has adequate strength to maintain structural integrity of the work and curing and protection operations are maintained.

3. Leave formwork for beam soffits, joists, slabs and other structural elements that support weight of concrete in place until concrete has achieved at least 70 percent of 28-day design compressive strength.
4. Clean and repair surfaces of forms to be reused in the work. Split, frayed, delaminated or otherwise damaged form-facing material is not acceptable for exposed surfaces. Apply new form-release agent.
5. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms on exposed concrete surfaces unless approved by Engineer.

D. Embedded Items:

1. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions and directions furnished with items to be embedded.
 - a. Install anchor bolts, accurately located, to elevations required.

E. Coordinate placement of joint devices with erection of concrete formwork and placement of form accessories.

F. Vapor Retarder Under Interior Slabs on Grade:

1. Place, protect and repair vapor-retarder sheets according to ASTM E 1643 and manufacturer's instructions.

3.03 REINFORCEMENT

A. Delivery, Storage and Handling

1. Deliver, store and handle steel reinforcement to prevent bending and damage. Avoid damaging coatings on steel reinforcement.

B. Comply with requirements of ACI 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.

1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

C. Accurately position, support and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

D. Tying Reinforcement:

1. Tie reinforcing bars securely in place at all points where bars cross other reinforcing bars.

2. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- E. Install welded wire reinforcement in longest practical length on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least 1 mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Splice laps with tie wire.
- F. 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.
- G. Welding on reinforcing steel is prohibited unless specifically authorized by Engineer.

3.04 JOINT PLACEMENT

- A. Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired at locations indicated or as approved by Engineer.
 1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
 2. Form with preformed galvanized steel, plastic keyway-section forms or bulkhead forms with keys unless otherwise indicated. Embed keys at least 1 1/2 inches into concrete.
 3. Locate joints for beams, slabs, joists and girders in the middle third of span. Offset joints in girders a minimum distance of twice the beam width from beam-girder intersection.
 4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, girders and at top of footings or floor slabs.
 5. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners and in concealed locations where possible.
 6. Use bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Contraction Joints in Slabs-on-Grade. Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least 1/4 of concrete thickness as follows:
 1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate tool marks on concrete surfaces.
 2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete when cutting action will not tear, abrade or otherwise damage surface and before concrete develops random contraction cracks.

- D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams and other locations as indicated.
 - 1. Extend joint filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.
 - 2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface where joint sealants are indicated.
 - 3. Install joint-filler strips in lengths as long as practical. Where more than one length is required, lace or clip sections together.
- E. Dowel Joints: Install dowel sleeves and dowels or dowel bar and support assemblies at joints where indicated. Use dowel sleeves or lubricate or asphalt-coat 1/2 of dowel length to prevent concrete bonding to 1 side of joint.
- F. Waterstops:
 - 1. Flexible Waterstops: Install in construction joints as indicated to form a continuous diaphragm. Install in longest lengths practical. Support and protect exposed waterstops during progress of work. Field fabricate joints in waterstops according to manufacturer's instructions.

3.05 PLACING CONCRETE

- A. Follow recommendations of ACI 306R when concreting during cold weather.
- B. Follow recommendations of ACI 305R when concreting during hot weather.
- C. Before placing concrete, verify that installation of formwork, reinforcement and embedded items are complete and required inspections have been performed.
- D. Repair vapor retarder damaged during placement of concrete reinforcing. Repair with vapor retarder material; lap over damaged areas a minimum of 6 inches and seal watertight.
- E. Install joint devices in accordance with manufacturer's instructions.
- F. Ensure reinforcement, embedded parts and forms are not disturbed during concrete placement.
- G. Do not add water to concrete during delivery, at project site or during placement unless approved by Engineer.
- H. Deposit concrete continuously or in layers at such thickness that no concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete to avoid segregation. Concrete free fall distance shall not exceed 5 feet. This includes free fall in a discharge pipe. Chutes and tremie pipes may be used for conveying concrete to the forms when authorized by Engineer.
- I. Deposit concrete in forms in horizontal layers no deeper than 18 inches and in a manner to avoid inclined construction joints. Place each layer while preceding layer is still plastic to avoid cold joints.

1. Consolidate placed concrete with mechanical vibrating equipment. Use equipment and procedures for consolidating concrete recommended by ACI 309R.
 2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations no farther than the visible effectiveness of the vibrator. Place vibrators to rapidly penetrate placed layers and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration as necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mix constituents to segregate.
- J. Deposit and consolidate concrete for floors and slabs in continuous operation, within limits of construction joints, until placement of panel or section is complete.
1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 2. Maintain reinforcement in position on chairs during concrete placement.
 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
 4. Slope surfaces uniformly to drains where required.
 5. Begin initial floating using bull floats or darbies to form a uniform and open-texture surface plane, free of humps or hollows, before excess moisture or bleedwater appears on surface. Do not further disturb slab surfaces before starting finishing operations.
- K. Pumping Concrete:
1. Pump concrete into forms in a continuous stream and free of air pockets. Eject concrete in the pipeline in such a manner that there will be no contamination or segregation of the concrete.
 2. Use pump discharge pipes designed to maintain a positive pressure head on the concrete. Free fall distance shall not exceed 5 feet at discharge.
 3. Perform air test, slump tests and fabrication of concrete test cylinders at the final discharge point.
- L. Cold-Weather Placement: Comply with ACI 306.1 and as follows:
1. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions or low temperatures.
 2. When air temperature has fallen to or is expected to fall below 40 degrees F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 degrees F and not more than 80 degrees F at point of placement.
 3. Do not use frozen materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

4. Do not use calcium chloride, salt or materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mix designs.
- M. Hot-Weather Placement: Comply with ACI 305R and as follows when hot weather conditions exist:
1. Cool ingredients before mixing to maintain concrete temperature below 90 degrees F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
 3. Fog-spray forms, steel reinforcement and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots or dry areas.
- N. Screed floors level, maintaining surface flatness of maximum 1/4 inch in 10 feet.

3.06 CONCRETE FINISHING

- A. Repair surface defects, including tie holes, immediately after removing formwork.
- B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.
- C. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height. Provide finish as follows:
1. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive not more than 24 hours after form removal.
 2. Grout Cleaned Finish: Wet areas to be cleaned and apply grout mixture by brush or spray; scrub immediately to remove excess grout. After drying, rub vigorously with clean burlap and keep moist for 36 hours.
 3. Cork Floated Finish: Immediately after form removal, apply grout with trowel or firm rubber float, compress grout with low-speed grinder and apply final texture with cork float.
- D. Concrete Floors and Slabs: Finish to requirements of ACI 302.1R and as follows:
1. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats. Straighten, cut down high spots and fill low spots. Repeat float passes and straightening until surface is left with a uniform, smooth, granular texture.
 - a. Apply float finish to surfaces indicated, to surfaces to receive trowel finish, and to floor and slab surfaces to be covered with fluid-applied or sheet waterproofing, built-up membrane roofing or sand-bed terrazzo.

2. Trowel Finish: After applying float finish, apply first trowel finish and consolidate concrete by hand or power-driven trowel. Continue troweling passes and straighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
 - a. Apply a trowel finish to surfaces indicated and to floor and slab surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic, or quarry tile set over a cleavage membrane, paint or another thin-film finish coating system.
 - b. Finish and measure surface so gap at any point between concrete surface and an unlevleed freestanding 10-foot long straightedge, resting on 2 high spots and placed anywhere on the surface, does not exceed 1/4 inch.
3. Trowel and Fine-Broom Finish: Apply a partial trowel finish, stopping after second troweling, to surfaces indicated and to surfaces where ceramic or quarry tile is to be installed by either thick-set or thin-set method.
 - a. Immediately after second troweling, and when concrete is still plastic, slightly scarify surface with fine broom.
4. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps and elsewhere as indicated.
 - a. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Engineer before application.
5. Burlap Drag Finish: Apply a burlap drag finish to paving, parking areas and elsewhere as indicated.
 - a. Immediately after float finishing, texture by dragging a wet burlap, carpet or canvas belt over full width of surface in longitudinal direction.
 - b. Suspend drag from mandrel or similar device to ensure uniform texture.
 - c. Rinse or wash drags as necessary to obtain uniform texture.
 - d. Replace drags which cannot be cleaned.

3.07 CURING AND PROTECTION

- A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold weather protection and with recommendation in ACI 305R for hot weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry or windy conditions cause moisture loss approaching 0.2 lb/sq ft per hour before and during finishing operations.
 1. If the rate of evaporation approaches 0.2 lb/sq ft per hour, Contractor must notify Engineer regarding the additional actions that will be taken to prevent plastic shrinkage cracking.

2. Obtain rate of evaporation from applicable State or local Standard Specification.
- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing by one or a combination of methods:
1. Moisture Curing: Keep surfaces continuously moist for not less than 7 days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
 2. Moisture-Retaining Cover Curing: Cover concrete surfaces and sides with moisture-retaining cover for curing concrete, placed in widest practical width, lapped at least 12 inches and sealed with waterproof tape or adhesive. Cure for not less than 7 days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 - a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
 - b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
 - c. Cure concrete surfaces to receive floor covering with either a moisture-retaining cover or a manufacturer recommended curing compound for use with floor coverings.
 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.
 4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Repeat process 24 hours later and apply second coat. Maintain continuity of coating and repair damage during curing period.
- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings and other surfaces, by one of the methods listed above in formed surfaces.

3.08 JOINT FILLING

- A. Prepare, clean and install joint filler according to manufacturer's directions.
- B. Remove dirt, debris, saw cuttings, curing compounds and sealers from joints; leave contact faces of joint clean and dry.

- C. Install semi-rigid epoxy joint filler depth in saw-cut joints and at least 2 inches into deep-formed joints. Overfill joint and trim joint filler flush with lip of joint after hardening.
- D. Seal joints in conformance with Drawings and according to manufacturer's directions for joint sealer product used.
- E. For preformed compression seals install compressed into the joint, with manufacturer-approved equipment and installation method.
- F. If adhesion is not satisfactory, the joint sealer material will be removed and the joint cleaned and resealed at no cost to Owner.

3.09 FIELD QUALITY CONTROL

- A. An independent testing agency employed by Owner shall perform field quality control tests as specified in Section 01 40 00 - Quality Requirements.
 - 1. Contractor shall provide free access to concrete operations at project site and cooperate with testing agency.
 - 2. Contractor shall submit proposed mix design of each class of concrete to Engineer and testing agency for review prior to commencement of concrete operations.
 - 3. Results of testing shall be furnished in a timely manner to Owner, Engineer and Contractor, in writing.
 - 4. Field testing and laboratory testing of concrete will be performed by testing agency employed by Owner to determine conformance with specified requirements.
 - 5. Strength Testing:
 - a. Compressive Strength Test Samples: ASTM C 39. For each test, mold and cure 3 concrete test cylinders. A set of 3 test cylinders shall be collected for every 100 cubic yard or fractional part thereof for each class of concrete placed in a day. At least one set of cylinders is required for each day concrete placement takes place.
 - (i) One additional cylinder may be required for a break prior to 7 days.
 - (ii) Take 1 additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.
 - b. Maturity Method for Estimating Strength: ASTM C 1074. The Contractor may elect to utilize the maturity curve method to determine concrete strength. The Contractor must notify the Engineer in writing and submit a Plan with any changes applicable with State or local standard specifications.
 - 6. Perform 1 slump test for each set of test cylinders taken.

- a. If the concrete mixture is excessively wet causing segregation, excessive bleeding, or any other undesirable condition, the concrete shall be rejected.
 - b. If the slump is outside the allowable limits specified in Section 01 10 00 - Special Provisions, the load of concrete shall be rejected.
- 7. Perform 1 air content test for each set of test cylinders taken.
 - a. If the air content is less than the minimum specified, only one addition of air-entraining admixtures is allowed.
 - b. If the air content is then outside the allowable limits specified in Section 01 10 00 - Special Provisions, the load of concrete shall be rejected.
- B. The independent testing agency employed by Owner will maintain records of placed concrete items and Contractor shall assist testing agency as necessary to accomplish the completion of this record keeping. Records will include type of test samples taken, all test results, date and location of sample collected, concrete test cylinder number, quantity of concrete placed and slump, air content, air temperature test results.
- C. Additional Tests: The testing agency employed by Owner shall make additional tests of concrete, as directed by Engineer, when test results indicate that slump, air entrainment, compressive strengths or other requirements have not been met.
 - 1. The cost for this additional testing will be paid for by Contractor.
 - 2. If any additional testing is required to isolate failures, this shall be considered retests and shall be paid for by Contractor.

3.10 DEFECTIVE CONCRETE

- A. All materials which Engineer determines to be damaged, defective, or otherwise unsuitable for use will be rejected and shall be removed and replaced at Contractor's expense.
- B. Contractor will be required to take corrective measures for high spots or low areas by removal and replacement, or by grinding with a machine equipped with multiple diamond blades with spacers to the required profile. If grinding is used, utilize methods which do not break the cement and aggregate bond. Engineer will determine whether defective concrete will be repaired, or if it will be rejected and removed and replaced. Contractor shall submit the proposed corrective action plan and receive Engineer AND Owner approval prior to performing corrective measures. The approved corrective measure will be done at Contractor's expense.
- C. Contractor will be required to take corrective measures for any cracking of concrete no matter what the cause. The corrective measures may include routing and sealing the cracks or removal and replacement. Engineer will determine whether defective concrete will be repaired, or if it will be rejected and removed and replaced. Contractor shall submit the proposed corrective action plan and receive Engineer AND Owner approval prior to performing corrective measures. The approved corrective measures will be done at Contractor's expense.

- D. Joints: Contractor will be required to take corrective measures for any joints that in the opinion of Engineer are not constructed per the plans and specifications. Contractor shall submit the proposed corrective action plan and receive Engineer AND Owner approval prior to performing corrective measures. The approved corrective measures will be done at Contractor's expense.
- E. Contractor will be required to take corrective measures for any concrete containing excessive honeycombing, spalling, fractures, chips and concrete that does not conform to required lines, details, dimensions, tolerances, specified requirements or other defects at no additional cost to Owner. The corrective measures may include repairing concrete or removal and replacement of concrete. Engineer will determine whether defective concrete will be repaired, or if it will be rejected and removed and replaced. Contractor shall submit the proposed corrective action plan and receive Engineer AND Owner approval prior to performing corrective measures. The approved corrective measures will be done at Contractor's expense.
- F. Contractor must protect the concrete from damage due to rain, premature drying, excessive hot or cold temperatures, foot traffic and vehicular traffic. Failure to properly protect concrete may constitute cause for repairing or for removal and replacement of defective concrete. Engineer will determine whether defective concrete shall be repaired, or if it shall be rejected and removed and replaced. Contractor shall submit the proposed corrective action plan to address the defective concrete and receive Engineer AND Owner approval prior to performing corrective measures. The approved corrective measures will be done at Contractor's expense.
- G. The cost of any additional testing performed as a result of repairing or removal and replacement of defective concrete shall be borne by Contractor when defective concrete is identified.

3.11 TOLERANCES

- A. Maximum Variation of Surface Flatness: 1/8 inch in 10 feet.
- B. Maximum Variation from True Position: 1/4 inch.
- C. All concrete shall meet or exceed the strength requirement of the specifications.
 - 1. If concrete does not meet the minimum strength requirement, the Contractor may elect to further evaluate the use of the concrete in place. Evaluation shall be performed by the Engineer of record, at the Contractor's expense. .
 - 2. Concrete not approved by the Engineer shall be rejected and shall be removed and replaced at Contractor's expense.
- D. All concrete shall meet or exceed the minimum thickness as per the plans and specifications.
 - 1. If concrete does not meet the minimum thickness requirement, the Contractor may elect to further evaluate the use of the concrete in place. Evaluation shall be performed by the Engineer of record, at the Contractor's expense.
 - 2. Concrete not approved by the Engineer shall be rejected and shall be removed and replaced at Contractor's expense.

END OF SECTION

SECTION 05 12 33
STRUCTURAL STEEL

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Structural steel girders, separators, splices, and stiffeners for superstructure.
- B. Shear stud connectors and Steel for substructure including channels, angles, plates and tie rods.

1.02 UNIT PRICES

- A. Steel Superstructure:
 - 1. Basis of Measurement: By the Lump Sum.
 - 2. Basis of Payment: Includes structural members fabricated, placed and anchored.
- B. Substructural Steel:
 - 1. Basis of Measurement: By the pound.
 - 2. Basis of Payment: Includes all members fabricate, placed and anchored.

1.03 REFERENCES

- A. AISC M016 – ASD Manual of Steel Construction; American Institute of Steel Construction, Inc.; 1989, Ninth Edition.
- B. AISC S303 – Code of Standard Practice for Steel Buildings and Bridges; American Institute of Steel Construction, Inc.; 2000.
- C. AISC S329 – Allowable Stress Design Specification for Structural Joints Using ASTM A325 or A490 Bolts; American Institute of Steel Construction, Inc.; 1985, Reaffirmed 1994.
- D. ASTM A 36 – Standard Specification for Carbon Structural Steel; 2001.
- E. ASTM A 242 – Standard Specification for High-Strength Low-Alloy Structural Steel; 2001.
- F. ASTM A 307 – Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength; 2000.
- G. ASTM A 325 – Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength; 2002.
- H. ASTM A 490 – Standard Specification for Structural Bolts, Alloy Steel, Heat-Treated, 150 ksi Minimum Tensile Strength; 2002.
- I. ASTM A 588 – Standard Specification for High-Strength Low-Alloy Structural Steel with 50 ksi (345 MPa) Minimum Yield Point to 4-in. (100-mm) Thick; 2001.
- J. AWS A2.4 – Standard Symbols for Welding, Brazing, and Nondestructive Examination; American Welding Society; 1998.
- K. AWS D1.1 – Structural Welding Code - Steel; American Welding Society; 2002.
- L. ITS (DIR) – Directory of Listed Products; Intertek Testing Services NA, Inc.; current edition.
- M. SSPC-Paint 20 – Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 1982 (Ed. 2000).

- N. State Standard Specifications.

1.04 SUBMITTALS

- A. Shop Drawings:
 - 1. Indicate profiles, sizes, spacing, locations of structural members, openings, attachments, and fasteners.
 - 2. Connections.
 - 3. Indicate cambers and loads.
 - 4. Indicate welded connections with AWS A2.4 welding symbols. Indicate net weld lengths.
- 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. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.
- E. Paint and primer manufacturer and specification sheet.

1.05 QUALITY ASSURANCE

- A. Fabricate structural steel members in accordance with AASHTO Standard Specifications for Highway Bridges, 16th Edition including all interim specifications.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. All Structural Steel Members: ASTM A 36 unless otherwise noted.
- B. High-Strength, Corrosion-Resistant Structural Steel: ASTM A 588 including: girders, stiffeners, separators and splices.
- C. Shear Stud Connectors: Made from ASTM A 108 Grade 1015 bars.
- D. High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, medium carbon, galvanized.
- E. High-Strength Structural Bolts: ASTM A490, with matching ASTM A 563 nuts and ASTM F 436 washers; Type 3 weathering steel.
- F. High-Strength Anchor Bolts: ASTM A 490, Type 3 weathering steel.
- G. Welding Materials: AWS D1.1; type required for materials being welded.
- H. Sliding Bearing Plates: As per plans.
- I. Paint System: as per NDOT Approved Products List for Shop Painting and TNEMEC 90-97 or approved equal for Field Painting.
- J. Bearing Pads: as per NDOT Section 1068.

2.02 FABRICATION

- A. Shop fabricate to greatest extent possible.
- B. Space shear stud connectors as per plan.
- C. Continuously seal joined members by continuous welds. Grind exposed welds smooth.
- D. Fabricate connections for bolt, nut, and washer connectors.
- E. Develop required camber for members.

2.03 FINISH

- A. Shop paint structural steel girders, separators, splices and stiffeners for superstructure. Not applicable for weathering steel.
 - 1. Shop painting with approved NDOT paint system.
- B. Field paint all steel surfaces not shop painted. Do not prime surfaces that will be fireproofed, field welded, in contact with concrete, or high strength bolted.
 - 1. Brush and toll clean exposed steel surfaces to remove rust and dirt. Remove all oil, grease, chalk marks, etc. Engineer shall approve surface prep before paint application.
 - 2. Surfaces to be primed only, no finish coat.
 - 3. Primer to be on approved products list.

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. Erect structural steel in compliance with NDOT and AASHTO Specifications.
- 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 indicated on shop drawings.
- D. Do not field cut or alter structural members without approval of Engineer.
- E. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.

END OF SECTION

SECTION 09 96 10
HIGH-PERFORMANCE COATINGS WATER AND WASTEWATER ENVIRONMENTS

PART 1 - GENERAL

1.01 SUMMARY

- A. General Intention:
 - 1. The work covered under this specification includes applications for high-performance coatings to equipment, piping or other miscellaneous materials typically associated with potable drinking water and wastewater facilities and structures.
 - 2. The types of applications for coating included in this Section generally include, but are not limited to: submerged and non-submerged equipment, ferrous and non-ferrous piping, ferrous mechanical treatment equipment, pumps, steel piping supports and other items as shown in the Drawings or otherwise noted in the Specifications.
- B. Section Includes:
 - 1. The work under this section includes furnishing all materials, equipment, tools and labor for surface preparation, priming and painting necessary to complete the application of the high-performance coatings, as shown in the Drawings and Specifications.
- C. Contractor Responsibility:
 - 1. The Contractor shall be responsible for performing all the work called for in this specification, in a safe and workmanlike manner.

1.02 REFERENCES

- A. ASTM B 117 – Standard Practice for Operating Salt Spray (Fog) Apparatus
- B. ASTM D 16 – Standard Terminology for Paint, Related Coatings, Materials, and Applications
- C. ASTM D 520 – Standard Specification for Zinc Dust Pigment
- D. ASTM D 870 – Standard Practice for Testing Water Resistance of Coatings Using Water Immersion
- E. ASTM D 1005 – Test for determining dry film thickness
- F. ASTM D 1014 – Standard Practice for Conducting Exterior Exposure Tests of Paints and Coatings on Metal Substrates
- G. ASTM D 2370 – Standard Test Method for Tensile Properties of Organic Coatings
- H. ASTM D 2794 – Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
- I. ASTM D 3359 – Test Method for Measuring Adhesion by Tape Test
- J. ASTM D 4060 – Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser
- K. ASTM D 4141 – Standard Practice for Conducting Black Box and Solar Concentrating Exposures of Coatings

- L. ASTM D 4263 – Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
- M. ASTM D 4417 – Test for determining surface profile
- N. ASTM D 4541 – Test Method for Pull Off Strength of Coatings Using Portable Adhesion-Testers
- O. ASTM D 4585 – Standard Practice for Testing Water Resistance of Coatings Using Controlled Condensation
- P. ASTM D 4587 – 11 Standard Practice for Fluorescent UV-Condensation Exposures of Paint and Related Coatings
- Q. ASTM G 8 – Standard Test Methods for Cathodic Disbonding of Pipeline Coatings
- R. The Society for Protective Coatings:
 - 1. SSPC-SP1 Specification for Solvent Cleaning
 - 2. SSPC-SP2 Specification for Hand Tool Cleaning
 - 3. SSPC-SP3 Specification for Power Tool Cleaning
 - 4. SSPC-SP5 Specification for White Metal Blast Cleaning
 - 5. SSPC-SP6 Specification for Commercial Blast Cleaning
 - 6. SSPC-SP7 Specification for Brush-Off Blast Cleaning
 - 7. SSPC-SP10 Specification for Near White Metal Blast Cleaning
 - 8. SSPC-SP11 Specification for Power Tool Cleaning to Bare Metal
 - 9. SSPC-PA1 Painting Application Specification
 - 10. SSPC-PA2 Measurement of Dry Paint Thickness with Magnetic Gages
 - 11. SP WJ-1 Waterjet Cleaning of Metals - Clean to Bare Substrate
 - 12. SP WJ-2 Waterjet Cleaning of Metals - Very Thorough Cleaning
 - 13. SP WJ-3 Waterjet Cleaning of Metals - Thorough Cleaning
 - 14. SP-WJ-4 Waterjet Cleaning of Metals – Light Cleaning
- S. ASME A13.1 – Scheme for the Identification of Piping Systems
- T. AWWA D102 Standard for Coating Steel Water-Storage Tanks
- U. NSF/ANSI Standard 61: Drinking Water System Components -- Health Effects

1.03 DEFINITIONS

- A. Terms Coating or Paint shall, in a general sense, refer to primers, alkyds, latex, polyurethane, enamels and epoxy type coatings, including emulsions, stains, sealers, fillers and other applied materials, whether used as prime, intermediate or finish coats, and the application of these materials.
- B. Dry Film Thickness (DFT): Thickness, measured in mils (1/1000 inch), of a coat of paint in a cured state.

1.04 SUBMITTALS

- A. Product Data:
 - 1. Submit manufacturer's literature describing products to be provided, giving manufacturer's name, product name, and product line number for each material.

2. Submit technical data sheets for each product, giving descriptive data, including solids content.
 3. Submit color charts showing manufacturer's full range of standard colors, for each product.
 4. Submit manufacturer's warranty, for each product.
 5. Submit a list of similar installations where the product was used.
- B. Submit Manufacturer's Application Instructions:
1. Manufacturer's application instructions shall include:
 - a. Application equipment to be used.
 - b. Thinning instructions.
 - c. Mixing instructions.
 - d. Recommended thickness, dry film thickness, DFT, mils, to be applied, per coat.
 - e. Curing time for each coat applied.
 - f. Temperature limitations for storage and application.
- C. Certificate:
1. Provide manufacturer's certification that products to be used comply with specified requirements (including Performance Requirements stated) and are suitable for intended application.

1.05 QUALIFICATIONS:

- A. Manufacturer shall have specialized in the manufacturing of potable water, sanitary and marine style coatings with a minimum of 10 years experience in that field.
- B. Manufacturer and authorized sales representative shall have evidence of 10 years of successful experience in providing coatings of the type, design, function and quality within either the State or 120 miles of the project site.
- C. Painter shall be trained in surface preparation and application techniques and procedures for the coating materials used and shall demonstrate a minimum of 2 (two) years experience in application of the coating materials used.
- D. Contractor shall maintain, throughout duration of application, a crew of painters who are experienced and fully qualified.

1.06 DELIVERY AND STORAGE

- A. Packing and Shipping:
 1. Deliver only products in manufacturer's original unopened containers. Each container shall have manufacturer's label, intact and legible.
 2. Provide Material Safety Data Sheets (MSDS), for all material provided.
 3. Include on label for each container:
 - a. Manufacturer's name
 - b. Type of coating material
 - c. Manufacturer's stock number and lot number
 - d. Color name and number
 - e. Instructions for thinning, where applicable

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- B. Storage and Protection:
 - 1. Store materials in conformity with manufacturer's printed instructions.

PART 2 - PRODUCTS

2.01 COATING MATERIALS

- A. Single Source Responsibility:
 - 1. Undercoats shall be produced by same manufacturer as the finish coat(s).
 - 2. Undercoats and finish coat(s) shall be approved by manufacturer as suitable for use with each other, for the surface being painted and the environment outlined in the Drawings and Specifications that will allow the paint system to function properly.
- B. Coating materials shall arrive on the job ready-mixed, except for tinting of undercoats, possible thinning, and mixing of multi-component products. Specific product mixing and thinning instructions shall be provided by the manufacturer.
- C. Provide secondary materials, which are produced or are specifically recommended by coating system manufacturer to ensure capability of system.
 - 1. Use only thinners approved by coating materials manufacturer, and use only within manufacturer's recommended limits.
- D. When applied to potentially immersed Potable Water Equipment, Tanks and Piping, paint/coating materials shall be NSF/ANSI Standard 61 Approved.
- E. Coating materials manufacturer shall demonstrate and document compliance with performance requirements for coating materials.

2.02 POLYAMIDOAMINE EPOXY, TWO COMPONENT

- A. Acceptable Surface Temperatures:
 - 1. Minimum: 50 degree F
- B. Cure Time at 60 degrees F:
 - 1. Handle: 8 hours maximum
- C. Performance Requirements:
 - 1. Humidity per ASTM D 4585 Standards: No blistering, cracking, checking, rusting or delamination of film after 10,000 hours exposure.
 - 2. Abrasion per ASTM D 4060 Standards: CS-17 Wheel, 1,000 gram load: 140 mg loss maximum after 1,000 cycles.
 - 3. Adhesion per ASTM D 4541 Standards: Type V Tester: 1,750 psi minimum.
 - 4. Salt Fog Spray per ASTM B 117 Standards: No blistering, cracking or delamination of film. No more than 1% rusting on plane. No more than 1/16" rust creepage at scribe after 6,700 hours exposure.

2.03 POLYFUNCTIONAL ALIPHATIC POLYURETHANE, TWO COMPONENT

- A. Acceptable Surface Temperatures:
 - 1. Minimum: 35 degree F
- B. Cure Time at 55 degrees F:
 - 1. Handle: 12 hours maximum

- C. Performance Requirements:
 - 1. Exterior Exposure per ASTM D 4141 Standards, Method C: No blistering, cracking or chalking. 97% gloss retention and 0.11 DEHunter color change minimum after 500 MJ/m2 EMMAQUA exposure.
 - 2. Abrasion per ASTM D 4060 Standards, CS-17 Wheel, 1,000 gram load: 120 mg loss maximum after 1,000 cycles.
 - 3. QUV Exposure ASTM D 4587 Standards: No Blistering, cracking, chalking, no less than 84% gloss retention; no more than 1.31 DED CIELAB color change after 10,000hrs exposure.
 - 4. Impact Resistance per ASTM D 2794 Standards: No visible cracking or delamination after 16 inch-pounds, minimum, direct impact.

2.04 ZINC EPOXY PRIMER COATING/PAINT:

- A. Two component, moisture cured, zinc-rich epoxy primer.
- B. When applied to potentially immersed Potable Water Equipment and Piping, shall be NSF/ANSI Standard 61 Approved.
- C. Base Materials and Requirements:
 - 1. Can be topcoated with Epoxies, Polyurethanes and Acrylics
 - 2. Zinc Pigment:
 - a. ASTM D 520, Type II or Type III
 - b. Lead content: 0.002% or less
- D. Acceptable Surface Temperatures:
 - 1. Minimum: 35 degree F
- E. Cure Time at 55 degrees F:
 - 1. Handle: 5 hours maximum
- F. Performance Requirements:
 - 1. Cathodic Disbondment per ASTM G8 Standards, Method A: No blistering, cracking, rusting or delamination and no undercutting at holiday after 30 days exposure.
 - 2. Adhesion per ASTM D 4541 Standards, Method E, Type V Tester: 2,000 psi minimum.
 - 3. Salt Fog Spray per ASTM B 117 Standards: No blistering, cracking or delamination of film. No more than 1% rusting on plane. No more than 1/8" rust creepage at scribe after 50,000 hours exposure.

2.05 HYDROPHOBIC AROMATIC POLYURETHANE, TWO COMPONENT

- A. Acceptable Surface Temperatures:
 - 1. Minimum: 35 degree F
- B. Cure Time at 60 degrees F:
 - 1. Handle: 10 hours maximum
- C. Performance Requirements:
 - 1. Tensile Strength ASTM D 2370 Standards: No less than 2,693 psi (18.6 MPa) tensile strength.

2. Abrasion per ASTM D 4060 Standards, CS-17 Wheel, 1,000 gram load: 114 mg loss maximum after 1,000 cycles.
3. Adhesion per ASTM D 4541 Standards, Type V Tester: 1,300 psi minimum.
4. Impact per ASTM D 2794 Standards: No visible cracking or delamination of film after 48 inch-pounds or less direct impact
5. Severe Wastewater Analysis Testing: Initial impedance of 10.2 (log-Z). No blistering, cracking, checking or loss of adhesion. No more than 0.1 (log-Z) reduction in electrical impedance after 28 days exposure.

2.06 POLYAMIDOAMINE EPOXY: TWO COMPONENT, HIGH-BUILD EPOXY.

- A. Base Materials and Requirements:
 1. Potable water immersed ferrous materials, equipment and pipe.
- B. Acceptable Surface Temperatures:
 1. Minimum: 35 degree F
- C. Cure Time at 55 degrees F:
 1. Handle: 14 hours maximum
 2. Topcoat: 24 hours maximum
 3. Immersion: 10 days maximum
- D. Performance Requirements:
 1. Humidity per ASTM D 4585 Standards: No blistering, cracking, checking, rusting or delamination of film after 10,000 hours exposure.
 2. Abrasion per ASTM D 4060 Standards, CS-17 Wheel, 1,000 gram load: 140 mg loss maximum after 1,000 cycles.
 3. Adhesion per ASTM D 4541 Standards, Type V Tester: 1,750 psi minimum.
 4. Salt Fog Spray per ASTM B 117 Standards: No blistering, cracking or delamination of film. No more than 1% rusting on plane. No more than 1/16" rust creepage at scribe after 6,700 hours exposure.

2.07 PIPE BANDING AND LABELS

- A. Comply with 2007 ASME A13.1 Standards
- B. Shall designate the material conveyed in the piping and the general flow direction.
- C. Materials:
 1. Coiled Rigid Vinyl or Strap-On Rigid Vinyl with Nylon Ties
 - a. Engineer approved equal
 2. Shall wrap 360 degrees around the pipe.
 3. Printed with UV resistant ink
 4. Service Temp: -40 to 180 degrees F
- D. Colored banding on piping or similar installations shall be placed:
 1. 10 feet spacing, maximum.
 2. At all changes in direction.
 3. Both sides of obstructions
- E. Band width:

1. 2 inches for pipes up to 8 inches in diameter.
 2. 4 inches for pipes over 8 inches and up to 24 inches in diameter.
 3. 8 inches for pipes over 24 inches in diameter
- F. Arrow and Letter Heights:
1. Pipes smaller than 4": 1" height lettering, minimum
 2. Pipes 4" or larger: 2" height lettering, minimum

2.08 COLOR

- A. See Section 01 10 00 – Special Provisions.
- B. When the color is not stated elsewhere, the color shall be selected by the Owner from the manufacturer's standard color chart for the product used.
- C. The following general colors and schemes shall be utilized when coating materials listed within in this Section. Contractor to coordinate all final color selections with the Engineer prior to application of materials.

D.	<u>Location/Purpose:</u>	<u>Generic Color(s):</u>
1.	Raw Drinking Water	Olive Green
2.	Settled or Clarified Drinking Water	Aqua
3.	Finished or Potable Water	Dark Blue
4.	Sewage Plant Effluent	Clay
5.	Backwash Waste	Light Brown
6.	Sludge	Dark Brown
7.	Sanitary Sewer	Dark Gray
8.	Alum or Primary Coagulant	Orange
9.	Ammonia	White
10.	Carbon Slurries	Black
11.	Caustic Solutions	Yellow w/ Green Band
12.	Chlorine	Yellow
13.	Fluoride	Light Blue w/ Red Band
14.	Lime Slurries	Light Green
15.	Ozone	Yellow w/ Orange Band
16.	Phosphate	Light Green w/ Red Band
17.	Polymer or Coagulant Aid	Orange w/ Green Band
18.	Permanganates	Violet
19.	Soda Ash	Light Green w/ Orange Band
20.	Sulfuric Acid	Yellow w/ Red Band
21.	Sulfur Dioxide	Light Green w/ Yellow Band
22.	Compressed Air	Dark Green
23.	Gas	Red
24.	Other	Light Gray or Consult Engineer

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verification of Site Conditions:

1. Examine the site and surroundings, and the environment under which the surface preparation and painting will be performed for, conditions that will adversely affect the execution of the work, permanence or quality of the coating.
2. Correct conditions detrimental to timely and proper execution of the work.
3. Do not proceed until unsatisfactory conditions have been corrected.
4. Commencement of surface preparation and painting by Contractor constitutes Contractor acceptance of the site conditions and the responsibility for satisfactorily completing the work.

3.02 PREPARATION

A. Surface Preparation - General Requirements:

1. Prior to application, the surfaces shall be properly prepared to receive the specified coatings in compliance with manufacturer's recommendations.
2. Surfaces to be coated shall be clean, dry and free from dust and any foreign matter which would adversely affect durability, adhesion or appearance of the coating.

B. Protection:

1. Take precautionary measures to prevent fire hazards and spontaneous combustion.
2. Provide drop cloths, shields, and other protective equipment.
3. Protect elements surrounding the work from damage or disfiguration.
4. Protect all of the worksite and surroundings, whether to be painted or not, against damage by the surface preparation, painting, finishing and cleanup work.
5. Protect newly coated areas against damage.
6. Protect the work of other trades, whether to be painted or not, against damage by surface preparation, painting, finishing and cleanup work.
7. Protect all electrical items including controls, switches, outlets, lights, and panels against damage by surface preparation, painting, finishing and cleanup work.

C. Shop and Field Surface Preparation:

1. Remove all oil, grease, soil, dirt and other soluble contaminants in accordance with SSPC-SP1.
2. Repair any damaged or corroded areas and weld where necessary, with inspection by Engineer, following repair. Weld slag, weld spatter, rough edges and sharp edges of weld seams shall be ground smooth.
3. All rusted, abraded and unpainted areas shall be abrasive blast cleaned in accordance with the recommended methods outlined in manufacturer's

preparation requirements for the environment outlined in the Drawings and Specifications.

4. Immediately after blasting and before any rusting occurs, apply one coat of primer to all bare ferrous metal surfaces.

3.03 FACTORY OR SHOP PRIMED MATERIALS

- A. Application of the primer coating is permitted to occur away from the project site with proper inspection documentation outlined later in this Section.
- B. Field preparation of ferrous components that have a predominant shop primed surface will remain necessary at locations such as welded seams, damaged areas or components that otherwise do not have shop primer applied.
- C. Shop primed materials are not required to be further blasted bare nor additionally primed other than for repairs, surface preparation and cleaning purposes or increasing the thicknesses of the material previously applied.
- D. At material locations where the primer coating has been damaged or destroyed, it shall be repaired in the field or returned to the factory/shop.
 1. The primer located within a 2-inch radius of the damaged area shall be removed using a power tool or blasting.
 2. The surface shall be re-prepared for application of the primer coating in accordance with the manufacturer's recommendations and Engineer.

3.04 APPLICATION

- A. Environmental Requirements:
 1. Do not apply coating when conditions exist that would adversely affect durability, adhesion or appearance of the coating. Do not apply coating materials in snow, rain, fog or mist, or to damp or wet surfaces, unless otherwise permitted by coating materials manufacturer's printed instructions.
 2. Provide for proper ventilation, using explosion proof equipment, during the surface preparation, application and curing operations.
 3. Provide adequate illumination, using explosion proof lights and equipment, during the surface preparation, application and curing operations.
 4. Atmosphere shall be free of airborne dust and any other contaminate or foreign matter, during the application and initial curing operations.
- B. General Requirements:
 1. Mix and prepare coating in accordance with manufacturer's directions.
 2. Apply coating in compliance with manufacturer's instructions, using application method best suited for obtaining a full uniform coverage of surfaces to be coated and providing a uniform finish, color and appearance.
 3. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
 4. Apply first coat to surfaces that have been cleaned, pretreated or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

5. Apply primer, intermediate, and finish coats to comply with wet and dry film thickness and spreading rates for each type of coating as recommended by manufacturer and herein specified minimums.
 6. Number of coats specified shall be minimum number acceptable.
 - a. Apply additional coats as needed to provide a smooth, even application, with a uniform finish, color and appearance.
 - b. If two coats of the same material is specified, Contractor may, at own cost, apply one single coat of material at the total thickness required with written approval of coating manufacturer and Engineer.
 - c. Closely adhere to re-coat times recommended by manufacturer.
 - d. Provide adequate ventilation during curing phase.
 7. Use only application equipment that is clean, properly adjusted, in good working order and of type recommended by coating manufacturer.
 8. Allow sufficient time between successive coats to permit proper curing.
- C. Field Intermediate Coat:
1. After the topcoating time of the primer is completed, apply one coat of epoxy intermediate coating all primed surfaces.
 2. If primed areas are exposed for more than 30 days, the primed surface shall be brush blasted to clean.
 3. To achieve complete finish coat coverage, the intermediate coat color should be noticeably different than the specified finish coat color. When feasible, the field intermediate coat should be in the same finish coat color family (blue, beige, gray, etc.) with a difference in light reflectance value of approximately 10%.
- D. Field Finish Coat:
1. After the topcoating time of the intermediate coat is completed, apply finish coat to surfaces.
 2. If areas that have received an intermediate coat are not coated again within 30 days, the surface shall be brush blasted to clean, before the succeeding coat is applied.
- E. Coating Application Accessories:
1. Provide application accessories as indicated in coating manufacturer's application instructions, including but not limited to cleaning agents, etching agents, cleaning cloths, sanding materials, and clean-up materials.
 2. Material not specifically identified, but necessary for the proper application of the coating system, shall be provided, and are considered incidental and included in the price.

3.05 ABOVE GRADE PVC PIPING, FITTINGS AND VALVES

- A. Surface Preparation:
1. Scarify
 2. Clean and dry.
- B. Prime Coat:
1. Polyamidoamine Epoxy, two component

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- 2. Finish: Satin
 - 3. Thickness: 2.0 to 3.0 mils DFT
- C. Field Intermediate Coat:
 - 1. Polyamidoamine Epoxy, two component
 - 2. Finish: Satin
 - 3. Thickness: 2.0 to 3.0 mils DFT
- D. Field Finish Coat:
 - 1. This paragraph only applies if pipe is located such to be regularly exposed to outdoor weather conditions.
 - 2. Polyfunctional Aliphatic Polyurethane, two component
 - 3. Finish: High Gloss
 - 4. Thickness: 2.0 to 3.0 mils DFT
- E. Total Dry Film Thickness: 4.0 to 6.0 mils, or 6.0 to 9.0 mils in weather conditions

3.06 ABOVE GRADE DUCTILE IRON PIPING, FITTINGS AND VALVES

- A. Surface Preparation:
 - 1. SP 6 – Commercial Blast
 - 2. 1.5 mils anchor profile.
 - 3. Clean and dry.
- B. Shop and/or Field Prime Coat:
 - 1. Polyamidoamine Epoxy, two component
 - 2. Finish: Satin
 - 3. Thickness: 3.0 to 5.0 mils DFT
- C. Onsite Cleaning of Shop Primed Materials:
 - 1. Field preparation with a power wash over the entire surface with a 3,000 psi power washer or equal to remove all loose paint or other surface contaminants.
- D. Field Intermediate Coat:
 - 1. Polyamidoamine Epoxy, two component
 - 2. Finish: Satin
 - 3. Thickness: 3.0 to 5.0 mils DFT
- E. Field Finish Coat:
 - 1. This paragraph only applies if pipe is located such to be regularly exposed to outdoor weather conditions.
 - 2. Polyfunctional Aliphatic Polyurethane, two component
 - 3. Finish: High Gloss
 - 4. Thickness: 3.0 to 5.0 mils DFT
- F. Total Dry Film Thickness: 6.0 to 10.0 mils, or 9.0 to 15.0 mils in sunlight/weather conditions

3.07 EXTERIOR FERROUS EQUIPMENT (NON-IMMERSED)

- A. Surface Preparation:
 - 1. SP 10 – Near White Metal Blast Cleaning
 - 2. 1.5 mils anchor profile.
 - 3. Clean and dry.
- B. Shop and/or Field Prime Coat:
 - 1. Zinc epoxy primer coating/paint
 - 2. Thickness: 2.5 to 3.5 mils DFT
- C. Onsite Cleaning of Shop Primed Materials:
 - 1. Field preparation with a power wash over the entire surface with a 3,000 psi power washer or equal to remove all loose paint or other surface contaminants.
- D. Field Intermediate Coat:
 - 1. Polyamidoamine Epoxy, two component
 - 2. Finish: Satin
 - 3. Thickness: 2.0 to 3.0 mils DFT
- E. Field Finish Coat:
 - 1. Polyfunctional Aliphatic Polyurethane, two component
 - 2. Finish: High Gloss
 - 3. Thickness: 2.0 to 5.0 mils DFT
- F. Total Dry Film Thickness: 6.5 to 11.5 mils

3.08 INTERIOR FERROUS EQUIPMENT (NON-IMMERSED)

- A. All rusted, abraded and unpainted areas shall be abrasive blast cleaned in accordance with the recommended methods outlined in The Society for Protective Coatings Specification SSPC-SP6 (NACE No. 3).
- B. Surface Preparation:
 - 1. SP 6 – Commercial Blast
 - 2. 1.5 mils anchor profile.
 - 3. Clean and dry.
- C. Shop and/or Field Primer Coat:
 - 1. Zinc epoxy primer coating/paint
 - 2. Thickness: 2.0 to 3.0 mils DFT
- D. Onsite Cleaning of Shop Primed Materials:
 - 1. Field preparation with a power wash over the entire surface with a 3,000 psi power washer or equal to remove all loose paint or other surface contaminants.
- E. Field Finish Coat:
 - 1. Polyamidoamine Epoxy, two component
 - 2. Finish: Satin
 - 3. Thickness: 2.0 to 3.0 mils DFT
- F. Total Dry Film Thickness: 4.0 to 6.0 mils

3.09 IMMERSED FERROUS EQUIPMENT AND PIPING

- A. Immersed environment shall be considered to be where the material is regularly immersed in, or within six inches of splashing materials, such as; water, chemicals or wastewater sludge.
- B. All rusted, abraded and unpainted areas shall be abrasive blast cleaned in accordance with the recommended methods outlined in The Society for Protective Coatings Specification SSPC-SP10 (NACE No. 2).
- C. Surface Preparation:
 - 1. SP 10 – Near White Metal Blast Cleaning
 - 2. 1.5 mils anchor profile.
 - 3. Clean and dry.
- D. Shop and Field Primer Coat:
 - 1. Hydrophobic Aromatic Polyurethane, two component
 - 2. Finish: Satin
 - 3. Thickness: 7.0 to 10.0 mils DFT
- E. Onsite Cleaning of Shop Primed Materials:
 - 1. Field preparation with a power wash over the entire surface with a 3,000 psi power washer or equal to remove all loose paint or other surface contaminants.
- F. Field Finish Coat:
 - 1. Hydrophobic Aromatic Polyurethane, two component
 - 2. Finish: Satin
 - 3. Thickness: 7.0 to 10.0 mils DFT
- G. Total Dry Film Thickness: 14.0 to 20.0 mils

3.10 POTABLE WATER IMMERSED FERROUS EQUIPMENT AND PIPING

- A. Immersed environment shall be considered to be where the material is regularly immersed in, or within six inches of splashing materials, such as; water or chemicals.
- B. Meet AWWA D102-06 Standards for Inside Coating System No. 5
- C. All rusted, abraded and unpainted areas shall be abrasive blast cleaned to a near white finish in accordance with the recommended methods outlined in The Society for Protective Coatings Specification SSPC-SP10 (NACE No. 2).
- D. Surface Preparation:
 - 1. SP 10 – Near White Metal Blast Cleaning
 - 2. Clean and dry.
- E. Shop and Field Prime Coat:
 - 1. Zinc epoxy primer coating/paint
 - 2. Thickness: 2.5 to 3.5 mils DFT
- F. Onsite Cleaning of Shop Primed Materials:
 - 1. Field preparation with a power wash over the entire surface with a 3,000 psi power washer or equal to remove all loose paint or other surface contaminants.

- G. Field Intermediate Coat:
 - 1. Polyamidoamine Epoxy: Two component, HIGH-BUILD EPOXY.
 - a. NSF/ANSI Standard 61 Approved
 - 2. Thickness: 4.0 to 6.0 mils DFT
- H. Field Finish Coat:
 - 1. Polyamidoamine Epoxy: Two component, HIGH-BUILD EPOXY.
 - a. NSF/ANSI Standard 61 Approved
 - 2. Thickness: 4.0 to 6.0 mils DFT
- I. Total Dry Film Thickness: 10.5 to 15.5 mils

3.11 FIELD QUALITY CONTROL

- A. Daily Records: The following information shall be recorded for each day of coatings application for each type of material applied.
 - 1. Date, starting and ending times.
 - 2. Atmospheric conditions, including precipitation, temperature and wind.
 - 3. Surface temperature of material that coating is applied to.
- B. Measure and document wet film thickness of each coating every 100 feet of piping or 200 square feet of flat surfacing, whichever is less. A minimum of 3 tests per location shall be taken.
- C. Provide 'wet paint' signs in areas where coating activity is taking place and/or coating is curing.
- D. The Contractor shall prepare and deliver to the Owner an inspection log setting forth the number of tests taken and results of each test. All logs shall note the date of the test and person making the inspection. Any thickness not met, type of failures observed and the percentage of the surface area where failure has occurred shall be included to the extent possible. Color photographs illustrating each type of failure shall be included in the log(s).

3.12 REPAIR/RESTORATION

- A. At completion of the work, touch-up and restore finishes where damaged.
 - 1. Touch-up of minor damage shall be acceptable where result is not visibly different from surrounding surfaces.
 - 2. Where result is visibly different; either in color, sheen or texture, recoating of the entire surface shall be done.
- B. When stain, dirt, or undercoats show through finish coat, correct defects and cover with additional coats until coating is of uniform finish, color, appearance and coverage.

3.13 CLEANUP

- A. Leave storage area neat and clean at all times.
- B. As the work proceeds, promptly remove spilled, splashed or splattered materials from surfaces.
- C. Remove splattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.

- D. Upon completion of the painting work, clean window glass and other paint spattered surfaces.

3.14 WASTE MANAGEMENT

- A. General Requirements:
 - 1. During progress of the work, at end of each workday, remove from site discarded paint materials, rubbish, cans and rags.
 - 2. Place materials defined as hazardous or toxic waste in designated containers.
 - 3. Return solvent and oil soaked rags for contaminant recovery and laundering, or for proper disposal.
 - 4. Do not dispose of coating materials or solvents by pouring on ground. Place in designated containers for proper disposal.
 - 5. Contractor shall be responsible for all costs associated with waste disposal that may result from execution of this Project.

END OF SECTION

SECTION 31 10 00
SITE CLEARING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. General:
 - 1. Remove surface debris.
 - 2. Removal of vegetation and sod.
 - 3. Remove trees, shrubs and other plants.
 - 4. Remove root system of trees and shrubs.
 - 5. Disposal.

1.02 REFERENCES

- A. State Standard Specifications, latest edition, including all current supplemental specifications.

1.03 REGULATORY REQUIREMENTS

- A. Conform to local, state, and federal regulations for disposal of debris.
- B. Contractor shall obtain, at Contractor's own expense, all permits or licenses for the use and maintaining of dumps and waste areas.
- C. Coordinate clearing work with utility Owners.
- D. Conform to local, state, and federal regulations for preparation and implementation of erosion control plan.

1.04 UNIT PRICES

- A. General Clearing and Grubbing:
 - 1. Includes:
 - a. Clearing: Removal and disposal of all unwanted material from the surface, such as trees/stumps vegetation, boulders and trash.
 - b. Grubbing: Removal and disposal of all unwanted materials from underground, such as boulders, stumps, roots or other debris.
 - c. Backfill: Backfill required to fill cavities as a result of any removal shall be included in the cost of the clearing and grubbing.
 - 2. Method of Measurement and Pay Unit: By the lump sum.
- B. Tree and/or Stump Removal:
 - 1. Includes trees and stumps (including root ball) that the circumference exceeds 80 inches at 40 inches above ground level (or the circumference exceeds 80 inches at ground level if stump only). Backfill required to fill cavities as a result of the removals shall be included in the cost of the removal.

2. Method of Measurement and Pay Unit: By each tree/stump removed.

1.05 PROJECT CONDITIONS

- A. Conform to applicable regulations relating to environmental requirements, disposal of debris, use of herbicides and hazardous materials.
- B. Coordinate clearing work with utility companies.
- C. Protect utilities to remain from damage.
- D. Protect trees, plants, amenities and other features designated to remain as final landscaping.
- E. Protect benchmarks, survey control points and existing structures from damage or displacement.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. See Section 31 23 23 – Fill and Backfill for material specifications.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Locate and identify utilities to remain. Tag utilities to be removed.
- B. Verify that existing plants designated to remain are tagged or identified.
- C. Tag existing plants designated to remain.
- D. Identify a waste area/salvage area for placing removed materials.

3.02 CLEARING

- A. Clear areas required for access to site and execution of work.
- B. Remove trees, shrubs and stumps within limits of construction (LOC).
- C. Remove roots to a depth of 36 inches.
- D. Clear undergrowth and deadwood without disturbing subsoil.
- E. Remove existing sod or vegetation without disturbing topsoil.

3.03 REMOVAL

- A. Remove surface rock.
- B. Remove debris from site.

3.04 SALVAGED MATERIALS

- A. Carefully remove, load, transport, unload, and store materials and items designated as salvage.
- B. Reinstall salvage material and items as shown in the plans.

3.05 DISPOSAL

- A. Remove waste material from project site promptly as it is generated by construction operations; do not permit to accumulate. Unless directed, do not remove topsoil from the site.
- B. Remove brush, trees, stumps, roots, rubbish, spoil, excess excavated material and material not suitable for backfill to off-site location of Contractor's choice, cost to be incidental to the removal.
- C. Disposal areas shall be Contractor's responsibility unless otherwise indicated in Section 01 10 00 - Special Provisions.
- D. Grade final cover to allow for positive surface drainage.
- E. Haul Routes:
 - 1. Determine haul roads with approval of agency having jurisdiction over proposed roadway.
 - 2. Make condition survey of haul roads prior to use and document with necessary photographs and written descriptions.
 - 3. Keep reasonably free from dirt, dust, mud and other debris from construction operations.
 - 4. Clean a minimum of twice a week.
 - 5. Repair any damaged haul roads to match existing conditions before use.
 - 6. No extra payment shall be made for removals regardless of disposal locations.
 - 7. Temporary haul routes (roads) developed by the Contractor shall be completely removed at the completion of the project and the area returned to its original condition. The cost of temporary haul routes shall be incidental to the cost of the project.

END OF SECTION

SECTION 31 23 33
TRENCHING FOR UTILITIES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Excavation, backfilling and compacting for utilities.

1.02 REFERENCES

- A. AASHTO T 180 - Standard Specification for Moisture - Density Relations of Soils Using a 4.54 kg (10-lb) Rammer and a 457 mm (18 in.) Drop; American Association of State Highway and Transportation Officials.
- B. ASTM C 136 - Standard Test Method for Sieve Analysis of Fine Coarse Aggregates.
- C. ASTM D 698 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
- D. ASTM D 1556 – Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method.
- E. ASTM D 1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)).
- F. ASTM D 2167 – Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
- G. ASTM D 2487 – Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
- H. ASTM D 6938 – Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
- I. ASTM D 4318 – Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- J. State Standard Specifications for Highway Construction, latest edition, including all current supplemental specifications.

1.03 METHOD OF PAYMENT

- A. Excavation, trenching, backfilling, moisture condition and compaction are subsidiary items that are not measured for payment and for which no direct payment shall be made. Contractor must include the cost of performing this work in a related item that is identified in the plans and specifications which is measured for payment and for which direct payment is made.
 - 1. Includes excavating to required elevations. The loading, hauling and disposal of surplus material at a site of the contractor's choice is considered subsidiary.
- B. Unsuitable Materials:
 - 1. Includes excavating materials which are determined by Engineer to be unsuitable as subgrade for pipe and/or structures, loading and removal of

unsuitable material to a site of the contractor's choice, and furnish and backfill with materials specified by Engineer.

2. Method of Measurement and Pay Unit: By the cubic yard (measured in place).

1.04 SUBMITTALS

- A. Samples: 60 pound sample of each type of fill. Submit in airtight containers to testing laboratory.
- B. Materials Sources: Submit name of imported materials source.
- C. Fill Composition Test Reports: Results of laboratory tests on proposed and actual materials used.
- D. Compaction density test reports.

1.05 PROJECT CONDITIONS

- A. Provide sufficient quantities of fill to meet project schedule and requirements. When necessary, store materials on-site in advance of need.
- B. When fill materials need to be stored on-site, locate stockpiles where designated. See Engineer.
 1. Separate differing materials with dividers or stockpile separately to prevent intermixing.
 2. Prevent contamination.
 3. Protect stockpiles from erosion and deterioration of materials.
- C. Verify that survey benchmarks and intended elevations for the work are as indicated. Notify Engineer immediately if a discrepancy is identified.
- D. Protect plants, lawns, rock outcroppings, trees, amenities and other features to remain.
- E. Protect benchmarks, survey control points, existing structures, fences, sidewalks, paving, curbs, utility pedestals and amenities from excavating equipment and vehicular traffic.
- F. Provide exploratory excavation to determine exact location of existing underground structures or utilities.

PART 2 - PRODUCTS

2.01 FILL MATERIALS

- A. See Section 31 23 23 – Fill and Backfill for material specifications.
- B. Refer to the Drawing, Section 01 10 00 – Special Provision, and/or geotechnical report for specific bedding material requirements.

2.02 SOURCE QUALITY CONTROL

- A. Where fill materials are specified by reference to a specific standard, test and analyze samples for compliance before delivery to site.
- B. If tests indicate materials do not meet specified requirements, change material and retest.

- C. Provide materials of each type from same source throughout the work.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Identify required lines, levels, contours and datum locations.

3.02 TRENCHING

- A. Notify Engineer of unexpected subsurface conditions and discontinue affected work in areas until notified to resume work.
- B. Slope banks of excavation deeper than 3 feet to angle of repose or less until shored.
 - 1. Install shoring to protect pavements and structures or where backsloping is impractical.
 - 2. Pile excavated material beyond edge of trench to prevent slides and cave-in.
- C. Stockpile topsoil material for placement in areas disturbed by construction.
- D. Do not interfere with 45 degree bearing splay of foundations.
- E. Cut trenches wide enough to allow inspection of installed utilities.
- F. Bottom width of trench not less than 8 inches nor more than 12 inches on each side of pipe, or as indicated on the Plans.
- G. Hand trim excavations. Remove loose material.
- H. Remove large stones and other hard matter which could damage piping or impede consistent backfilling or compaction.
- I. Remove lumped subsoil, boulders and rock.
- J. Remove excavated material that is unsuitable for reuse from site.
- K. Stockpile excavated material to be reused in area designated on-site.
- L. Remove excess excavated material from site.

3.03 PREPARATION FOR UTILITY PLACEMENT

- A. Cut out soft areas of subgrade not capable of compaction in place. Backfill with specified fill.
- B. Compact subgrade to density equal to or greater than requirements for subsequent fill material. See Geotechnical Report.
- C. Until ready to backfill, maintain excavations and prevent loose soil from falling into excavation.
- D. Provide uniform bearing for each pipe section.
 - 1. Round bottom of trench to allow at least 1/4 of the circumference to rest firmly on undisturbed earth.
 - 2. Excavate holes for pipe bells.
- E. Verify that trace wire has been installed and is unbroken or damaged.

3.04 BEDDING AND BACKFILLING

- A. Backfill to contours and elevations indicated using unfrozen materials.
- B. Employ a placement method that does not disturb or damage other work.
- C. Do not fill over porous, wet, frozen or spongy subgrade surfaces.
- D. Adjust and maintain optimum moisture content of fill and backfill materials to attain required compaction density.
- E. Fill: Place and compact materials in equal, continuous layers.
- F. Place bedding material as indicated on the drawings.
- G. Manually backfill under pipe haunches and around bells.
 - 1. Fill in uniform layer on each side of pipe to prevent displacement.
 - 2. Use handheld pneumatic or mechanical compacting equipment.
 - 3. Use manual methods until backfill is a minimum of 12 inches above top of pipe, or as indicated on the Plans.
 - 4. Use caution to prevent damage to trace wire.
- H. Leave shoring in place where required to protect structures or pavement.
 - 1. Cut off top of piling a minimum of 36 inches below subgrade elevation.
- I. Correct areas that are over-excavated.
 - 1. Thrust Bearing Surfaces: Fill with concrete.
 - 2. Other Areas: Use specified fill, flush to required elevation, compacted as per the geotechnical report.
- J. Reshape and recompact areas subjected to vehicular traffic.
- K. Slope grade away from building and structures minimum 2 percent unless noted otherwise. Make gradual grade changes. Blend slope into level areas.

3.05 TOLERANCES

- A. Top Surface of Backfill: Plus or minus 0.08 feet from required elevations.

3.06 FIELD QUALITY CONTROL

- A. Compaction density testing shall be performed on compacted fill in accordance with ASTM D 1556, ASTM D 2167, or ASTM D 6938.
- B. Results shall be evaluated in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D 698 "standard proctor", ASTM D 1557 "modified proctor" or AASHTO T 180.
- C. If tests indicate work does not meet specified requirements, remove work, replace and retest.
- D. Frequency of Tests:
 - 1. Under Paving, Slabs-on-Grade and Similar Construction:

- a. 1 test per 150 linear feet of main line or as determined by Engineer. Test at random depths.
 - b. 1 test of each service line or as determined by Engineer.
- 2. Nonpaved Area:
 - a. 1 test per 300 linear feet of main line or as determined by Engineer. Test at random depths.
 - b. 1 test of each service line or as determined by Engineer.
- E. Proof roll compacted fill at surfaces that will be under slabs-on-grade, pavers and paving.

3.07 CLEANUP

- A. Remove unused stockpiled materials; leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

END OF SECTION

SECTION 31 25 00
EROSION CONTROL

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Storm water pollution prevention plans – SWPPP.
- B. Permits.
- C. Erosion control blanket.
- D. Silt fence.
- E. Straw wattle.
- F. Inlet filters.

1.02 UNIT PRICES

- A. SWPPP or Storm Water Management Plans, construction of erosion control facilities, maintenance, permit compliance responsibilities, erosion control materials, and installation, payment by lump sum, as shown on the Bid Form, and/or refer to Section 01 10 00 - Special Provisions.
- B. Permit Compliance – No separate payment, incidental to project cost.
- C. Erosion control blankets (all types):
 - 1. Method of Measurement and Pay Unit: By the square yard per type or as shown on the Bid Form.
 - 2. Includes matting, filter fabric, staples, placement, delivery, installation and maintenance.
- D. Silt fence (all types):
 - 1. Method of Measurement and Pay Unit: By the lineal foot per type or as shown on the Bid Form.
 - 2. Includes fence, posts, trenching and backfilling, installation and maintenance.
- E. Straw wattles:
 - 1. Method of Measurement and Pay Unit: By the lineal foot per size or as shown on the Bid Form
 - 2. Includes material and installation.
- F. Inlet filters:
 - 1. Method of Measurement and Pay Unit: Included in the cost of the inlet, by each or as shown on the Bid Form
 - 2. Includes material, installation, maintenance, and disposal.

1.03 REFERENCES

- A. Erosion Control Technology Council.
- B. National Pollutant Discharge Elimination System (NPDES) General NPDES Permit Number NER110000.
- C. State Standard Specifications, latest revision.

1.04 PERMITS

- A. NPDES: The Owner is responsible for submitting the Notice of Intent (NOI) to the permitting authority for this project. Once the project is provided a permit number and the proper forms are received, copies will be provided to the Contractor.
 - 1. Under this permit the Contractor will be responsible for:
 - a. Filling out and obtaining signatures on the Start Form. This must be turned in prior to work beginning on the project.
 - b. Installation and removal as called for on plans and in these specifications.
 - c. Maintain the site according to the permit requirements. Erosion control features will be cleaned when they have been 50 percent filled.
 - d. Completing a daily record for erosion control measures installed and condition of those installed previously.
 - e. Maintaining a record of rainfall events and the effects on the erosion control measures.
 - f. Maintain a record of events when the erosion control measures failed and what corrective measures were taken.
 - g. Filling out and obtaining signatures on the End form. This must be turned in at the completion of work on the project.
 - h. Allowing for the inspection of the site by others including; Regulatory Authority, Engineer, Owner or other designated representatives.
 - i. Providing a copy of all documents to Engineer and Owner at completion of project.

PART 2 - PRODUCTS

2.01 EROSION CONTROL BLANKET

- A. The erosion control blanket shall be placed as per the manufacturer's recommendations and the plans. The erosion control blanket shall be placed after the area is seeded and before the area is mulched.
- B. Wire staples shall be used for anchoring the erosion control blanket. The staple pattern shall be per the manufacturers recommendations.
- C. The seed shall comply with the applicable portions of Section 01 10 00 – Special Provisions and Section 32 92 19 - Seeding. The seed mixture shall be of the types and applied at the rate shown in the special provisions.

- D. The fertilizer shall comply with the applicable portion of Section 32 92 19 - Seeding. The fertilizer shall be of the types and applied at the rate shown in the special provisions.
- E. All erosion control mats shall be of type specified in the plans.

2.02 SILT FENCE

- A. The silt fence material shall be of the type specified in the plans.
- B. The stakes shall be as shown in the plans, or as follows:
 - 1. The pins that are required shall be 11 gauge (0.120 inch) steel wire with a 1 inch or larger throat with at least 6-inch legs.
 - 2. Silt fence stakes shall be 5.5 foot studded, steel "T" fence posts.
 - a. Used posts are acceptable.
- C. Stakes for low profile silt fence shall be wood, 1 1/2 inches x 1 1/2 inches x 36 inches.

2.03 STRAW WATTLE

- A. The straw wattles (or sediment logs) shall be of the type, size and length specified in the plans.
- B. The stakes shall be as shown in the plans.
 - 1. Wood stakes shall be 1-1/8" x 1-1/8" x 30" for 9" and 12" straw wattle.
 - 2. Wood stakes shall be 1-1/8" x 1-1/8" x 48" for 20" straw wattle.

2.04 INLET FILTERS

- A. The inlet filters shall be of the type and size as shown on the plans.

PART 3 - EXECUTION

3.01 SWPPP OR STORM WATER MANAGEMENT PLAN

- A. These facilities shall be constructed as shown on the plans. The time frame for construction is set forth in Section 01 10 00 – Specials Provisions or as directed by the Engineer. The SWPPP shall be maintained throughout the duration of the project and until the Engineer has deemed the SWPPP may be closed, transferred to another party or as stated in Section 01 10 00 – Special Provisions.

3.02 EROSION CONTROL BLANKETS

- A. This work shall be performed as soon as possible after finish grading operations have been completed or as directed.
- B. No restrictive seeding time periods shall apply to this work.
- C. Contractor shall tamp and shape fill earth to the finish grade as needed to repair erosion to the grades and conditions shown in the plans.
 - 1. If additional fill dirt is required, it will not be paid for as extra work and must be provided and placed at no additional cost.
- D. Contractor shall perform all work in the areas to be protected so that the land surface is graded smooth and free of all debris, including roots and stones larger than 1 inch in their largest dimensions.

1. All lumps of soil shall be pulverized, raked out or removed.
 2. Vegetation shall be removed from these areas, except for the desirable native vegetation that has been designated by Engineer to remain undisturbed.
 3. The soil in the areas to be protected by the soil retention blanket shall be loosened to a depth of not less than 1 inch by discing, harrowing, raking or other approved methods.
- E. Contractor shall obtain Engineer's approval of all soil preparation work, fertilizer and seed.
- F. Contractor shall place the erosion control blankets immediately following fertilizing and seeding.
1. The blanket shall be laid out flat, parallel to the surface runoff flow direction, and secured as shown in the plans for each specific type of erosion control.
 2. Care shall be exercised in placing the blanket so as not to disturb previously seeded areas.

3.03 SILT FENCE

- A. The silt fence shall be installed and in good working condition prior to any grading operations taking place.
1. Contractor shall excavate a trench to the depth, width and length shown in the plans.
- B. Contractor shall place the silt fence in the trench and pin it as shown in the plans.
1. If the silt fence is installed with mechanical methods, installing pins is not required.
- C. Contractor shall backfill the trench, compact the soil and attach the fabric to the posts as shown in the plans.
1. All silt fence splice joints shall be overlapped a minimum of 16 inches (400 mm).
- D. Contractor shall remove and dispose of silt that accumulates near the silt fence during construction and at completion of the project. Each time silt is removed, the fence shall be repaired to a good working condition.
- E. Contractor shall maintain the silt fence in good working condition at all times.

3.04 STRAW WATTLES

- A. Contractor shall place straw wattles immediately after finish grading is complete in areas where straw wattles are to be constructed or as directed.
- B. Contractor shall install straw wattles as per the plans.
- C. The remainder of the area shall be prepared and the entire area shall be fertilized and seeded in accordance with Standard Specifications or Section 32 92 19 – Seeding.
- D. Contractor shall then place the erosion control blanket and staple it as shown in the plans.
1. If the filter fabric is attached to the erosion control blanket, then the seed shall

be broadcast over the blanket and then the blanket shall be soil filled.

- E. The limits of the completed straw wattles shall extend up the fore slope and back slope of the swale or channel to effectively contain the runoff and prevent erosion and washout at the edges of the installation.
- F. All straw wattles shall be held securely in place.
- G. In shale, the 2 reinforcing steel stakes in each barrier shall be wired together to prevent the barrier from floating off the stakes.
- H. All stakes shall be driven into the ground a minimum of 16 inches.
- I. Contractor shall remove and dispose of silt that accumulates adjacent to the straw wattle.

3.05 INLET FILTERS

- A. Contractor shall install inlet filters immediately after the construction of the inlet structure.
- B. Contractor shall remove and dispose of silt that accumulates in the inlet filter. If the inlet filter becomes damaged, the Contractor shall replace the inlet filter, the cost of such shall be incidental.

3.06 EROSION CONTROL REMOVAL

- A. Contractor shall remove inlet filters, silt fence, straw wattles including stakes and posts, after vegetation has been fully established and as otherwise directed by Engineer (not to exceed 1 year).
- B. Contractor to obtain permission from Engineer prior to the removal of any erosion control materials.

3.07 SWPPP FACILITY REMOVAL

- A. Contractor may be required to remove facilities that were constructed as part of a SWPPP, such as detention or sedimentation basins, accumulated silt, drainage piping, riprap, etc. Refer to Section 01 10 00 – Special Provisions or the Bid Form.
- B. Contractor to obtain permission from the Engineer prior to the removal of any SWPPP Facilities.
- C. Contractor may be required to seed the removal areas. Refer to Section 01 10 00 – Special Provisions or the Bid Form.

END OF SECTION

SECTION 32 92 19

SEEDING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Preparation of seedbed.
- B. Placing topsoil.
- C. Seeding, mulching and fertilizer.
- D. Hydroseeding.
- E. Maintenance.

1.02 SUBMITTALS

- A. Submit from an established seed dealer or grower the certified "blue tag" for each container of seed. This tag will show percentage by weight, percentage of purity, germination and weed seed for each grass, legume and cereal crop stating botanical and common name of each species as specified.

1.03 REGULATORY REQUIREMENTS

- A. Comply with regulatory agencies for seed and fertilizer.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable. Deliver seed mixture in containers showing percentage of seed mix, year of production, net weight, date of packaging and location of packaging.
- B. Deliver fertilizer in waterproof bags showing weight, chemical analysis and name of manufacturer.

1.05 MAINTENANCE

- A. Maintain seeded areas immediately after placement until grass/seed mix is well established and exhibits a vigorous growing condition.
- B. Fill washouts and areas of erosion with topsoil. Contractor is responsible for any and all erosion control measures necessary for the establishment of the specified seed material.
- C. Maintain erosion control.

1.06 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. The work of seeding shall be a per acre, lump sum or as shown on the Bid Form for surfaces seeded in accordance with these specifications. The quantity of completed and accepted work measured as provided herein shall be paid for at the contract price for the item "seeding". This price shall be full compensation for furnishing and applying fertilizer; furnishing and sowing seed; furnishing and applying mulch materials; preparation of the seedbed; and for all materials, labor, equipment, tools and incidentals necessary to complete the work.

PART 2 - PRODUCTS

2.01 FERTILIZER

- A. Fertilizer shall be a standard commercial inorganic product containing nitrogen, available phosphoric acid and soluble potash in a recognized plant food form. This fertilizer shall be either suspendable or soluble in water.
- B. All fertilizer shall comply with the provisions of the State and Local Regulations, with subsequent amendments or revisions thereto. Under these regulations, each brand and grade of commercial fertilizer must be registered. Each container of commercial fertilizer shall have placed on or affixed to the container, in written or printed form, the new weight and the following additional information:
 - 1. The name and address of the person guaranteeing the fertilizing.
 - 2. The brand and grade.
 - 3. The guaranteed analysis showing the minimum percentage of plant food claimed in the following order and form:
 - a. Total nitrogen - percent.
 - b. Available phosphoric acid (P_2O_5) - percent.
 - c. Soluble potash (K_2O) - percent.
 - d. If distributed in bulk, a written or printed statement of the weight and preceding information shall accompany delivery and be supplied to Engineer.
- C. Any grade or mixture of grades of nitrogen and phosphoric acid fertilizer may be used providing the proportions of the minimum rate of application per acre in accordance with the specifications or as directed by Engineer are met.
- D. Fertilizer shall be furnished and delivered in standard bags or bulk.
- E. Rate of application of commercial inorganic fertilizer shall be 200 pounds/acre of 18-46-0, recommended by seed supplier or shown in Section 01 10 00 – Special Provisions.

2.02 SEED MIXTURE

- A. All seeds shall comply with applicable state and federal seed laws.
- B. The seed shall comply with the specified requirements and shall be applied at the rate shown. All seeds shall be certified blue tag. A certified blue tag and analysis tag shall be on every bag.
- C. See Section 01 10 00 – Special Provisions for seed mixture.

2.03 WATER

- A. Clean, fresh and free of substances or matter which could inhibit vigorous growth of grass.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that the prepared soil base is ready to receive the work of this section.

- B. Contractor shall notify Engineer at least 48 hours in advance of the intended time to begin work and shall not proceed with such work until permission to do so has been granted by Engineer.

3.02 PREPARATION

- A. Prepare subgrade and topsoil in accordance with Section 31 22 00 – Grading.
- B. Remove foreign materials, plants, roots, stones and debris from site. Do not bury foreign material.
- C. Remove contaminated soil.
- D. The finish grading must be approved by Engineer before seeding operations begin.

3.03 FERTILIZING

- A. Apply fertilizer at the rate specified.
- B. Apply after smooth raking of topsoil and prior to roller compaction.
- C. Do not apply fertilizer at the same time or with the same machine as will be used to apply seed.
- D. Mix thoroughly into upper 2 inches of topsoil.
- E. Lightly water to aid the dissipation of fertilizer, if required.

3.04 SEEDING

- A. The seedbed shall be prepared by loosening the soil to a depth of not less than 2 inches by discing, harrowing, raking or by other approved means. Several discings, harrowings or similar means may be required to provide a satisfactory seedbed. Discing, harrowing and raking shall be longitudinal on all slopes.
- B. Existing weed stubble and small weeds shall be cut and partially incorporated into the soil during the seedbed preparation work. All other growth of vegetation that will interfere with seeding operations shall be removed. Extreme care shall be exercised to avoid injury to trees and shrubs that have not been designated by Engineer to be removed.
- C. For seeding, approved mechanical power-drawn drills shall be used. Mechanical power-drawn drills shall have depth bands set to maintain a planting depth of 1/2 to 1 inch.
- D. Apply seed at the rate specified evenly in 2 intersecting directions. Rake in lightly.
- E. Planting Season: Seeding operations shall be performed only during the periods March 1 to June 30 and August 1 to December 1.
- F. Do not sow immediately following rain, when ground is too dry or frozen, or during windy periods.
- G. Apply water with fine spray immediately after each area has been sown.

3.05 HYDROSEEDING

- A. Apply seeded slurry with a hydraulic seeder, only when specifically stated in the Section 01 10 00 – Special Provisions, evenly in 2 intersecting directions at a rate of 1,500 pounds of mulch/acre.

3.06 MULCHING

- A. This work shall consist of placing a mulch on areas seeded. The mulch shall be loose enough to allow sunlight to penetrate and air to slowly circulate, but thick enough to shade the ground, reduce rate of water evaporation and prevent or reduce water or wind erosion.
- B. Mulch shall be either dry cured native hay or threshed grain straw. Hay or straw shall be free from seeds of noxious weeds and relatively free from seeds of all other weeds.
- C. The mulch shall be applied at the rate of 2 tons per acre.
- D. Mulch shall be immediately applied after sowing the seed unless otherwise directed by Engineer. The mulch shall be applied with a mulch blowing machine or other approved methods.
- E. Immediately following the spreading of the mulch, the material shall be anchored to the soil by a V-type wheel land packer, a soil erosion mulch tiller or other suitable equipment which will secure the mulch firmly to form a soil-binding mulch.
- F. Apply water with a fine spray immediately after each area has been mulched.

3.07 RESEEDING

- A. Prior to the expiration of the 1-year warranty, Contractor will be required to reseed any area that has not established a vigorous growth of specified seed mixture. Engineer to determine which areas are to be reseeded.

END OF SECTION

SECTION 33 31 00
SANITARY SEWER PIPING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Sanitary sewer collection piping, fittings and accessories.
- B. Sanitary sewer force main.
- C. Sanitary sewer service.
- D. Furnishing of material, labor and installation.
- E. Testing of sanitary sewer lines.
- F. Cleaning of sanitary sewer lines.

1.02 REFERENCES

- A. ANSI/AWWA C 104 – Cement – Mortar Lining for Ductile – Iron Pipe and Fittings for Water.
- B. ANSI/AWWA C 105 – Polyethylene encasement for Ductile – Iron Pipe Systems.
- C. ANSI/AWWA C 110 – Ductile – Iron and Gray – Iron Fittings, for Water.
- D. ANSI/AWWA C 111 – Rubber – Gasket Joints for Ductile – Iron Pressure Pipe and Fittings.
- E. ANSI/AWWA C 150 – Thickness Design of Ductile – Iron Pipe.
- F. ANSI/AWWA C 151 – Ductile – Iron Pipe, Centrifugally Cast, for Water.
- G. ANSI/AWWA C 153 – Ductile – Iron Compact Fittings, for Water Service.
- H. ANSI/AWWA C 512 – Air Release, Air/Valve and Combination Air Valves for Water Work Service.
- I. ANSI/AWWA C 600 – Installation of Ductile – Iron Water Mains and Their Appurtenances.
- J. ANSI/AWWA C 605 – Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water.
- K. ANSI/AWWA C 900 – Polyvinyl Chloride (PVC) Pressure Pipe, 4 inch through 12 inch for Water.
- L. ANSI/AWWA C 905 – Polyvinyl Chloride (PVC) for Pressure Pipe, 14 inch through 48 inch for Water for Water Transmission and Distribution.
- M. ANSI/AWWA C 906 – Polyethylene (PE) Pressure Pipe and Fittings, 4 inch through 63 inch for Water Distribution and Transmission.
- N. ANSI/AWWA C 909 – Molecularly Oriented Polyvinyl Chloride (PVCO) Pressure Pipe, 4 inch through 24 inch for Water Distribution.
- O. ASTM A 53 – Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
- P. ASTM A 139 – Standard Specification for Electric-Fusion (Arc)-Welded Steel Pipe (NPS 4 and Over).

- Q. ASTM A 746 – Standard Specification for Ductile Iron Gravity Sewer Pipe.
- R. ASTM C 12 – Standard Practice for Installing Vitrified Clay Pipe Lines.
- S. ASTM C 425 – Standard Specification for Compression Joints for Vitrified Clay Pipe and Fittings.
- T. ASTM D 698 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³))
- U. ASTM C 700 – Standard Specification for Vitrified Clay Pipe, Extra Strength, Standard Strength, and Perforated.
- V. ASTM C 1173 - Standard Specification for Flexible Transition Couplings for Underground Piping Systems
- W. ASTM D 1784 – Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds.
- X. ASTM D 1556 – Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method.
- Y. ASTM D 1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)).
- Z. ASTM D 1785 – Standard Specification for Poly(Vinyl Chloride)(PVC) Plastic Pipe, Schedules 40, 80, and 120.
- AA. ASTM D 2167 – Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
- BB. ASTM D 2321 – Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.
- CC. ASTM D 2680 – Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) and Poly(Vinyl Chloride) (PVC) Composite Sewer Piping.
- DD. ASTM D 2729 – Standard Specification for Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
- EE. ASTM D 6938 – Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
- FF. ASTM D 3034 – Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
- GG. ASTM D 3035 – Standard Specification for Polyethylene (PE) Plastic Pipe (DR_PR) Based on Controlled Outside Diameter.
- HH. ASTM D 3212 – Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.
- II. ASTM D 3261 – Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.
- JJ. ASTM D 6938 – Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

- KK. ASTM F 477 – Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
- LL. ASTM F 679 – Standard Specification for Poly (Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings.
- MM. ASTM F 1336 – Standard Specification for Poly (Vinyl Chloride) (PVC) Gasketed Sewer Fittings.
- NN. ASTM F 1417 – Standard Practice for Installation Acceptance of Plastic Non-Pressure Sewer Lines Using Low-Pressure Air.
- OO. ASTM F 1962 – Standard Guide for Use of Maxi-Horizontal Directional Drilling for Placement of Polyethylene Pipe or Conduit Under Obstacles, Including River Crossings.
- PP. ASTM F 2164 - Standard Practice for Field Leak Testing of Polyethylene (PE) and Crosslinked Polyethylene (PEX) Pressure Piping Systems Using Hydrostatic Pressure
- QQ. ASTM F 2206 - Standard Specification for Fabricated Fittings of Butt-Fused Polyethylene (PE).
- RR. ASTM F 2620 - Standard Practice for Heat Fusion Joining of Polyethylene Pipe and Fittings
- SS. ASTM F 3154 - Standard Practice for Data Recording the Procedure used to Produce Heat Butt Fusion Joints in Plastic Piping Systems or Fittings.
- TT. ASTM F 3190 - Standard Practice for Heat Fusion Equipment (HFE) Operator Qualification on Polyethylene (PE) and Polyamide (PA) Pipe and Fittings.
- UU. UNI-B-06 – Uni-Bell PVC Pipe Association, Recommended Low-Pressure Air Testing of Installed Sewer Pipe
- VV. AASHTO T 180 – Standard Method of Test for Moisture Density Relations of Soils Using 10-lb Rammer and an 18-in Drop
- WW. Recommended Standards for Water Works, latest edition (aka 10 States Standards) by Great Lakes – Upper Mississippi River Board of State Public Health and Environmental Managers.

1.03 UNIT PRICES

- A. Pipe:
 - 1. Method of Measurement:
 - a. Measured along centerline of pipe, to the nearest foot.
 - b. No deduction for manhole or fitting installed in the line.
 - 2. Pay Unit: By the linear foot (LF) for each respective size and type of pipe.
 - 3. Includes excavation, hand trimming excavation, pipe, trace wire and test stations, thrust restraint rods and eye bolts, concrete thrust restraints, placement, assembly, bedding, backfilling and compaction of backfill, testing and incidentals thereto.

- a. Testing includes:
 - (1) Deflection testing of flexible gravity sewer main pipe (PVC, PE, Etc.) using rigid ball or mandrel.
 - (2) Leakage testing, by low pressure air, of gravity sewer main pipe.
 - (3) Televised inspection of gravity sewer main pipe.
 - (4) Hydrostatic testing of pressure sewer pipe (Force Main Pipe).
 - (5) Alignment testing of gravity sewer main pipe.
 - (6) Compacted density testing of backfill.
 - (7) Concrete Compressive Strength Testing
 - (8) Trace Wire Testing
- B. Fittings:
 - 1. Method of Measurement and Pay Unit: By the unit (Each) for each respective size and type of fitting.
 - 2. Includes excavation, hand trimming excavation, fitting, polyethylene encasement, thrust restraint rods and eye bolts, concrete thrust restraints, placement, assembly, bedding, backfilling and compaction of backfill, testing and incidentals thereto.
- C. Retainer Gland:
 - 1. Method of Measurement and Pay Unit: By the unit (Each) for each respective size and type of Retainer Gland.
 - 2. Includes Retainer Gland placement, assembly, testing and incidentals thereto.
- D. Special Pipe Fittings:
 - 1. Method of Measurement and Pay Unit: By the unit (Each) for each respective size and type.
 - 2. Includes excavation, hand trimming excavation, fitting, placement, assembly, bedding, backfilling and compaction of backfill, connection to pipe, testing and incidentals thereto.
- E. Service Wye or Saddle:
 - 1. Method of Measurement and Pay Unit: By the unit (Each) for each respective size and type.
 - 2. Includes excavation, hand trimming excavation, wye or saddle, placement, assembly, bedding, backfilling and compaction of backfill, connection to pipe, testing and incidentals thereto.
- F. Dry Boring and Jacking of Casing Pipe:
 - 1. Method of Measurement: Measured along centerline of casing pipe, within the extents of the casing pipe shown in the Drawings. The length of the casing pipe considered for payment shall not be greater than the length shown in the

Drawings, unless the length of the casing pipe is increased at the direction of Engineer.

2. Pay Unit: By the linear foot (LF) for each respective size and type of casing pipe bored and jacked within the limits shown in the Drawings or as directed by Engineer.
3. Includes excavation of jacking pits, dry bore hole for casing pipe, removal of bored materials, jacking equipment, casing pipe and installation, chocks, installation of carrier pipe in casing pipe, casing end seal, backfilling and compaction of backfill, connection to pipe, testing and incidentals thereto.
4. Carrier Pipe: Installed within casing pipe, shall be measured and paid for separately.

G. Dry Boring Without Casing Pipe:

1. Method of Measurement: Measured along centerline of Dry Bore, within the extents of the dry bore shown in the Drawings. The length of the dry bore considered for payment shall not be greater than the length shown in the Drawings, unless the length of the dry bore is increased at the direction of Engineer.
2. Pay Unit: By the linear foot (LF) for each respective size of pipe installed by dry boring.
3. Includes excavation of boring pits, dry bore hole for pipe, removal of bored material, jacking equipment, installation of carrier pipe in bore hole, backfilling and compaction of backfill, connection to pipe, testing and incidentals thereto.
4. Carrier Pipe: Installed within dry bore, shall be measured and paid for separately.

H. Directional Boring Carrier Pipe:

1. Method of Measurement: Measured along centerline of directional boring, within the extents of the directional boring shown in the Drawings. Horizontal stationing along the centerline of alignments is based upon level line measurement and is used for measurement and payment. Actual pipe length is determined by the slope or curve on which the pipe is installed. No additional payment shall be made for variations in actual pipe length due to installation on slopes or curves.
2. The length of the directional boring considered for payment shall not be greater than the length shown in the Drawings, unless the length of the directional boring is increased at the direction of Engineer.
3. Pay Unit: By the linear foot (LF) for each respective size of pipe installed by directional boring.
4. Includes excavation, directional bore hole for pipe, trace wire and test stations, jacking equipment, carrier pipe and installation of carrier pipe, backfilling and compaction of backfill, connection to pipe, testing and incidentals thereto.
5. Carrier pipe will not be measured and paid for separately, but will be considered a subsidiary item included in the directional boring pay item.

- I. Wet boring is not approved for this project.
- J. Dewatering of Trench:
 - 1. Dewatering, including intercepting and diverting site drainage and surface water flows away from excavations and trenches, and removing standing water from trench or excavation with a sump and pump shall be considered incidental and subsidiary to other items of work for which direct payment is made
 - a. Includes providing all permits required for the dewatering and paying all permit costs, pump, piping, wells and/or well points, dewatering equipment, assembly and disassembly, backfilling and compaction of backfill, energy cost and incidentals thereto.
 - 2. Method of Measurement: (INCIDENTAL)
 - a. Unless otherwise specified in Section 01 10 00 – Special Provisions, measurement and separate payment for dewatering will not be made.
- K. Polyethylene Encasement:
 - 1. Polyethylene encasement of ductile or gray iron pipe and fitting is considered to be subsidiary to and included in the cost of the ductile iron, gray iron or other item for which payment is made.
- L. Connection to Existing Sewer Main or Manhole:
 - 1. Method of Measurement and Pay Unit: By the unit (Each).
 - 2. Includes excavation, hand trimming excavation, bedding, backfilling and compaction of backfill, adapters, fittings, thrust restraints, couplings, coring the wall of the structure, sleeves, gaskets and incidentals thereto.
- M. Connection to Existing Sewer Service:
 - 1. Method of Measurement and Pay Unit: By the unit (Each).
 - 2. Includes excavation, hand trimming excavation, bedding, backfilling and compaction of backfill, adapters, fittings, couplings, sleeves, gaskets and incidentals thereto.
- N. Abandon Existing Sewer Main:
 - 1. Method of Measurement and Pay Unit: By the unit (Each).
 - 2. Includes excavation, hand trimming excavation, capping or plugging the existing main, concrete, fittings, backfilling and compaction of backfill, adapters, fittings, couplings, sleeves, gaskets and incidentals thereto.
- O. Abandon Existing Sewer Service:
 - 1. Method of Measurement and Pay Unit: By the unit (Each).
 - 2. Includes excavation, hand trimming excavation, capping or plugging the existing service line, concrete, fittings, backfilling and compaction of backfill, adapters, fittings, couplings, sleeves, gaskets and incidentals thereto.
- P. Bedding:
 - 1. Considered to be a subsidiary item included in the cost of the item for which payment is made.

- Q. Flexible Coupling:
1. Considered to be a subsidiary item included in the cost of the item for which payment is made.
- R. Adapter:
1. Adapters for transition from one type of material to another are considered a subsidiary item included in the cost of the item for which payment is made.
- S. Testing and Cleaning:
1. Considered to be a subsidiary item included in the cost of the item for which payment is made.
- T. Thrust Restraint:
1. Thrust restraint rods and eye bolts and concrete thrust restraints are considered to be a subsidiary item included in the cost of the item for which payment is made.
- U. Trace Wire, Trace Wire Terminal Access Box, Marker Post and Appurtenances:
1. Trace wire, trace wire test stations, trace wire terminal access boxes, marker posts with test station, mounting stakes, decals and installation and testing are considered to be subsidiary items to and included in the cost of the item for which payment is made.
- V. TV Inspection:
1. Considered to be a subsidiary item included in the cost of the item for which payment is made.

1.04 DEFINITIONS

- A. Bedding: Fill placed under, beside and directly over pipe prior to subsequent backfill operations, as shown in the Drawings.

1.05 SUBMITTALS

- A. Product Data: Provide data on pipe materials, pipe fittings, service line materials, and accessories and appurtenances.
- B. Bedding: Provide data on proposed bedding material.
- C. Concrete: Provide concrete design mix data.
- D. Manufacturer's Installation Instructions: Provide special procedures required to install products.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- F. Project Record Documents:
1. Record location of pipe runs, connections, manholes, cleanouts, pipe fittings and invert elevations.
 - a. Provide Engineer with a minimum of 3 distance ties from the center of manhole cover, clean out cover and pipe fittings to permanent topographical feature (trees, buildings, fire hydrants, etc.).

- b. Provide Engineer with GPS Coordinates, if required, see Section 01 10 00 – Special Provisions.
 - c. Provide Engineer with distance to service wyes or saddle from center of manhole.
 - d. For directional bore, submit to Engineer the plot of the actual horizontal and vertical alignment of the pilot bore at intervals not to exceed 30 feet.
- 2. Identify, describe and record the discovery of variations in subsoil conditions, and provide copy of record to Engineer.
- 3. Identify, describe and record the discovery of uncharted utilities, and provide copy of record to Engineer.
- 4. Testing:
 - a. Low Pressure Air Test of Gravity Flow Sewer Pipe, provide copy of Test Records to Engineer.
 - b. Hydrostatic Test of Pressure Sewer Pipe, provide copy of Test Records to Engineer.
 - c. Alignment and Deflection Test of Gravity Flow Sewer Pipe, provide copy of Test Records to Engineer.
 - d. Televising of Gravity Flow Sewer Pipe, provide copy of Records of Televising to Engineer.
 - e. HDPE Fusion Reports; provide copy of Reports to Engineer
 - f. Trace Wire Continuity Testing; provide copy of Test Records to Engineer.
 - g. Backfill Compaction Testing; provide copy of Test Records to Engineer, see Section 01 10 00 – Special Provisions.
 - h. Concrete Strength Test Records; provide copy of Test Records to Engineer, see Section 01 10 00 – Special Provisions.
- 5. Submit the following for restrained joint ductile iron pipe:
 - a. Restrained joint style and detailed designs by the pipe manufacturer, including detailed laying schedules.

1.06 QUALITY ASSURANCE

- A. Pipe: Nominal pipe size, material code designation, standard dimension ratio, pressure rating, manufacturer's name or trademark and appropriate AWWA or ASTM designation numbers marked on pipe.
- B. Fittings: Manufacturer's name and pressure rating marked on body.

1.07 REGULATORY REQUIREMENTS

- A. Conform to all applicable local, state and federal code for materials and installation of the work of this section. Perform work in accordance with standards of authorities having jurisdiction for sanitary sewer piping. Includes materials, installation and testing.

1.08 PROJECT CONDITIONS

- A. Verify that survey control points for alignment and elevation are as shown in the Drawings.
- B. Research public utility records and verify location of existing utilities.
 - 1. Contact utility locating service for project area.
 - 2. Comply with applicable "ONE CALL" requirements.
- C. Provide exploratory excavation to determine exact location of existing underground structures or utilities. Notify Engineer immediately if a discrepancy or conflict is identified.
- D. Verify that sanitary sewer piping and appurtenances can be installed as shown in the Drawings and to reference standards.
- E. Protect plants, lawns, trees, and other amenities and features; which are to remain, as shown in the Drawings or specified in Section 01 10 00 – Special Provisions, from damage by equipment, vehicular traffic and other construction related activities.
- F. Verify that sewer service piping can be installed as shown in the Drawings and to reference standards.
- G. Protect benchmarks, survey control points, existing structures, fences, sidewalks, paving, curbs, utility pedestals and lines and amenities that are to remain from damage by excavating equipment, vehicular traffic and other construction related activities.
- H. Coordinate the connection of sanitary sewer piping to existing sewer main, sewer service line and/or other sewer facilities as shown in the Drawings.

1.09 DELIVERY, STORAGE AND HANDLING

- A. Preparation for Transport:
 - 1. Do not telescope small diameter pipe inside larger diameter pipe.
 - 2. Protect fittings, glands, gaskets, threaded ends, flange faces, castings, manholes and specialties.
- B. During Storage:
 - 1. Do not remove end protectors unless necessary for inspection; then reinstall for storage.
 - 2. Protect from weather:
 - a. Protect stored pipe, fittings, castings, manholes and specialties from moisture and dirt.
 - b. When outdoor storage is necessary, support materials off the ground or pavement.
 - 3. Protect PVC pipe from prolonged (more than 1 month) exposure to sunlight.
 - 4. Support flexible pipe to prevent sagging and bending.

- C. Handling:
 - 1. Use sling to lift pipe, fittings, castings, manholes and specialties where size requires handling by crane or other equipment.
 - a. Rig pipe, fittings, castings, manholes and specialties to protect and avoid damage during handling.
 - 2. Deliver pipe, fittings, castings, manholes and specialties to trench in sound, undamaged condition.

1.10 SEQUENCING/SCHEDULING

- A. Attend preconstruction meeting.
- B. Submit plan for construction sequence prior to commencing work.
- C. Coordinate the connection of sanitary sewer piping to existing sewer main, sewer service line and/or other sewer system facilities, as shown in the Drawings, with Owner and Engineer.
 - 1. Give Owner and Engineer a minimum 24-hours' notice before connection to existing main or other sewer system facilities.
 - 2. Keep disruption of service less than 4 hours.
- D. Give Engineer, Owner and permitting authority a minimum 48-hours notice prior to commencing any boring activity.

PART 2 - PRODUCTS

2.01 APPROVED MANUFACTURERS/PRODUCTS

- A. All products furnished shall meet all applicable ASTM and AWWA requirements.
- B. See Section 01 10 00 – Special Provisions for specific product brand requirements.

2.02 GRAVITY SEWER PIPE

- A. Poly (Vinyl Chloride) (PVC) Solid Wall Pipe:
 - 1. General:
 - a. Diameter: As shown in the Drawings.
 - b. Conform to ASTM D 3034, or ASTM D 1784 or ASTM F 679, as applicable.
 - c. Cell Classification: 12454-B.
 - 2. Pipe Class:
 - a. 8 inch to 15 inch diameter inclusive, ASTM D 3034, SDR 35.
 - b. 18 inch to 27 inch diameter inclusive, ASTM F 679.
 - 3. Color: Green or White for Sewer purposes.
 - 4. Joints: Bell and spigot type with rubber gasket, ASTM D 3212 and ASTM F 477.
 - 5. Fittings: Same material as pipe, molded or formed to suit pipe size and joint design.

- B. Poly(Vinyl Chloride) (PVC) Composite Truss Pipe:
1. General:
 - a. Diameter: As shown in the Drawings.
 - b. Conform to ASTM D 2680.
 - c. Semirigid pipe.
 2. Color: Green or White for Sewer purposes.
 3. Joints: Bell and spigot type with rubber gasket, ASTM D 3212.
 4. Fittings: Gasketed fittings for PVC composite truss pipe, molded or formed to suit pipe size and joint design.
- C. Vitrified Clay Pipe and Fittings:
1. General:
 - a. Diameter: As shown in the Drawings.
 - b. Conform to ASTM C 700 for Vitrified Clay Pipe (VIP) and fittings, integrally cast bell and spigot type, conforming to extra strength provisions.
 - c. Vitrified clay pipe bell and spigot joints shall conform to ASTM C 425 for compression joint.
 - d. Fittings: Vitrified Clay, molded or formed to suit pipe size and joint design.
- D. Ductile Iron Pipe (DIP):
1. Conform to ANSI/AWWA C151.
 2. Diameter: As shown in the Drawings.
 3. Thickness/Rating:
 - a. 3" – 12": Pressure Class 350, minimum.
 - b. 14" – 48": Pressure Class 250, minimum.
 4. Joints: ANSI/AWWA C111, rubber gasket, push-on or mechanical joint.
 - a. Restrained Joint DIP:
 - (1) Flexible type.
 - (2) Boltless, lock ring type.
 - (3) Restraining gaskets are not approved.
 - (4) Fittings: Ductile iron molded or formed to suit pipe size and joint design.
 5. Exterior Coating: Asphaltic, 1 mil thickness, per ANSI/AWWA C104.
 6. Interior Coating: Standard cement lining with seal coat, per ANSI/AWWA C104.
 7. Buried DIP shall be encased in Polyethylene per ANSI/AWWA C105.

- E. High Density Polyethylene (HDPE) Pipe:
1. AWWA C906: PE 3408 or PE 4710.
 2. DR: As shown on the Bid form and/or shown in the Drawings or specified in Section 01 10 00 – Special Provisions.
 3. Manufactured with color striping to identify their application.
 - a. Green for Sewer purposes.
 4. Same outside diameter size as ductile iron.
 5. Furnish manufacturer's inspection certificates.
 6. Polyethylene pipe may be joined together by butt fusion using approved heat-fusion joining machine in accordance with ASTM F 2620.
 7. Polyethylene pipe may be joined to other materials by means of:
 - a. Flanged connections (flange adapters and back-up rings). Flange adapters shall be fitted with back-up rings that are pressure rated equal to or greater than the mating pipe. The back-up ring bore shall be chamfered or radiused to provide clearance to the flange adapter radius.
 - b. Mechanical Joint Adapters.
 - c. Mechanical couplings designed for joining polyethylene pipe to another material.
 8. A stainless steel stiffener shall be installed in the bore of the polyethylene pipe when an OD compression mechanical coupling is used and when connecting plain end PE pipe to a mechanical joint pipe, fitting or appurtenance.
 9. External clamp and tie rod restraint shall be installed where PE pipe is connected to the socket of a mechanical joint pipe, fitting or appurtenance except where a Mechanical Joint Adapter is used.
 10. High density polyethylene (HDPE) molded fittings are not approved.

2.03 PRESSURE SEWER PIPE (FORCE MAINS)

- A. Polyvinyl Chloride (PVC) Pipe and Molecularly Oriented Polyvinyl Chloride (PVOC):
1. General:
 - a. AWWA C900, 4 inch through 12 inch; AWWA C905, 14 inch through 36 inch, AWWA C909, 4 inch through 24 inch.
 - b. DR or Pressure Class: As shown on the Bid form and/or shown in the Drawings or specified in Section 01 10 00 – Special Provisions.
 - c. Color: Green or White for Sewer purposes.
 - d. Same outside diameter as ductile iron pipe.
 2. Joints:
 - a. Conform to AWWA C900 or AWWA C905 or AWWA C909 as applicable to pipe.

- b. Elastomeric gasketed push-on joints.
 - c. Solvent cement welded joints are not approved.
 - 3. Fittings: Mechanical Joint Ductile Iron - Gray Iron
 - B. Ductile Iron Pipe (DIP):
 - 1. Refer to Paragraph 2.02 D of this Section.
 - C. Restrained Joint PVC Pipe:
 - 1. General:
 - a. AWWA C900, for 4 inch through 12 inch.
 - b. Restrained joint pipe shall be furnished in 4", 6", 8", 10", 12" sizes in DR or Pressure Class, as shown on the Bid form and/or shown in the Drawings or specified in Section 01 10 00 – Special Provisions.
 - c. The restrained joint pipe system shall meet all short and long term pressure test requirements of AWWA C900.
 - d. Pipe joints shall be designed for use at or above the pressure class of the pipe with which they are utilized.
 - 2. Materials:
 - a. The products represented by this specification are made from unplasticized PVC compounds having a minimum cell classification of 12454 as defined in ASTM D 1784.
 - b. Gasket shall be elastomeric sealing gaskets meeting the requirements of ASTM F 477.
 - c. Pipe joints shall be designed for use at or above the pressure class of the pipe with which they are utilized.
 - d. Joints shall be designed to meet the zero leakage test requirements of ASTM D 3139.
 - 3. Dimensions & Color:
 - a. Nominal outside diameters and wall thicknesses of this restrained joint pipe conforming to the requirements of AWWA C900 (Cast Iron pipe OD).
 - b. Pipe shall be furnished in standard lengths of 20 feet.
 - c. Color: Green or White for Sewer purposes.
 - 4. Workmanship:
 - a. Pipe and couplings (as applicable) shall be homogeneous throughout and free from voids, cracks, inclusions and other defects and shall be as uniform as commercially practicable in color, density and other physical characteristics.

5. Marking:

- a. Pipe and couplings (as applicable) are legibly and permanently marked in ink with critical information including nominal size, material type, dimension ratio, pressure class, applicable standards, manufacturer's name or trademark, production record code and seal (mark) of testing agency verifying the suitability of the pipe material for potable water systems.

D. High Density Polyethylene (HDPE) Pipe:

1. General:

- a. PE 3408 or PE 4710.
- b. DR: As shown on the Bid form and/or shown in the Drawings or specified in Section 01 10 00 – Special Provisions.
- c. Manufactured with color striping to identify their application. Green for sewer purposes.
- d. Same outside diameter size as ductile iron.
- e. Furnish manufacturer's inspection certificates.
- f. Polyethylene pipe may be joined together by butt fusion using approved heat-fusion joining machine in accordance with ASTM F 2620.

2. Polyethylene pipe may be joined to other materials with fittings with the same or greater pressure rating by means of:

a. Flanged adapters:

- (1) Shall be manufactured from PE4710 material.
- (2) Fitted with back-up rings that are pressure rated equal to or greater than the mating pipe.
- (3) The back-up ring bore shall be chamfered or radiused to provide clearance to the flange adapter radius.
- (4) Shall meet the requirements of ASTM D3261 for molded butt fusion fittings and mechanical joint adapters or shall comply with AWWA C906 for fabricated butt fusion fittings.
- (5) Shall meet the marking requirements of ASTM D3261 for molded butt fusion fittings and mechanical joint adapters or shall comply with the marking requirements of AWWA C906 for fabricated butt fusion fittings.

3. Where shown on the drawings, 4" and larger transitions to mechanical joint fittings and valves shall be accomplished using a MJ Adapter kit:

- a. Molded or Fabricated HDPE mechanical joint transition fitting.
- b. Gasket.
- c. Mechanical joint backup drive ring.

- d. Stainless Steel tee bolts.
- 4. Mechanical Joint Adapters:
 - a. Mechanical couplings designed for joining polyethylene pipe to another material and AWWA C111 joints.
 - b. A stainless steel stiffener shall be installed in the bore of the polyethylene pipe when an OD compression mechanical coupling is used and when connecting plain end PE pipe to a mechanical joint pipe, fitting or appurtenance.
 - c. External clamp and tie rod restraint shall be installed where PE pipe is connected to the socket of a mechanical joint pipe, fitting or appurtenance except where a Mechanical Joint Adapter is used.
- 5. High density polyethylene (HDPE) molded fittings are not approved.
- E. Pressure Sewer Pipe Restraint:
 - 1. Mechanical Restraint and Concrete Thrust Block at bends, tees and dead ends against undisturbed soil.
 - 2. Location and Size: As shown in the Drawings.

2.04 FITTINGS

- A. Conform to ANSI/AWWA C110 or ANSI/AWWA C153
- B. Diameter: 2 inch through 64 inch as shown in the Drawings.
- C. Material: Ductile Iron
- D. Mechanical Joints: Conform to ANSI/AWWA C111.
- E. Gaskets: Conform to ANSI/AWWA C111.
- F. Exterior Coating: Asphaltic, 1 mil thickness.
- G. Interior Coating: Standard cement lining ANSI/AWWA C104 with seal coat.
- H. Working Pressure: 350 psi.
- I. Buried fittings shall be encased in Polyethylene per ANSI/AWWA C105.

2.05 SHIELDED FLEXIBLE COUPLINGS

- A. Watertight flexible coupling shall provide connection of gravity sewer pipes of same or different materials.
- B. Coupling shall meet ASTM C 1173 with maximum test pressure of 4.3 psi.
- C. Gasket shall have minimum tensile strength of 1,000 psi and minimum tear strength of 150 lbs/in.
- D. Shall include a stainless steel shear ring, minimum 0.012" thick, width according to coupling diameter.
- E. Watertight flexible coupling shall provide positive seal against infiltration and exfiltration.
- F. Watertight flexible coupling shall be leakproof, root proof and be resistant to chemicals, ultraviolet rays, fungus growth, and normal sewer gases.

- G. Stainless steel clamps shall corrosion-resistant and rustproof.

2.06 FLEXIBLE COUPLINGS

- A. Install at locations as shown in the Drawings.
- B. Ductile Iron Couplings/Flexible Couplings:
 - 1. Ductile iron body.
 - 2. Finish: Epoxy coated per AWWA C213 or equal.
 - 3. Gaskets: Rubber, Buna-N or equal.
 - 4. Working Pressure: 150 psi.

2.07 POLYETHYLENE ENCASEMENT FOR IRON PIPE AND FITTINGS

- A. Shall meet ANSI/AWWA C105 standards.
- B. Flat sheet, split tube or tube.
- C. 8 mil (0.20 mm) thickness.

2.08 NUTS AND BOLTS, EYE BOLTS AND THREADED ROD THRUST RESTRAINTS

- A. Nuts and Bolts: Ductile iron, corten or stainless steel.
- B. Eye Bolts: 3/4 inch diameter, corten.
- C. Threaded Rod: 3/4 inch diameter; stainless steel or corten.
- D. Wrapped with polyethylene encasement AWWA C105.

2.09 CONCRETE THRUST BLOCKS

- A. As shown in the Drawings.
- B. Concrete Mix Design: Compressive strength when tested in accordance with ASTM C 39 at 28 Days: Minimum 3,500 psi.

2.10 TRACE WIRE

- A. General:
 - 1. Trace wire shall be installed with pipe when shown in the Drawings or specified in Section 01 10 00 – Special Provisions.
 - 2. Wire Size: Minimum size shall be 12 AWG or as shown in the Drawings or specified in Section 01 10 00 – Special Provisions.
 - 3. Jacket color shall meet the APWA color code standard for identification of buried utilities, green for sewer.
 - 4. Jacket/ coating type shall be High Density Polyethylene (HDPE) or High Molecular Weight Polyethylene (HMWPE) rated for direct burial. Nylon is not allowed.
- B. Placement:
 - 1. The tracer wire shall be placed in the same orientation as installed pipe.
 - 2. The tracer wire shall be placed as shown in the Drawings or specified in Section 01 10 00 – Special Provisions.

- C. Wire Type:
 - 1. Open trench/direct bury: Wire type shall be Solid Copper or Solid Copper Clad Steel (CCS) or as shown in the Drawings or specified in Section 01 10 00 – Special Provisions.
 - 2. Pipe bursting and directional boring: Wire type shall be Solid Copper Clad Steel (CCS) or as shown in the Drawings or specified in Section 01 10 00 – Special Provisions.
 - 3. Stranded wire not required, but may be used at Contractor's option.
- D. Connectors (splice):
 - 1. Shall be Copperhead SnakeBite connector, 3M DBR connector or approved equal and shall be rated for direct bury for the protection of wire from moisture and corrosion.
 - 2. Connector shall be sized appropriate to the number and size of wires connected.
- E. Test Stations:
 - 1. General:
 - a. Test stations shall be installed to bring the tracer wire to level for ease of testing.
 - 2. Flush Mount Terminal Access Box:
 - a. Tracer wire shall be terminated at each end in a flush mount terminal access box.
 - b. Terminal access box shall have a cast iron lid that can be locked and opened with a standard pentagon head key wrench.
 - c. Riser base: 12" minimum depth, PVC or approved equivalent.
 - d. Terminal access box shall be installed in a concrete pad, set to finish grade, as shown in the Drawings or specified in Section 01 10 00 – Special Provisions.
 - e. Tracer wires shall be attached to integral stainless steel screws.
 - f. Terminals shall be readily accessible once the lid is removed for use of a locator.
 - g. Extend tracer wire up inside terminal access box, leaving minimum of 3 feet of tracer wire inside terminal access box.
 - h. Tracer wire terminal access box shall be located, as shown in the Drawings or specified in Section 01 10 00 – Special Provisions.
 - 3. Sewer line marker post and tracer wire test station:
 - a. Six (6) foot minimum length.
 - b. Shall be designed to bend and rebound when struck by a vehicle.
 - c. Shall be triangular shape or approved equal.

- d. Color shall meet the APWA color code standard for identification of buried utilities, green for sewer.
- e. Shall have decals stating "Warning, Buried Sewer" or similar.
- f. Shall have minimum of two corrosion resistant internal terminals, brass or stainless steel.
- g. Shall have removable top cap to access internal terminals.
- h. Installation of trace wire in marker post and test station:
 - (1) Bury the bottom 18 inches of the marker post and test station, with anchor barbs flared out.
 - (2) Run the trace wire up through the marker post and test station, leaving a minimum of 3 feet of tracer wire slack inside the marker post and test station.
 - (3) Each tracer wire shall be attached to an internal corrosion resistant terminal.
 - (4) Label the screws with a permanent marker to indicate the direction of the main and trace wire from the marker post and test station. IE; "Trace Line North", "Trace Line South", Etc.
- i. Marker post and test station shall be located as shown in the Drawings or specified in Section 01 10 00 – Special Provisions.

2.11 SERVICES

- A. General:
 - 1. Nominal Inside Diameter: 4 inches or as shown in the Drawings.
 - 2. Service Wyes shall be same material as main line pipe and shall have the same type of gasketed connections.
- B. Poly(Vinyl Chloride) (PVC) Sewer Service Pipe:
 - 1. PVC - SDR 26 or Schedule 40. See bid form, Section 01 10 00 – Special Provisions and Drawings.
 - 2. Joints: Bell and spigot type with rubber gasket, ASTM D 3212 and ASTM F 477.
 - 3. Service Wye and Bends:
 - a. PVC, molded or formed to suit pipe size and joint design.
 - b. Compatible with main line sewer material.
 - c. Watertight Joints:
 - (1) Bell and spigot type.
 - (2) Rubber gasket ASTM D 3212, ASTM F 477 and ASTM F 1336.
- C. Vitrified Clay Pipe and Fittings:
 - 1. General:
 - a. Nominal Inside Diameter: 4 inches or as shown in the Drawings.

- b. Conform to ASTM C700 for Vitrified Clay Pipe (VCP) and fittings, integrally cast bell and spigot type, conforming to extra strength provisions.
 - c. Vitrified clay pipe bell and spigot joints shall conform to ASTM C 425 for compression joint.
 - d. Fittings: Vitrified Clay, molded or formed to suit pipe size and joint design.
- D. Saddles with watertight, rubber gasket joints and stainless steel bands.

2.12 CASING PIPE

- A. Steel Pipe:
 - 1. General: Uncoated, smooth wall welded steel pipe; ASTM A 53, Type E or Type S, Grade B black steel; or ASTM A 139, Grade B black steel. Minimum yield strength 35,000 psi.
 - 2. Minimum Wall Thickness: See Drawings and Section 01 10 00 – Special Provisions.
- B. Casing Chocks:
 - 1. General: Provide casing chocks for carrier pipe 4 inches or greater in diameter.
 - 2. High Density Polyethylene
 - 3. Shall have runners that extend beyond the bell, mechanical joint, or restrainer of the carrier pipe.
 - 4. Shall be designed to grip tightly to the carrier pipe
- C. Casing End Seals: Minimum 1/8" thick synthetic rubber end seals with stainless steel bands:
 - 1. After insertion of the carrier pipe into the casing, the ends of the casing shall be closed by installing wrap-around end seals or equal.
 - 2. Place the end seal around the carrier pipe and casing; then compress the adhesive strips to form a seal.
 - 3. Stainless steel banding installed and tightened per manufacture's recommendation.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that trench excavation is ready to receive work and excavation dimensions and elevations are as shown in the Drawings.
- B. Verify that building service connection and utility sanitary service line size, location and invert are as indicated.
- C. Verify depth and location of other buried utilities and structures in the area.

3.02 TRENCHING

- A. See Section 31 23 33 – Trenching for Utilities and Drawings for additional requirements.

- B. Hand trim excavation for accurate placement of pipe and fittings to elevations and alignment shown.
- C. Place and compact embedment materials for bedding, haunching and initial backfill according to manufacturer's recommendations.
- D. Place and compact embedment materials for bedding, haunching and initial backfill according to ASTM D 2321 for plastic pipe.
- E. Backfill around sides and to top of pipe with cover fill, tamp in place and compact; then complete backfilling.
- F. Protect pipe from damage and displacement while backfilling and compacting.

3.03 PIPE AND FITTING INSTALLATION

- A. Install pressure pipe and appurtenances in accordance with manufacturer's recommendations and applicable AWWA standards, including but not limited to proper handling and storage, installation, and testing of pipe.
 - 1. Form and place concrete for pressure sewer pipe thrust restraints at each change in pipe direction. Place concrete to permit full access to pipe and pipe accessories. See Drawings for square footage of thrust restraint based on pipe diameter.
- B. Installation of gravity pipe and appurtenances:
 - 1. In accordance with manufacturer's recommendations and ASTM D 2321 for plastic pipe.
 - 2. Begin at lowest point of section being installed.
 - 3. Lay bell ends pointing upstream.
 - 4. Leakage, exfiltration or infiltration shall not exceed 100 gallons per inch of pipe diameter per mile per day for any section of the gravity sewer main, when tested under minimum positive head of 2 feet of water.
- C. Handling Pipe and Appurtenances:
 - 1. Protect pipe, fittings, and specialties during handling to prevent damage.
 - 2. Deliver to trench in sound, undamaged condition.
 - 3. Use web slings. End hooks not allowed.
- D. Inspect for Defects:
 - 1. Tap DIP pipe with light hammer to detect cracks.
 - 2. Replace defective, damaged or unsound pipe and appurtenances.
- E. Protection of Pipe Interior:
 - 1. Clean pipe interior of foreign material before lowering into trench.
 - 2. Keep clean at all times.

3. Securely close open pipe ends and fittings with watertight plugs during nonworking periods including:
 - a. When pipe laying is not in progress.
 - b. Nights.
 - c. Weekends.
- F. Cutting Pipe:
 1. Use methods recommended by manufacturer.
 2. Cut pipe in neat, workmanlike manner without damage to interior lining or exterior coating.
 3. Use approved mechanical cutter.
 4. Grind smooth and bevel cut ends.
- G. Joining Pipe:
 1. Use methods recommended by manufacturer to assemble pipes and fittings.
 2. Use minimum amount of gasket lubricant necessary to allow safe and efficient assembly of pipes and fittings.
- H. Pipe Deflections:
 1. Allowed only with permission of Engineer or if shown in the Drawings.
 2. Do not exceed manufacturer's recommendations for type and size of pipe and joint being used.
 3. Utilize bend fittings or shorter lengths of pipe where necessary to achieve desired alignment.
- I. Pipe Gradient:
 1. Lay pipe to slope gradient noted in the Drawings using laser equipment.
- J. Separation Between Water Mains and Sewer Lines:
 1. Maintain minimum of 10 feet horizontal separation of water mains from sewer lines. Measured from face of pipe to face of pipe.
 2. Maintain minimum of 18 inches vertical separation where sewer and waterlines cross. Measured from face of pipe to face of pipe.
 - a. Center 1 full length (approximately 20 feet) of water main pipe at sewer line crossing.
 - b. Correct any misalignment and/or loosened joints of sewer line prior to backfilling.
 - c. Carefully compact backfill beneath sewer line to prevent misalignment.
 - d. Repair any damage to sewer line at no cost to Owner. Use Engineer approved method of repair.

- K. Polyethylene Encasement:
1. Wrap buried ductile iron and cast iron pipe and fittings with polyethylene encasement per ANSI/AWWA C105.
 2. Repair damaged areas of polyethylene encasements with an adhesive PVC, 10 mil minimum thick tape or equal.
- L. Trace Wire, Trace Wire Terminal Access Box and Marker Posts with Test station:
1. Place trace wire in trench adjacent to the sewer main, as shown in the Drawings.
 2. Terminate trace wire in a trace wire terminal access box or marker posts with test station.
 3. Minimum bury of trace wire from sewer main to terminal access box or marker post: 36 inches.
 4. Boring with Casing Pipe, Dry Boring and Directional Boring:
 - a. Attach trace wire to carrier pipe as required.
 - b. Install a terminal access box or marker post with test station at each end of the boring or casing pipe.
 5. Test trace wire to ensure continuity.
 6. Maximum length between trace wire terminal access boxes or marker posts: As shown in the Drawings or specified in Section 01 10 00 – Special Provisions.
- M. Marker Post with Test Station and Decals:
1. Furnish and install marker posts with test station, as shown in the Drawings or specified in Section 01 10 00 – Special Provisions.
 2. Maximum spacing as specified in Section 01 10 00 – Special Provisions or as shown in the Drawings.
 3. See Drawings or Section 01 10 00 – Special Provisions for special wording (If Required)
 4. Place decal on each marker post.
- N. Depth of Cover:
1. Sewer Force Main: Minimum depth of cover shall be 5.5 feet, unless noted otherwise in the Drawings.
 2. Depth of cover is measured from top of pipe to finish grade elevation.

3.04 RESTRAINED JOINT PIPE INSTALLATION

- A. Restrained Joint Ductile Iron Pipe:
1. Provide restrained joint ductile iron pipe as shown in the Drawings. Include detailed laying schedule.

2. Field cutting of restrained joint pipe not allowed.
 - a. Exceptions: Locations that utilize a "field cut" restrained joint end kit as provided and recommended by pipe manufacturer and shown in the Drawings.
 3. Protect restraining mechanisms, tie rods, clamps or other components of dissimilar metal against corrosion by hand application of a suitable coating or by encasement of entire assembly with polyethylene film in accordance with ANSI/AWWA C105.
- B. Concrete Thrust Blocks:
1. Place concrete thrust blocks at bends, tees and dead ends against undisturbed soil.
 2. Location and Size: As shown in the Drawings.

3.05 HDPE PIPE INSTALLATION

- A. Location: As shown in the Drawings. Install pipe to the lines and grades shown in the Drawings.
- B. The Contractor shall use the proper tools and equipment necessary to safely install the high-density polyethylene (HDPE) pipe and fittings. The installation shall be in conformance with the manufacturer's requirements and instructions.
- C. HDPE pipe and fittings shall be assembled in the field with butt fusion joints. ASTM F2620 and the pipe manufacturer's recommended procedure shall be observed for butt fusion joints
- D. Butt fusion joints shall be made by qualified fusion technicians.
 1. Each fusion technician shall be separately qualified to make a butt fusion joint.
- E. Butt fusion machines shall incorporate the following properties, including the following elements:
 1. Heat Plate:
 - a. Heat plates and the non-stick coatings on heating surfaces shall be in good condition without gouges or scratches in the heating surfaces.
 - b. The non-stick coating shall be intact and free of any contamination.
 - c. Heater controls and temperature indicators shall function properly, and electrical cords and connections shall be in good condition.
 - d. The heat plate shall maintain a uniform and consistent temperature on all areas of the heating surfaces on both sides of the heat plate.
 2. Carriage:
 - a. Carriage shall travel smoothly with no binding at less than 50 psi for hydraulic fusion machines.
 - b. Clamps shall be in good condition with proper inserts for the pipe size being fused.

- F. If required by the Section 01 10 00 - Special Provisions, a data logger shall be provided on the fusion machine and fusion reports for each butt fusion joint performed on the project, including joints that were rejected shall be provided. The joint technician's joint report shall include:
 - 1. Pipe or fitting size, DR, and pressure rating
 - 2. Fusion equipment size and identification
 - 3. Fusion technician identification
 - 4. Job identification number and fusion number
 - 5. Fusion joining parameters
 - 6. Ambient temperature
- G. The following equipment shall be required during fusion:
 - 1. Pipe rollers shall be used to support pipe to either side of the butt fusion machine to provide vertical and lateral pipe alignment through the butt fusions machine.
 - 2. A protective enclosure that provides for full machine motion of the clamps, heat plate, fusion assembly and carriage shall be provided during fusion in inclement and/or windy weather. Pipe ends shall be covered or blocked where open pipe ends could allow prevailing winds to blow through the pipe.
- H. Horizontal directional drilling of HDPE pipe shall conform to ASTM D2321 and pipe manufacturer's recommendations.

3.06 BORING WITH CASING PIPE

- A. Location: As shown in the Drawings. Install pipe to the lines and grades shown in the Drawings.
- B. Refer to permit.
 - 1. Boring under federal and state highways shall be done in strict compliance with all conditions of the permit, including but not limited to:
 - a. State Policy for Accommodating Utilities on State Highway Right-of-Way.
 - b. State Standard Specifications for Highway Construction, latest edition, including all current supplemental specifications.
 - 2. Boring under railroad tracks shall be done in strict compliance with all conditions of the railroad permit.
 - 3. Refer to permit provided by governmental (County or Municipal) agency. Boring shall be done in strict compliance with all conditions of the permit.
- C. Encase sanitary sewer mains and service lines that cross roadways from toe of fill slope to toe of fill slope and urban streets to a point 6 feet back of curb or as shown in the Drawings.
- D. Pits for boring, tunneling or jacking not permitted closer to roadway than toe of fill slope or toe of foreslope in rural areas or 2 feet back of curb in urban sections or as shown in the Drawings.

- E. Installation of casing and pipe accomplished by boring, tunneling or jacking methods.
 - 1. Use of water under pressure (jetting) or puddling not permitted.
 - 2. Water used to lubricate cutter and pipe, with Engineer approval, considered as dry boring.
- F. Boring or tunneling operation, including location of bore pit, shall be conducted in a manner which is not detrimental to the roadway being crossed.
- G. Take prompt remedial action when excessive voids or oversized bored holes are produced by filling the bore with concrete or pressurized grout and beginning a new bore hole. Obtain approval of Engineer prior to abandoning a completed bored or tunneled hole unless safety is an immediate concern.
- H. Bore hole diameter for casing pipe shall not to exceed the casing pipe diameter by more than 1 1/2 inches for casing pipe having inside diameter of 12 inches or less.
- I. Bore hole diameter for casing pipe shall not to exceed the casing pipe diameter by more than 2 inches for casing pipe having inside diameter of greater than 12 inches.
- J. Install sanitary sewer main 4 inches or greater in diameter through casing pipe using chocks strapped to sewer pipe and large enough to provide clearance between casing and pipe couplings.
 - 1. Follow manufacturer's recommendations, minimum.
 - 2. Spacing of Chocks:
 - a. Maximum 10-foot centers for ductile iron pipe
 - b. Maximum 6-foot centers for PVC pipe
 - c. or as shown in the Drawings.
- K. Leave space between carrier pipe and casing open.
- L. Seal annular space at end of casing with rubber end seal with stainless bands.
- M. Backfill bore pit.
 - 1. See Section 31 23 33 – Trenching for Utilities.
 - 2. Backfill over-excavated areas around the casing with compacted clean aggregate or rock.
 - 3. Backfill Compaction Density for Bore Pit: Per the geotechnical report or at least 95 percent of maximum dry density, Standard Proctor, if geotechnical report unavailable.

3.07 DRY BORING

- A. Location: As shown in the Drawings. Install pipe to the lines and grades shown in the Drawings.
- B. Use of water under pressure (jetting) or puddling is not permitted.
- C. Water used to lubricate cutter and pipe, with Engineer approval, considered as dry boring.

- D. Hole diameter for sanitary sewer main not to exceed outside diameter of bell or coupling plus 4 inches for pipe having inside diameter 4 inches or more.
- E. Where unstable soil conditions exist, conduct boring operation in a manner which is not detrimental to adjacent features or structures.
- F. Take prompt remedial action when excessive voids or oversize bore hole is produced or when abandoning a bored hole. Obtain approval of Engineer prior to taking action.
- G. Pressure grout all voids or abandoned holes caused by boring or jacking.
- H. Backfill Compaction Density for Bore Pit: Per the geotechnical report or at least 95 percent of maximum dry density, Standard Proctor, if geotechnical report unavailable.

3.08 DIRECTIONAL BORING

- A. Location: As shown in the Drawings. Install pipe to the lines and grades shown in the Drawings.
- B. In situations that are shown as open-cut in the drawings, deviations from the design profile may be cause for rejection of directional drilling as a proposed method of construction.
- C. Examination of Site:
 - 1. Verify horizontal and vertical alignment.
 - 2. Review soils report.
 - 3. Verify depth and location of waterlines and other utilities.
 - 4. Notify Engineer immediately of any observations affecting the work.
- D. Diameter of bore hole only large enough to properly install sanitary sewer without causing excessive stress on pipe.
- E. Do not exceed maximum bending radius of pipe as given by manufacturer.
- F. If required by the Section 01 10 00 - Special Provisions, Contractor to plot the actual installed horizontal and vertical alignment of the pilot bore at intervals not to exceed 50 feet. Such data shall be provided with the as-built drawings.

3.09 SERVICES

- A. Location: As shown in the Drawings. Install pipe to the lines and grades shown in the Drawings.
- B. Connection to Main:
 - 1. Wye with watertight, rubber gasket joints, as shown in the Drawings.
 - 2. Saddles shall provide watertight, rubber gasket joints. Solvent weld saddle to PVC main and hold in place with stainless steel straps.
 - 3. Rotate wye or saddle 30 degrees up from horizontal.
 - 4. Install watertight plugs at end of future service lines.

- C. Connection to Existing Service Line:
 - 1. Watertight flexible coupling shall provide connection of pipes of same or different sizes and materials quickly and easily.
 - 2. Shall include a stainless steel shear ring.
 - 3. Watertight flexible coupling shall provide positive seal against infiltration and exfiltration.
 - 4. Watertight flexible coupling shall be leakproof, root proof and be resistant to chemicals, ultraviolet rays, fungus growth, and normal sewer gases.
 - 5. Watertight flexible coupling shall have stainless steel clamps that are corrosion-resistant and rustproof.

3.10 FIELD QUALITY CONTROL

- A. If tests indicate work does not meet specified requirements, remove defective materials/work and replace and retest; and/or take necessary remedial action and retest, all at no cost to Owner.
- B. Compaction density testing shall be performed on compacted fill in accordance with ASTM D 1556, ASTM D 2167, or ASTM D 6938.
 - 1. Results shall be evaluated in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D 698 "standard proctor", ASTM D 1557 "modified proctor" or AASHTO T 180.
 - 2. Frequency of Backfill Compaction Tests:
 - a. Under Paving, Slabs-on-Grade and Similar Construction:
 - (1) 2 tests per 150 linear feet of main line, test lower portion and test upper portion of trench or as determined by Engineer.
 - (2) 1 test of each service line or as determined by Engineer.
 - b. Non-paved Area:
 - (1) 2 tests per 300 linear feet of main line, test lower portion and test upper portion of trench or as determined by Engineer.
 - (2) 1 test of each service line or as determined by Engineer.
 - 3. If tests indicate work does not meet specified requirements, remove defective materials/work and replace and retest; and/or take necessary remedial action and retest, all at no cost to Owner.
- C. Perform hydrostatic test of pressure sewer pipe (force mains) at Contractor's expense.
 - 1. If tests indicate work does not meet specified requirements, remove defective materials/work and replace and retest; and/or take necessary remedial action and retest, all at no cost to Owner.

- D. Perform low pressure air test of gravity flow sewer pipe at Contractor's expense.
 - 1. If tests indicate work does not meet specified requirements, remove defective materials/work and replace and retest; and/or take necessary remedial action and retest, all at no cost to Owner.
- E. Perform alignment and deflection test of gravity flow sewer pipe at Contractor's expense.
 - 1. If tests indicate work does not meet specified requirements, remove defective materials/work and replace and retest; and/or take necessary remedial action and retest, all at no cost to Owner.
- F. Perform televised inspection of completed sanitary sewer system at Contractor's expense.
 - 1. If tests indicate work does not meet specified requirements, remove defective materials/work and replace and retest; and/or take necessary remedial action and retest, all at no cost to Owner.
- G. Trace Wire Test:
 - 1. If trace wire installed, Contractor shall perform a continuity test on all trace wire prior to the acceptance. This test may be performed by either hiring an acceptable underground utility locating firm to physically locate the trace wire in the presence of a representative of Owner or via low voltage circuit completed with the use of a suitable voltage source and meter to ensure continuity of the trace wire.
 - 2. In the event that continuity cannot be demonstrated or difficulties with the locating or continuity test arise, the cause shall be isolated and corrected. Thereafter, the section in which the defective test occurred shall be retested as a unit and continuity of that section confirmed, all at no cost to Owner.

3.11 ALIGNMENT TOLERANCE

- A. Apply the following tolerances for sanitary sewer piping installed by open trench construction or installed inside a casing pipe.
 - 1. Gravity Sewer Main:
 - a. General alignment shall be checked using televised inspection of the gravity sewer main.
 - b. Maximum allowable horizontal and vertical alignment variance from design line and grade shall be the greater of:
 - (1) +/- 5% of the inside diameter of the pipe.
 - (2) or +/- 1/2 inch.
 - c. Remove and reinstall pipe to proper grade where there is standing water greater than the maximum allowable depth.
 - 2. Force Main: Do not allow horizontal and vertical alignment of trenched force mains to vary from design line and grade by more than 3 inches.

- B. Apply the following tolerances for sanitary sewer piping installed by directional boring.
1. Gravity Sewer Main:
 - a. General alignment shall be checked using televised inspection.
 - b. Maximum allowable horizontal and vertical alignment variance from design line and grade shall be:
 - (1) Horizontally: +/- 1.0 foot per 100 feet.
 - (2) Vertically: +/- 0.2 feet up to 100 feet; and an additional +/- 0.1 foot per 100 feet thereafter.
 - c. Remove and reinstall pipe to proper grade where there is standing water greater than the maximum allowable depth.
 2. Pressurized Pipe:
 - a. Maximum allowable horizontal and vertical alignment variance from design line and grade shall be:
 - (1) Horizontally: +/- 2.0 feet.
 - (2) Vertically: +/- 1.0 foot. Maintain the minimum depth of cover specified in the specifications or shown in the Drawings.

3.12 CLEANING SEWER LINES

- A. General:
1. Plug downstream manholes.
 2. Flush and clean sewer lines and manholes prior to testing.
 3. Remove debris at manholes.
 4. Do not allow debris to enter existing sewer system.

3.13 TESTING

- A. Hydrostatic Testing of Pressure Sewer Pipe (Force Main)
1. General:
 - a. Perform Hydrostatic Pressure Testing of force main piping and appurtenances in accordance with AWWA C600 or C605.
 - b. Test performed simultaneously with flushing.
 - c. Furnish and install temporary pipe plugs, caps, flanges, valves or other pipe termination devices and blocking as necessary to permit hydrostatic pressure testing of the pipeline to be performed.
 2. Preparation:
 - a. Slowly fill pipeline with clean water.
 - b. Expel air from system. Extreme care must be taken to ensure that all air is expelled from the pipeline before testing. This may require several

cycles of pressurizing and bleeding the trapped air, prior to beginning the test.

- (1) Open air valve(s) to release air and close air valves prior to testing.
- (2) Install corporation stops at high points, as necessary, and open to release air. Close corporation stops, prior to beginning the test.
 - (a) Owner's option after testing completed and accepted: Remove corporation stop and install plug, or leave corporation stop in place and cap.

- c. The pipeline should stand full of water for at least 24 hours prior to conducting the hydrostatic test, to allow air to escape.

3. Test:

- a. Test Pressure: 150 psi or as directed by Engineer.

- (1) The pressure applied at the test site shall be the pressure necessary to create the specified test pressure at the lowest point along the section of the pipeline being tested. The pressure applied at the test site shall be determined based on the specified test pressure, and the relative elevation of the lowest point along the section of pipeline being tested and the elevation of the test gage.
- (2) Test pressure shall not be less than 1.25 times the working pressure at highest point of test section. (Working pressure is the anticipated maximum sustained operating pressure.)
- (3) Test pressure shall not be less than 1.50 times the working pressure at lowest point of test section. (Working pressure is the anticipated maximum sustained operating pressure.)
- (4) Test pressure shall not exceed 1.5 times the pressure rating of the pipe (as specified by the manufacturer).
- (5) Test pressure shall not exceed the rated working pressure of the valves, fittings and appurtenances, or the thrust restraint design pressure.
- (6) The pipeline shall be allowed to stabilize at the test pressure before conducting the hydrostatic test.

- b. Minimum Test Period: 2 hours.

- c. Testing Allowance:

- (1) Testing allowance is the maximum quantity of makeup water that is added into the section of the pipeline undergoing hydrostatic testing, in order to maintain pressure within +/- 5 psi of specified test pressure throughout the test period.

- (2) No pipe installation will be accepted, if the quantity of makeup water is greater than that determined by the following formula:

$Q = LD \times \sqrt{P}$ divided by 148,000 where

Q = Quantity of makeup water, in gallons per hour

L = Length of pipe section being tested, in feet

D = Nominal diameter of the pipe, in inches

P = Average test pressure during the hydrostatic test, in pounds per square inch (gauge)

\sqrt{P} means the square root of P

- d. Replace damaged or defective pipe, fittings, appurtenances or joints that are discovered during or following the test.
- e. Completion of Hydrostatic Test:
- (1) If the quantity of makeup water is less than the testing allowance, as stated above, the Hydrostatic Test for the section of the pipeline being tested passes.
- (2) If the quantity of makeup water is greater than the testing allowance, as stated above, the Hydrostatic Test for the section of the pipeline being tested fails.
- (a) Locate and repair all leaks.
- (b) Repeat Hydrostatic Test, until satisfactory results are obtained.

B. Low Pressure Air Test of Gravity Flow PVC Sewer Pipe:

1. General:
- a. Test in accordance with ASTM F 1417.
- b. Test individual section(s) between pneumatic plugs.
- c. Test pressure of 3.5 psi at start of test.
- d. More than 1.0 psi pressure drop during test time indicates failed test.
2. Preparation:
- a. Flush line to eliminate debris and to wet pipe surface.
- b. Install pneumatic plugs at ends of test section.
- (1) Safety Precautions:
- (a) No one allowed in manhole during test.
- (b) Install plugs securely.
- (c) Brace plugs if necessary.
- (d) Do not over pressurize lines.

- (e) Seal length equal to or greater than pipe diameter.
 - (f) Use regulator or relief valve set no higher than 9 psi.
 - c. Pass all air through single control point.
- 3. Test Procedure:
 - a. Verify pneumatic plugs are installed and properly seated to form seal.
 - b. Add air to internal pressure of 4 psi.
 - c. Allow pressure to stabilize 2 to 5 minutes depending on pipe size.
 - d. Reduce pressure to 3.5 psi to begin test period.
 - e. More than 1.0 psi pressure drop during test time indicates failed test.

Test Time: See table.

TABLE 1 - Minimum Specified Time Required for a 1.0 psig Pressure Drop for Size and Length of Pipe Indicated for Q = 0.0015

Note 1 = See Practice UNI-B-6, Recommended Practice for Low-Pressure Air Testing of Installed Sewer Pipe.

Note 2 - Consult with pipe and appurtenances manufacturer for maximum test pressure for pipe size greater than 30 in. in diameter.

Pipe Dia., in.	Min. Time, min's	Length for Min. Time, ft.	Time for Longer Length, sec.	Specification Time for Length (L) Shown, min's							
				100 ft	150 ft	200 ft	250 ft	300 ft	350 ft	400 ft	450 ft
4	3:46	597	0.380 L	3:46	3:46	3:46	3:46	3:46	3:46	3:46	3:46
6	5:40	398	0.854 L	5:40	5:40	5:40	5:40	5:40	5:40	5:42	6:24
8	7:34	298	1.520 L	7:34	7:34	7:34	7:34	7:36	8:52	10:08	11:24
10	9:26	239	2.374 L	9:26	9:26	9:26	9:53	11:52	13:51	15:49	17:48
12	11:20	199	3.418 L	11:20	11:20	11:24	14:15	17:05	19:56	22:47	25:38
15	14:10	159	5.342 L	14:10	14:10	17:48	22:15	26:42	31:09	35:36	40:04
18	17:00	133	7.692 L	17:00	19:13	25:38	32:03	38:27	44:52	51:16	57:41
21	19:50	114	10.470 L	19:50	26:10	34:54	43:37	52:21	61:00	69:48	78:31
24	22:40	99	13.674 L	22:47	34:11	45:34	56:58	68:22	79:46	91:10	102:33
27	25:30	88	17.306 L	28:51	43:16	57:41	72:07	86:32	100:57	115:22	129:48
30	28:20	80	21.366 L	35:37	53:25	71:13	89:02	106:50	124:38	142:26	160:15
33	31:10	72	25.852 L	43:05	64:38	86:10	107:43	129:16	150:43	172:21	193:53
36	34:00	66	30.768 L	51:17	76:55	102:34	128:12	153:50	179:29	205:07	230:46

- 4. Defective Materials and/or Workmanship:
 - a. Acceptance based on leakage test.
 - b. Locate and repair all visible leaks.

- c. Replace damaged or defective pipe, fittings or joints.
 - d. Repeat test, until satisfactory results are obtained.
- C. Alignment and Deflection Test of All Gravity Flow Sewer Pipe:
 - 1. Provide alignment and deflection test 30 days or more after backfilling trench.
 - 2. Alignment shall be checked by using either a laser beam or lamping.
 - 3. Deflection testing: Use rigid ball or mandrel having not less than 95 percent of base inside diameter or average inside diameter of pipe depending on which is specified in ASTM to which the pipe is manufactured.
 - a. Allowable Deflection: 5 percent or less.
 - b. Mechanical pulling devices not allowed.
 - 4. Defective Materials and/or Workmanship:
 - a. Acceptance based on alignment and deflection test.
 - b. Locate misaligned and/or deflected section.
 - c. Correct alignment and/or deflection.
 - d. Replace damaged or defective materials.
 - e. Repeat alignment and deflection test, until satisfactory results are obtained.
- D. Televised Inspection:
 - 1. Provide televised inspection of completed gravity sanitary sewer main performed by testing laboratory, independent Contractor or method approved by Engineer.
 - 2. Includes:
 - a. Digital recording, in a format agreed upon by Owner and Engineer.
 - b. Written log of location of:
 - (1) Service wyes or saddle as measured from manhole.
 - (2) Location of defects in pipe or joints.
 - (3) Location of debris in pipe.
 - (4) Location of any sag.
 - (5) Other notable items in pipe.
 - 3. Defective Materials and/or Workmanship:
 - a. Acceptance based on televised inspection.
 - b. Repair defects in pipe.
 - c. Replace damaged materials.
 - d. Repeat TV inspection, until satisfactory results are obtained.

END OF SECTION

THIS PAGE CONCLUDES
THE
SPECIFICATIONS
FOR THE
WALNUT CREEK SEWER REPAIR
FOR
CRETE, NEBRASKA

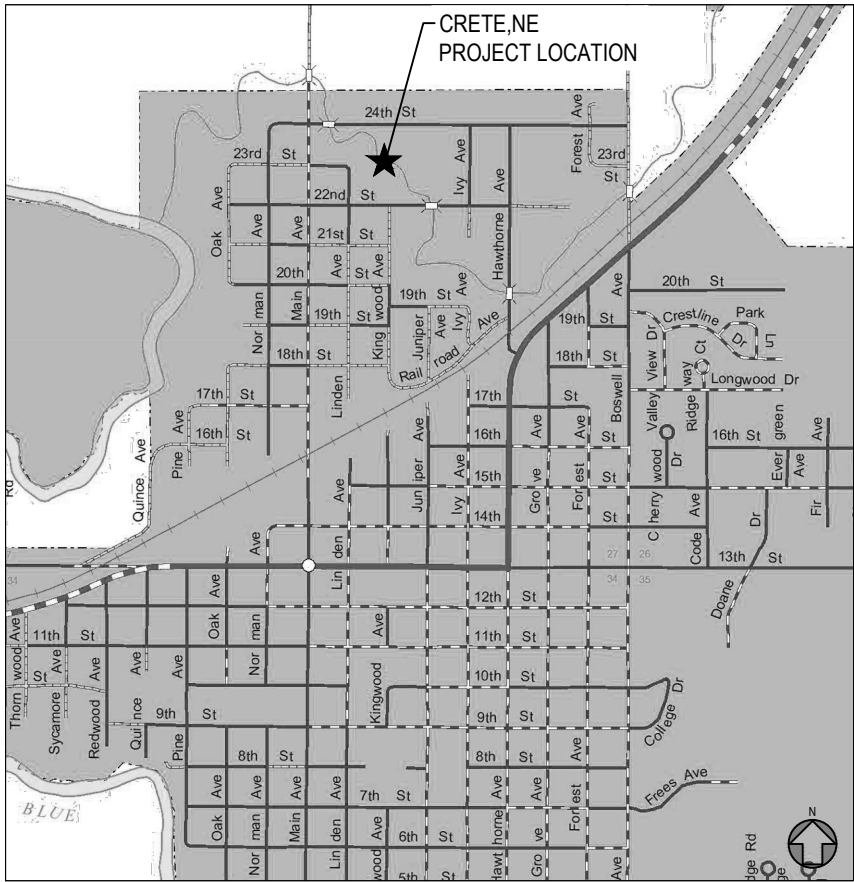


WALNUT CREEK SEWER REPAIR

CITY OF CRETE NEBRASKA
243 EAST 13TH STREET
CRETE, NE 68333

JEO Project No.: 241729.00

LOCATION MAP



Scale: N.T.S.

SHEET IDENTIFICATION

DISCIPLINE DESIGNATOR	
G	GENERAL
C	CIVIL
A	ARCHITECTURAL
S	STRUCTURAL
M	MECHANICAL
P	PLUMBING
E	ELECTRICAL

SHEET TYPE DESIGNATOR	
0	GENERAL
1	PLANS AND COMBINATION PLAN & PROFILE
2	ELEVATIONS AND PROFILES
3	SECTIONS
4	LARGE SCALE VIEWS
5	DETAILS
6	SCHEDULES AND DIAGRAMMS
7	NOT USED
8	NOT USED
9	3D REPRESENTATIONS

CONTACTS

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243 EAST 13TH STREET
CRETE, NE 68333

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COORDINATING PROFESSIONAL:



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ABEAUCLAIR@JEO.COM
P: 402.474.8744

I, AARON D. BEAUCLAIR, am the coordinating professional on the Walnut Creek Sewer Repair project.

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P: 1.866.445.8084

FIBER OPTIC:

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ALLO COMMUNICATIONS LLC
P: 515.635.4610

INDEX OF SHEETS

SHEET NO.	SHEET NAME
G001	COVER
G002	SYMBOLS
V101	HORIZONTAL AND VERTICAL CONTROL
C101	SITE PLAN
C102	BYPASS PUMPING PLAN
C201	PLAN AND PROFILE
C501	DETAILS
S501	STRUCTURAL DETAIL

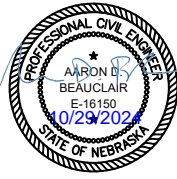


JEO CONSULTING GROU

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Organization Certificate of
Authorization Number: CA-0069

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10/29/2024
AARON D. BEAUCLAIR
E-16150

ISSUE

MARK	DATE	DESCRIPTION
FD	10/28/2024	FINAL

WALNUT CREEK SEWER REPAIR

CRETE, NEBRASKA
LAT: 40°38'03.62" N
LONG: 96°57'32.63" W

JEO Project No.: 241729.00
Sheet Size: 22" x 34"
Drawn by: ADP
QAQC: EEJ - 10/17/2024



COVER

G001



Know what's
Call below.
before you dig.



NOTE: NEITHER THE OWNER (CLIENT) NOR JEO CONSULTING GROUP, INC. ASSUMES ANY RESPONSIBILITY FOR UTILITY LOCATIONS BEING ACCURATELY SHOWN OR NOT SHOWN ON THE PLANS. A REQUEST FOR UTILITY LOCATES WAS MADE FOR THIS LOCATION AS PER THE ONE-CALL NOTIFICATION SYSTEM ACT.

(DATE: 9/10/2024 TICKET NO.: 242540093).
(DATE: 9/10/2024 TICKET NO.: 242540094).

UTILITIES SHOWN ARE FROM FIELD MARKINGS PROVIDED IN THE FIELD BY THE UTILITY PROVIDERS.

THE EXACT LOCATION AND/OR SIZE OF UNDERGROUND FEATURES MAY NOT BE ACCURATELY, COMPLETELY AND RELIABLY DEPICTED. FIELD VERIFICATION OF UTILITIES MAY BE REQUIRED. CONTRACTOR(S) SHALL NOTIFY THE RESPECTIVE UTILITY COMPANIES BEFORE COMMENCING ANY WORK.

LINESTYLES

ITEM	SYMBOL
BREAK LINE	
CABLE TELEVISION	
CABLE TV (NS)	
CENTERLINE OF ROAD	
CONTOUR MINOR (EX)	
CONTOUR MAJOR (EX)	
CONTOUR MINOR (EX,SCREENED)	
CONTOUR MAJOR (EX,SCREENED)	
CONTOUR MINOR (PR)	
CONTOUR MAJOR (PR)	
LIMITS OF CONSTRUCTION	
CULVERT	
ELECTRIC (OVHD)	
ELECTRIC (OVHD, NS)	
ELECTRIC (UGND)	
ELECTRIC (UGND, NS)	
FENCE (WOODEN)	
FENCE (WIRE OR UNKNOWN)	
FENCE (CHAINLINK)	
FENCE (SECURITY)	
FIBER OPTIC LINE	
FIBER OPTIC LINE (NS)	
FLOWLINE (BREAKLINE)	
GAS LINE	
GAS LINE (NS)	
GUARDRAIL	
PROPERTY BOUNDARY	
PROPERTY LOT LINES (PR)	
PROPERTY LINES (EX,NS)	
RIGHT-OF-WAY LINE	
RAILROAD RIGHT-OF-WAY	
RAILROAD TRACKS	
RETAINING WALL	
SANITARY SEWER (EX)	
SANITARY SEWER (NS)	
SANITARY SEWER (PR)	
SAN SEWER FORCE MAIN (EX)	
SAN SEWER FORCE MAIN (PR)	
STORM SEWER (EX)	
STORM SEWER (NS)	
STORM SEWER (PR)	
TELEPHONE LINE (UGND)	
TELEPHONE LINE (UGND,NS)	
TELEPHONE LINE (OVHD)	
TELEPHONE LINE (OVHD,NS)	
TERRACE	
CROPLINE	
TRAVELED WAY	
WATER (EX)	
WATER (NS)	
WATER (PR)	
FIRE SERVICE	
EXISTING	EX
EXISTING, NOT-SURVEYED	NS
PROPOSED	PR
OVERHEAD	OVHD
UNDERGROUND	UGND

COMMON HATCHING

ITEM	HATCH
ASPHALT PAVEMENT (EX.)	
CONCRETE PAVEMENT (EX.)	
GRAVEL (EX.)	
BRICK PAVEMENT (EX.)	
ASPHALT PAVEMENT (PR.)	
CONCRETE PAVEMENT (PR.)	
CONCRETE SIDEWALK (PR)	
GRAVEL (PR.)	
BRICK PAVEMENT (PR.)	
RIP RAP	
SEEDING	
MATTING	
UNDISTURBED EARTH	
EARTH	
GRANULAR FILL	
SAND MORTAR, PLASTER	
CONCRETE	
BRICK	
CONCRETE BLOCK	
METAL	
WOOD FRAMING	
WOOD FRAMING INTERRUPTED MEMBER	
BATT INSULATION	
RIGID INSULATION	

UTILITIES

ITEM	SYMBOL
STORM SEWER	
CURB INLET	
GRATE INLET	
CATCH BASIN	
STORM SEWER MANHOLE	
SANITARY	
CLEANOUT	
SEPTIC TANK	(S)
SANITARY MANHOLE	
POWER, ELECTRICAL, LIGHT, AND TRAFFIC	
AIR CONDITIONING UNIT	
ANTENNA	
ANCHOR POLE/POST	o
GUY POLE	
GUY WIRE ANCHOR	→
ELECTRICAL HIGHLINE TOWER (METAL OR CONCRETE)	
POWER POLE (EXISTING)	
POWER POLE (PROPOSED)	
POWER (ELEC) PEDESTAL	
POWER (ELEC) PULL BOX OR MANHOLE	
POWER (ELEC) METER	
LIGHT POLE	*
TRAFFIC SIGNAL	
TRAFFIC SIGNAL BOX	
TELEVISION PEDESTAL	
TELEVISION MANHOLE	
WATER	
WATER MANHOLE	
WATER VALVE	
WATER SHUT OFF OR CURB STOP	
WELL	
WATER METER	
WATER METER PIT	
YARD HYDRANT	
WATER ELEVATION	
WATER TOWER	
FIRE HYDRANT (EXISTING)	
FIRE HYDRANT (PROPOSED)	
FIRE HYDRANT IN PROFILE	
WATER FITTINGS	
11- 1/4°	
22- 1/2°	
45°	
90°	
CROSS	
PLUG	
REDUCER	
TEE	
GAS	
GAS METER	
GAS MANHOLE	
GAS FILL PIPE	
GAS PUMP	
GAS VALVE	
GAS VENT	
TELEPHONE	
FIBER OPTICS PULL BOX	
TELEPHONE POLE	o
TELEPHONE PULL BOX OR MANHOLE	
TELEPHONE PEDESTAL	
MANHOLE (NON-SPECIFIC)	
UNDERGRND STORAGE TANK	
VALVE (NON-SPECIFIC)	

SITE & SIGNAGE

ITEM	SYMBOL
SIGN	
BARRICADE	
ROAD SIGNS	
COUNTY ROAD	
INTERSTATE HIGHWAY	
STATE HIGHWAY	
U.S. HIGHWAY	
MILE MARKER POST	
RIGHT OF WAY MARKER	
RAILROAD CROSSING SIGNAL	
RAILROAD SWITCH	
FLAG POLE	
MAILBOX	
PROPANE TANK	
SATELLITE TV DISH	
WINDMILL	

CONTROL & ELEVATION

ITEM	SYMBOL
BENCHMARK	
CONTROL POINT (NON-PROPERTY)	
MONUMENT FOUND (PROPERTY)	
MONUMENT SET	
TEMPORARY POINT	
TEST BORING	
POINT ELEVATION (EXISTING)	
POINT ELEVATION (PROPOSED)	
TOP OF PAVEMENT	TP
TOP OF CURB	TC
GROUND	GR
TOP OF WALL	TW
BOTTOM OF WALL	BW
FLOWLINE	FL
GRID TICK	

MISC FEATURES

ITEM	SYMBOL
CENTER PIVOT	
CEMETERY	
GRAVE	
CHURCH	
CAVE	
CISTERN	
LATRINE	
OIL WELL	
GUARD POST	o

PAVING FEATURES

ITEM	SYMBOL
EXISTING PAVEMENT JOINT	
TRANSVERSE JOINT	
LONGITUDINAL JOINT	
EXPANSION/KEYED JOINT	
PAVEMENT MARKING	
PAVEMENT REBAR	
HANDICAP SYMBOL	

VEGETATION

ITEM	SYMBOL
BUSH	
CONIFEROUS TREE	
DECIDUOUS TREE	
MARSH/WETLAND	
TREE MASS LINE	
TREE STUMP	

SWPPP

ITEM	SYMBOL
SILT FENCE	
INLET PROTECTION	
STRAW WATTLE CHECK	
STRAW BALE CHECK	
FLOW ARROW (PLAN)	
AREA INLET	
FILTER PROTECTION	

GENERAL

ITEM	SYMBOL
PLAN REVISION	
NORTH ARROW	
GRAPHIC SCALE PLAN	
GRAPHIC SCALE PROFILE/ CROSS SECTION	
KEYNOTE OR TABULAR NOTE	
REFERENCED NOTE	
ELEVATION	
SECTION	
ENLARGED DETAIL	



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[Consultant Title and Discipline]
 Organization Certificate of
 Authorization Number: [XX-000]
 [Address Line 1]
 [City, State 000000]
 [000.000.0000]



10/29/2024
 AARON D. BEAUCLAIR
 E-16150

ISSUE

MARK DATE DESCRIPTION
 FD 10/28/2024 FINAL

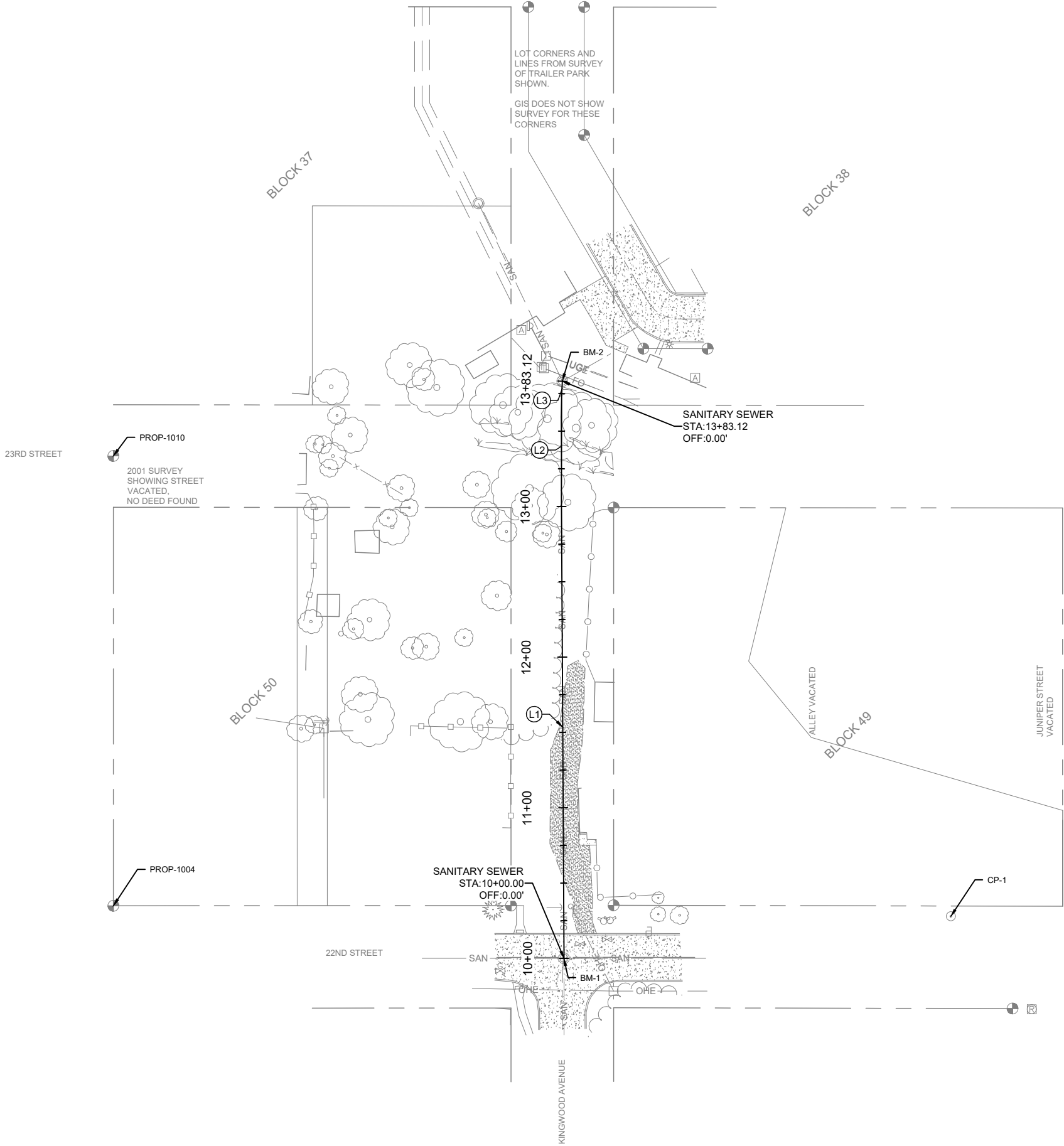
WALNUT CREEK SEWER REPAIR

CRETE, NEBRASKA
 LAT: 40°38'03.62" N
 LONG: 96°57'32.63" W

JEO Project No.: 241729.00
 Sheet Size: 22" x 34"
 Drawn by: ADP
 QAQC: EEJ - 10/17/2024



SYMBOLS



NOTE:
 CONSTRUCTION BENCHMARKS WILL BE ESTABLISHED
 BY JEO AT THE TIME OF CONSTRUCTION

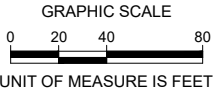
HORIZONTAL SURVEY CONTROL - SALINE COUNTY LDP			
POINT NAME	NORTHING US SURVEY FEET	EASTING US SURVEY FEET	LONG DESCRIPTION
CP-1	108198.82	131070.90	MAG NAIL SET IN CONCRETE SIDE WALK
PROP-1004	108205.76	130515.09	5/8" REBAR
PROP-1010	108504.35	130515.03	5/8" REBAR

BENCHMARKS - NAV88				
POINT NAME	NORTHING US SURVEY FEET	EASTING US SURVEY FEET	ELEVATION	LONG DESCRIPTION
BM-1	108171	130814	1353.33	SAMM RIM
BM-2	108554	130813	1352.83	SAMM RIM

SANITARY SEWER ALIGNMENT				
NUMBER	LENGTH	LINE/CHORD DIR	START STATION, N, E	END STATION N, E
L1	307.00	N00°19'13"W	10+00.00, 108170.84, 130814.14	13+07.00, 108477.84, 130812.43
L2	66.00	N00°06'29"E	13+07.00, 108477.84, 130812.43	13+73.00, 108543.84, 130812.55
L3	10.12	N02°51'57"E	13+73.00, 108543.84, 130812.55	13+83.12, 108553.95, 130813.06

LEGEND

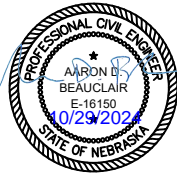
SYMBOL	DESCRIPTION
0+00 1+00	BASELINE ALIGNMENT (DESIGN)
(C1)	BASELINE ALIGNMENT CURVE TAG LABEL
(L1)	BASELINE ALIGNMENT LINE TAG LABEL
	BASELINE ALIGNMENT PI POINT
O	POINT OF CURVATURE OR TANGENCY



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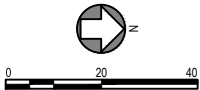
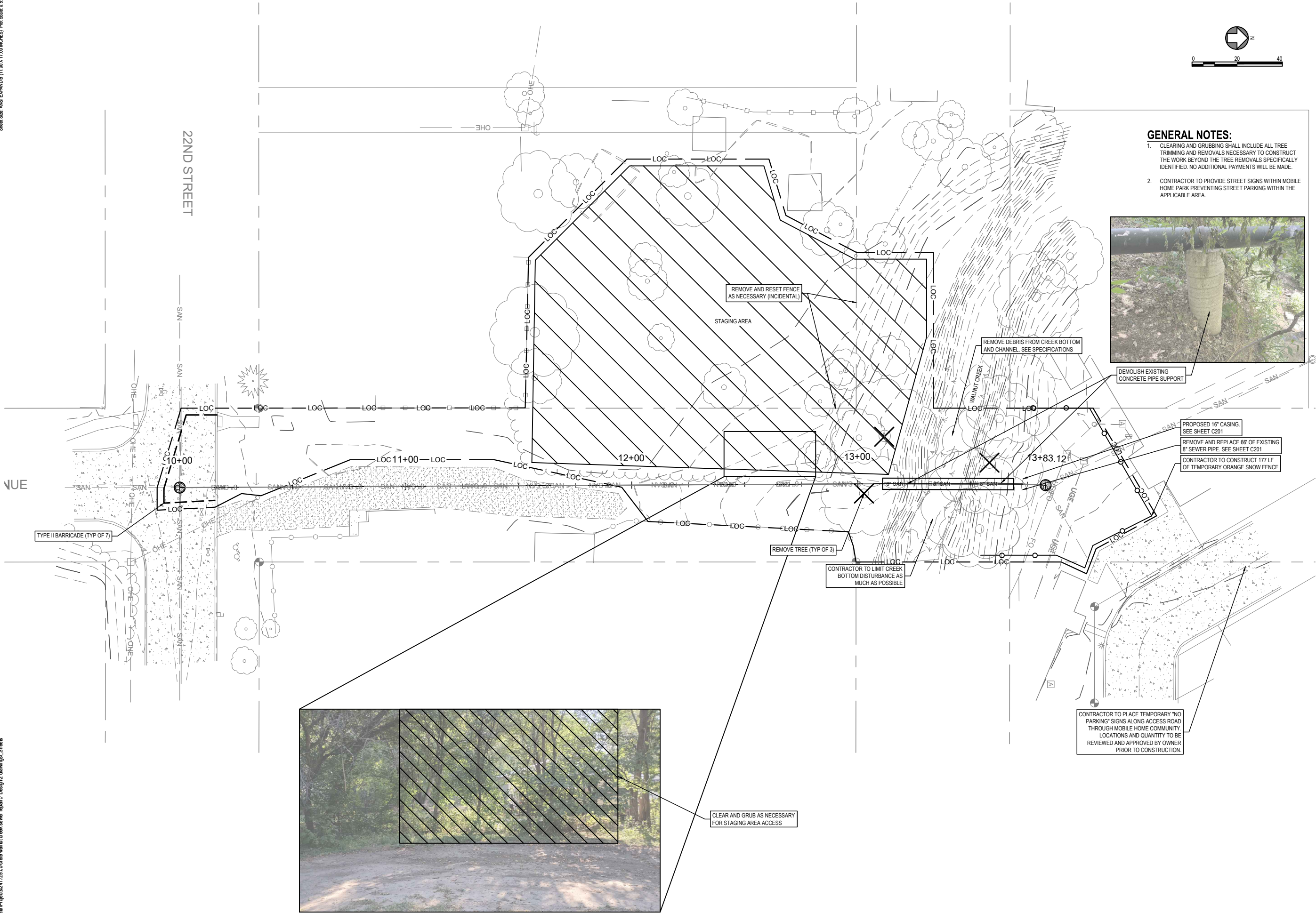
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HORIZONTAL ALIGNMENT AND
 CONTROL



GENERAL NOTES:

- CLEARING AND GRUBBING SHALL INCLUDE ALL TREE TRIMMING AND REMOVALS NECESSARY TO CONSTRUCT THE WORK BEYOND THE TREE REMOVALS SPECIFICALLY IDENTIFIED. NO ADDITIONAL PAYMENTS WILL BE MADE.
- CONTRACTOR TO PROVIDE STREET SIGNS WITHIN MOBILE HOME PARK PREVENTING STREET PARKING WITHIN THE APPLICABLE AREA.

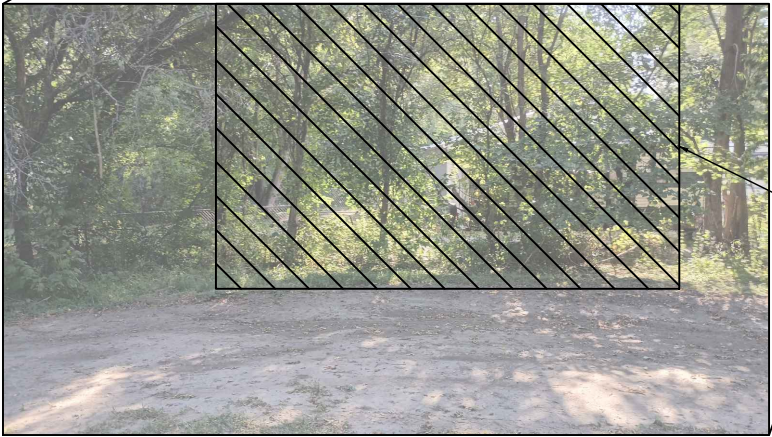


DEMOLISH EXISTING CONCRETE PIPE SUPPORT

PROPOSED 16" CASING. SEE SHEET C201
REMOVE AND REPLACE 66' OF EXISTING 8" SEWER PIPE. SEE SHEET C201
CONTRACTOR TO CONSTRUCT 177 LF OF TEMPORARY ORANGE SNOW FENCE

REMOVE TREE (TYP OF 3)
CONTRACTOR TO LIMIT CREEK BOTTOM DISTURBANCE AS MUCH AS POSSIBLE

CLEAR AND GRUB AS NECESSARY FOR STAGING AREA ACCESS



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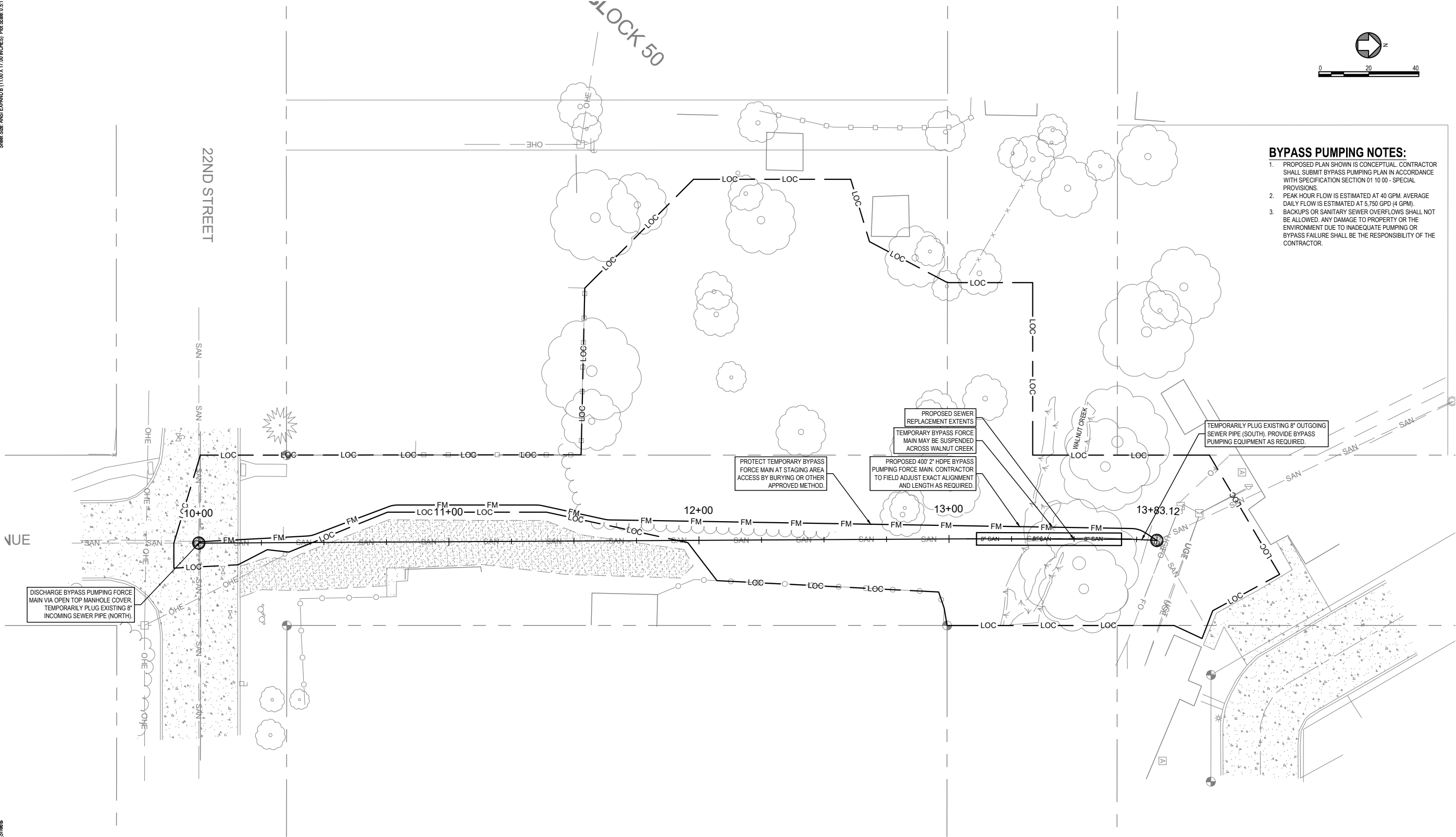
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SITE PLAN



BYPASS PUMPING NOTES:

1. PROPOSED PLAN SHOWN IS CONCEPTUAL. CONTRACTOR SHALL SUBMIT BYPASS PUMPING PLAN IN ACCORDANCE WITH SPECIFICATION SECTION 01 10 00 - SPECIAL PROVISIONS.
2. PEAK HOUR FLOW IS ESTIMATED AT 40 GPM. AVERAGE DAILY FLOW IS ESTIMATED AT 5,750 GPD (4 GPM).
3. BACKUPS OR SANITARY SEWER OVERFLOWS SHALL NOT BE ALLOWED. ANY DAMAGE TO PROPERTY OR THE ENVIRONMENT DUE TO INADEQUATE PUMPING OR BYPASS FAILURE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.



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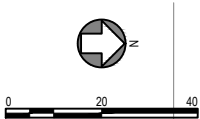
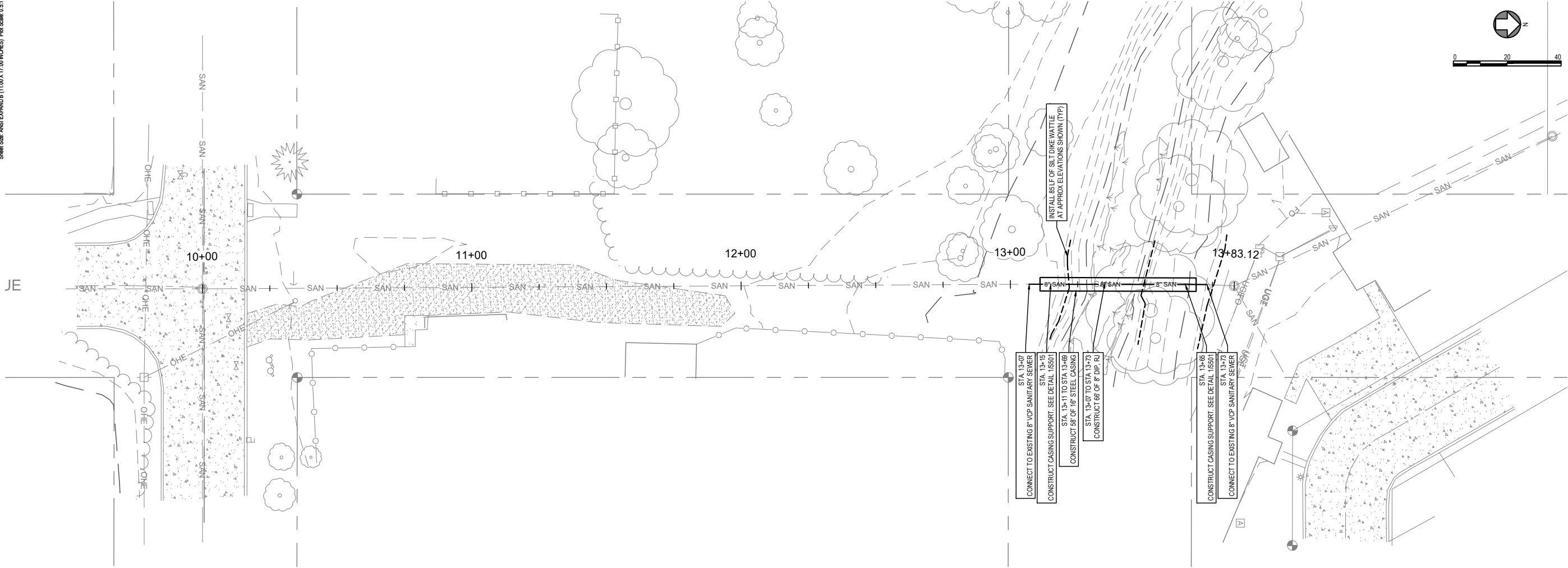
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BYPASS PUMPING PLAN



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GENERAL NOTES:

- RESEED ALL DISTURBED AREAS.
- INSTALL EROSION CONTROL MATTING OVER STEEP SLOPES WITHIN DISTURBED CREEK CHANNEL AREAS.

WALNUT CREEK SEWER REPAIR

CRETE, NEBRASKA

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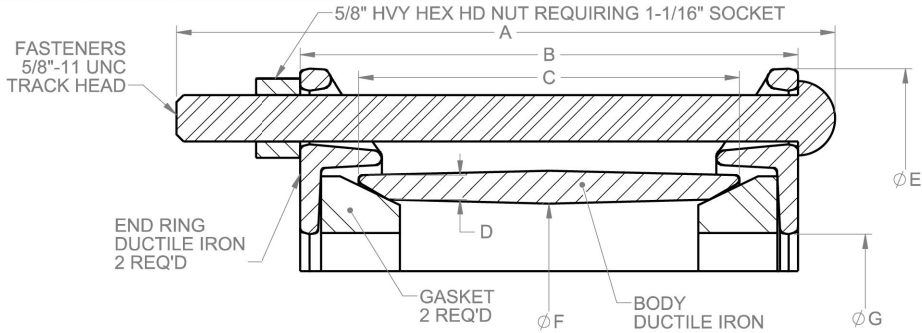
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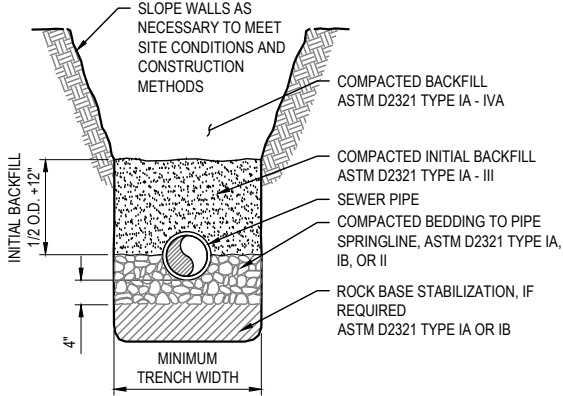
PLAN AND PROFILE

BODY SIZE							G			BOLTS		
	A	B	C	D	E	F	RED	BLACK	YELLOW	NO.	DIA.	LENGTH
2	8.50	7.10	5.00	0.34	6.30	3.04	3.05	N/A	N/A	2	5/8	8.00
3	11.00	7.30	5.00	0.38	7.39	4.04	4.05	N/A	N/A	4	5/8	10.50
4	8.50	7.00	5.00	0.34	8.63	5.46	4.90	5.35	5.50	4	5/8	8.00
6	8.50	7.00	5.00	0.45	11.19	7.63	7.00	7.37	7.63	5	5/8	8.00
8	8.50	7.00	5.00	0.45	13.44	9.85	9.16	9.53	9.80	6	5/8	8.00
10A	11.00	8.00	6.00	0.52	16.44	11.05	11.12	N/A	N/A	7	5/8	10.50
10B	11.00	8.00	6.00	0.52	16.44	12.20	N/A	11.44	12.21	7	5/8	10.50
12A	11.00	8.00	6.00	0.52	18.56	13.13	13.04	N/A	N/A	8	5/8	10.50
12B	11.00	8.00	6.00	0.52	18.56	14.58	N/A	13.69	14.50	8	5/8	10.50
14	12.00	9.00	7.00	0.55	21.25	16.96	16.53	15.87	17.06	9	5/8	11.50
16	12.00	9.00	7.00	0.55	23.25	19.06	18.61	17.97	19.05	10	5/8	11.50
18	12.00	9.00	7.00	0.75	25.00	20.35	19.18	19.72	20.40	12	5/8	11.50
20	12.00	9.00	7.00	0.75	26.75	22.43	21.37	22.00	22.31	12	5/8	11.50
22	12.00	9.00	7.00	0.75	28.88	24.42	23.50	24.19	24.50	13	5/8	11.50
24	15.50	12.00	10.00	0.8	31.50	26.49	25.45	26.13	26.56	14	5/8	15.00

NOTE:
1. FASTENERS: HSLA PER AWWA C111. STAINLESS STEEL TYPE 304 OR 316 AVAILABLE UPON REQUEST.
2. PRESSURE RATED UP TO 260 PSIG WORKING, 325 PSIG TEST. FOR HIGHER PRESSURES CONTACT ROMAC ENGINEERING DEPARTMENT.

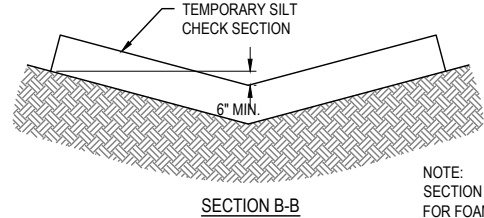
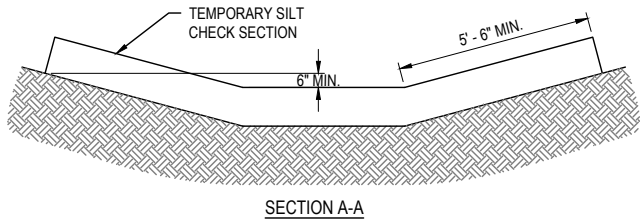


1 **ROMAC COUPLING**
SCALE: N.T.S.



PIPE SIZE	MIN. TRENCH WIDTH
4"	18"
6"	18"
8"	24"
10"	26"
12"	30"
15"	30"
18"	32"

2 **SANITARY SEWER TRENCH**
SCALE: N.T.S.



NOTE:
SECTION A-A & B-B ARE TYPICAL FOR FOAM TRIANGLE, WATTLE, & RIGID PLASTIC TRIANGLE TEMPORARY SILT CHECKS.

3 **SILT DIKE WATTLES**
SCALE: N.T.S.



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WALNUT CREEK SEWER REPAIR

CRETE, NEBRASKA

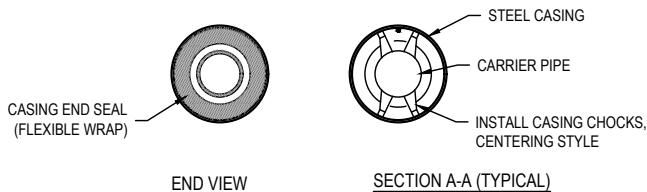
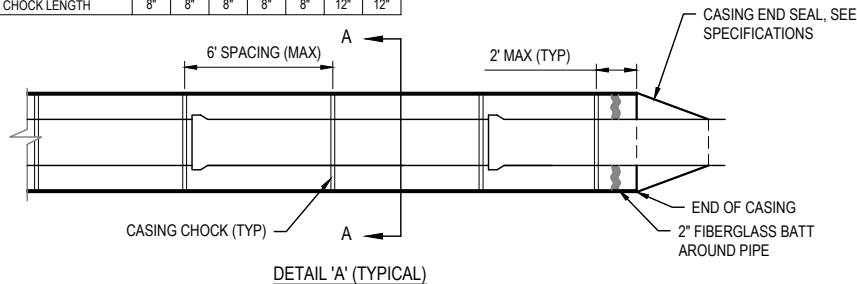
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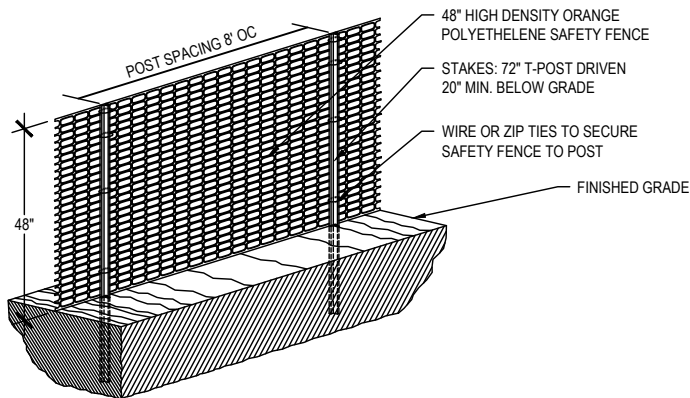


DETAILS

CASING AND CHOCK DETAIL TABLE							
CARRIER PIPE DIA.	4"	6"	8"	10"	12"	16"	24"
MIN. CASING DIA.	10"	12"	14"	16"	20"	24"	36"
CASING CHOCK LENGTH	8"	8"	8"	8"	8"	12"	12"

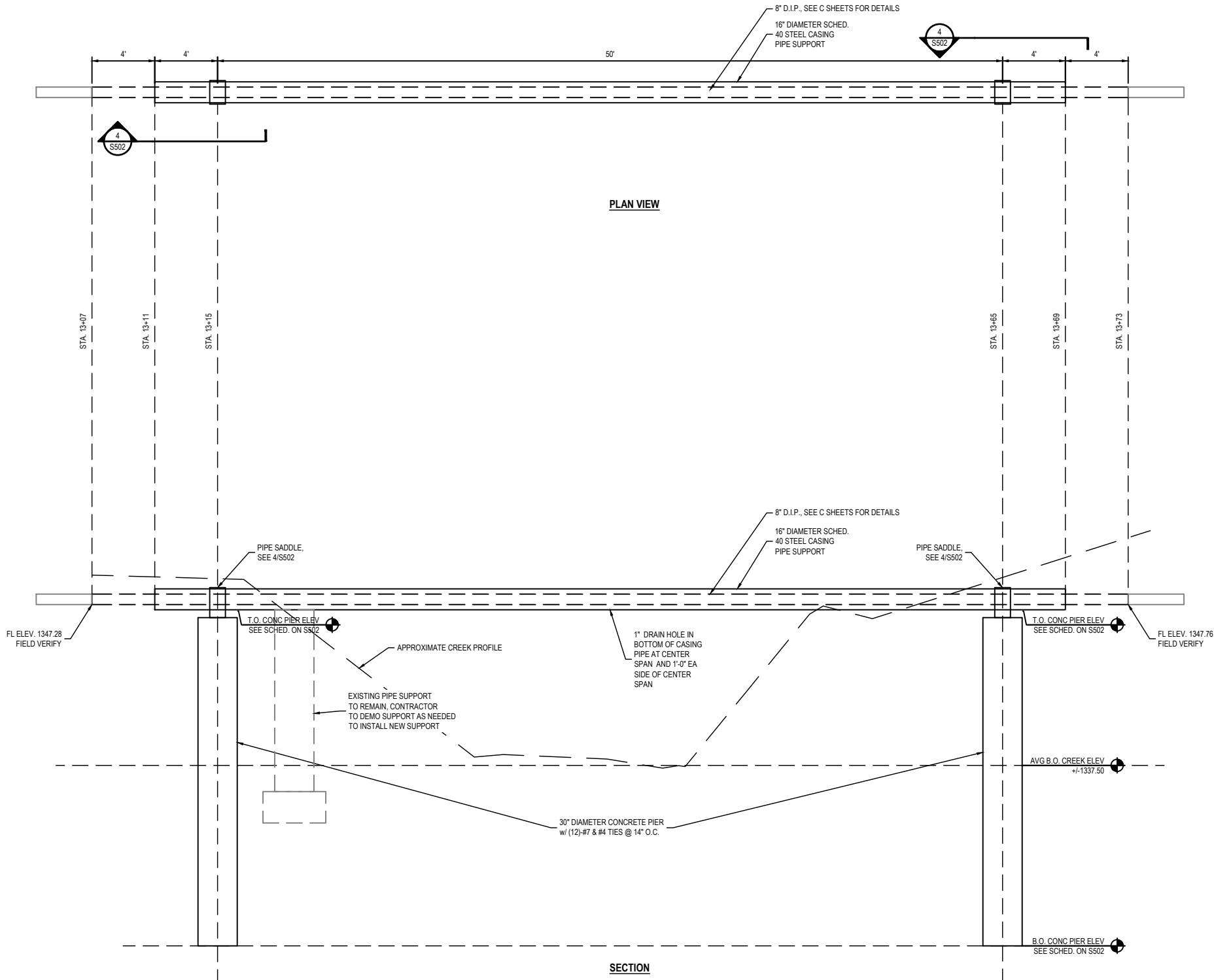


4 **STEEL CASING**
SCALE: N.T.S.

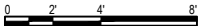


NOTE:
1. ALL SENSITIVE AREAS SHALL BE PROTECTED AS PER PLAN.
2. SAFETY FENCE SHOULD BE FASTENED SECURELY TO THE T-POSTS.
3. THE FENCING MUST REMAIN IN PLACE DURING ALL PHASES OF CONSTRUCTION; ANY CHANGE OF THE PROTECTIVE FENCING MUST BE APPROVED. PROTECTIVE FENCING MUST BE APPROVED.

5 **ORANGE SNOW FENCE**
SCALE: N.T.S.



1 PIPE SUPPORT
SCALE: 1/4\"=1'-0"



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STRUCTURAL DETAILS

DESIGN DATA – STRUCTURAL GENERAL NOTES

GOVERNING CODE/SPECIFICATIONS:
2018 International Building Code (IBC), and Nebraska Department of Transportation (NDOT) 2017 Standard Specifications.

DESIGN LOADING:
50 Year flood stream velocity: 9 FPS
Design Ice Thickness: 1.50"
Bearing Capacity: 1500 psf (Assumed)
Blows/Foot: N=4 (Assumed)

MATERIALS:

STRUCTURAL STEEL – ALL STEEL @ SUPPORTS, INCLUDING ENTIRE PIPE SADDLE SUPPORT TO BE H.D.G. (HOT-DIPPED GALVANIZED)
Rolled Shapes & Plates (at supports).....ASTM A-36 H.D.G.
Pipe.....ASTM A53 GRADE B
Welding Electrodes.....AWS D1.1, type required for materials being welded
BOLTS.....ASTM A325 TYPE 3
Anchor Bolts.....ASTM F1554 Gr. 36 H.D.G.
ALL WELDS TO BE SPRAY GALVANIZED WITH ZINC RICH PRIMER

CONCRETE
MIX DESIGN.....NDOT 47B-3000
REINFORCING.....ASTM-A615 GRADE 60 DEFORMED BARS

TYPICAL NOTES:

- Construction shall be per the current version of the NDOT standard specifications for highway construction.
- The contractor shall verify specifications, dimensions, and existing site conditions, including utilities, prior to starting work. any deviations or inconsistencies found shall be brought to the immediate attention of the engineer.
- The structure and elements shown on the plans are designed for stability under the final configuration only. The contractor is solely responsible for structural stability during construction.
- All de-watering requirements for construction are the responsibility of the contractor.
- No geotechnical investigation was done prior to design. Minimum soil standards were used for design. Geotechnical engineer is to be retained by **OWNER** to provide continuous testing and observation during all earthwork and pier construction. Geotech engineer to ensure minimum acceptable design criteria is met.

STRUCTURAL STEEL NOTES:

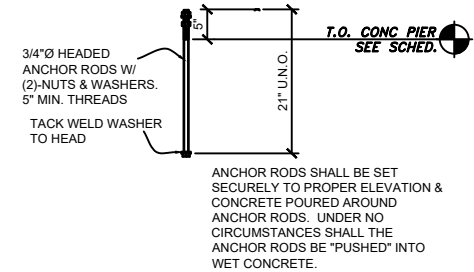
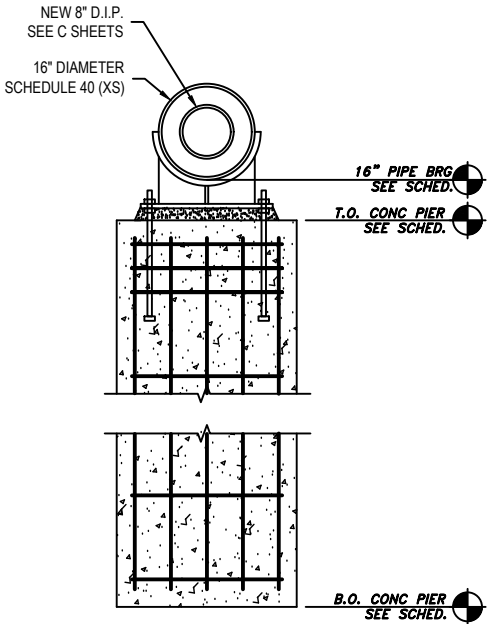
- Structural steel shall be fabricated and erected in conformance with "AISC Specification for Design, Fabrication, and Erection of Structural Steel For Buildings".
- Nuts, bolts, and washers used in the assembly shall be hot-dipped galvanized.
- Comply with American Welding Society standards. ALL welders shall have valid certificates and have current experience in the types of welds called for. All welds to meet AWS D1.1 standards.
- Submit shop drawings for all structural steel to the ENGINEER for approval.

CONCRETE PIER NOTES:

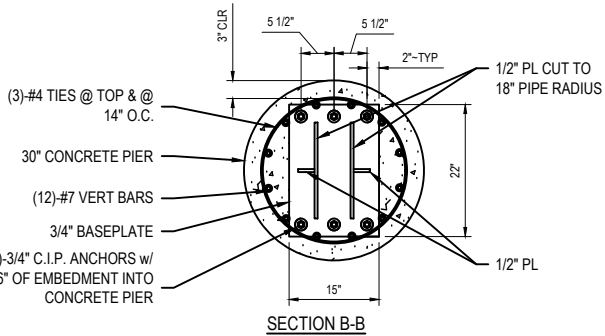
- All piers shall be driven per Section 702, 704 and 707 of NDOT Standard Specifications.
- Pier installation shall be observed and recorded by the engineer.
- Allow concrete to cure to 75% design strength (2250 psi), before applying any load.
- Concrete reinforcement clear cover is to be 2" clear at top of pier and 3" clear everywhere unless noted otherwise (U.N.O.).
- No permanent casing or stay in place forming is allowed.
- Submit concrete mix design to engineer for review.

1 GENERAL NOTES
SCALE: NO SCALE

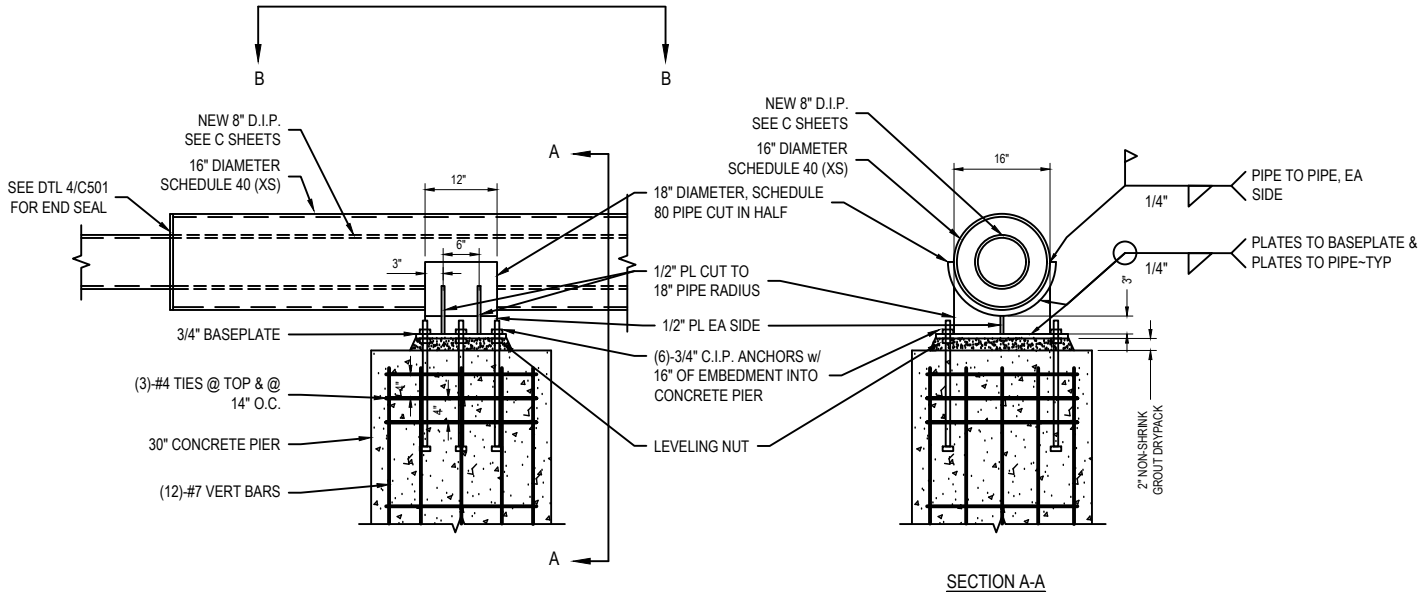
PIER ELEVATIONS DATA			
LOCATION	16" PIPE BEARING ELEVATION	T.O. CONC PIER ELEVATION	B.O. CONC PIER ELEVATION
SOUTH PIER STA. 13+15	1347.02	1346.47	1326.00
NORTH PIER STA. 13+65	1347.39	1346.83	1326.00
PIER DATA NOTES: <ul style="list-style-type: none">T.O. = Top ofB.O. = Bottom ofSee structural general notes, plan and details for additional informationContractor to verify all existing elevations prior to construction			



2 PIER ELEVATION TABLE & DETAIL
SCALE: NO SCALE



3 TYPICAL ANCHOR DETAIL
SCALE: NO SCALE



4 PIER CONNECTION DETAIL
SCALE: NO SCALE



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WALNUT CREEK SEWER REPAIR

CRETE, NEBRASKA
LAT: 40°38'03.62\"/>

JEO Project No.: 241729.00
Sheet Size: 22\"/>



STRUCTURAL DETAILS