BID SET

PROJECT MANUAL

FOR

ARPA
2022 SEWER INFRASTRUCTURE IMPROVEMENTS
CONTRACT 1
TREATMENT AND COLLECTION SYSTEM IMPROVEMENTS
CWSRF PROJECT NO. CS010864-02

FOR THE

CITY OF BRUNDIDGE, ALABAMA

MAYOR
Isabell Boyd

CITY COUNCIL

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Rev. July 2025
Engineer Job No. 14-203.R1

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OWNER: THE CITY OF BRUNDIDGE
LOCATION: BRUNDIDGE, ALABAMA
PROJECT: CONTRACT 1 – TREATMENT AND COLLECTION SYSTEM IMPROVEMENTS
CWSRF NO. CS010864-02
SEID23AL001

Sealed Bids for the construction of Contract 1 – Treatment and Collection System Improvements – CWSRF No. CS010864-02 and SEID23AL001 will be received by the City of Brundidge at the City Hall Council Chambers, 200 N. Main St., Brundidge, Alabama 36010, until 10:00 a.m. local time on Thursday, August 28, 2025, at which time the Bids received will be publicly opened and read. The Project consists of the replacement of approximately 760 feet of 8" gravity sewer and improvements to three wastewater pumping stations which are part of the sewage collection system plus various improvements at the Wastewater Treatment Facility including a new return sludge pumping station, upgrade to the existing utility pumping station and yard piping improvements.

Bids will be received for a single prime Contract. Bids shall be on a lump sum and/or unit price basis as indicated in the Bid Form.

Information and Bidding Documents for the Project can be found at the following designated website: https://poly-inc.com/bidsite. Bidding Documents may be downloaded from the designated website at no cost. All official notifications, addenda, and other Bidding Documents will be offered only through the designated website. Neither Owner nor Engineer will be responsible for Bidding Documents, including addenda, if any, obtained from sources other than the designated website.

The Issuing Office for the Bidding Documents is Poly, Inc., 1935 Headland Avenue, Dothan, AL 36303, 334-793-4700, Max Mobley, mmobley@poly-inc.com. Prospective Bidders may obtain or examine the Bidding Documents at the Issuing Office on Monday through Thursday between the hours of 8:00 am to 5:00 pm and on Friday from 8:00 am to 11:30 pm, and may obtain copies of the Bidding Documents from the Issuing Office as described below. Partial sets of Bidding Documents will not be available.

Bidding Documents also may be examined at the Brundidge City Hall, 200 N. Main St., Brundidge, AL 36010, on Monday through Friday between the hours of 8:00 a.m. and 4:00 p.m., local time.

Printed copies of the Bidding Documents may be obtained from the Issuing Office by paying a deposit of $130.00 for each set plus shipping as applicable. Bidders who return full sets of the Bidding Documents in good condition within 10 days after receipt of Bids will receive a full refund minus shipping charges. Non-Bidders, and Bidders who obtain more than one set of the Bidding Documents, will receive a refund less the cost of printing, reproduction, handling, and distribution for documents returned in good condition within the time limit indicated above.

No Bidding Documents will be issued within 72 hours of the scheduled date and time of the Bid Opening.

A Pre-bid Meeting will be held on Friday, August 15, 2025, 10:00 a.m., local time, at the Brundidge City Hall, 200 N. Main St., Brundidge, Alabama 36010. Bidder's attendance is not required but encouraged.

Bid security shall be furnished in accordance with the Instructions to Bidders.

All Bidders bidding in amounts exceeding that established by the State Licensing Board for General Contractors must be licensed under the provisions of Title 34, Chapter 8, Code of Alabama, 1975, and must show evidence of license before bidding or Bid will not be received or considered by the Owner. The

Bidder shall show evidence by including its current license number during registration and clearly displaying on the outside of the sealed envelope in which the Bid is delivered.

The Owner reserves the right to reject any and all Bids and to waive technical errors if, in the Owner's judgment, the best interest of the Owner will thereby be promoted. The Owner further reserves the right to negotiate price and time with the low bidder.

For all further requirements regarding bid submittal, qualifications, procedures, and contract award, refer to the Instructions to Bidders that are included in the Bidding Documents.

OWNER: CITY OF BRUNDIDGE
BY: ISABELL BOYD, MAYOR

END OF SECTION 00 11 13

SECTION 00 21 13 – INSTRUCTIONS TO BIDDERS

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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). 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 and/or Engineer 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 10.0 or later. It is the intent of the Engineer and Owner that such Electronic Documents are to be exactly representative of

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

B. Unless otherwise stated in the Bidding Documents, the Bidder may use and rely upon complete sets of Electronic Documents of the Bidding Documents, described in Paragraph 2.06.A above. However, Bidder assumes all risks associated with differences arising from transmission/receipt of Electronic Documents versions of Bidding Documents and reproductions prepared from those versions and, further, assumes all risks, costs, and responsibility associated with use of the Electronic Documents versions to derive information that is not explicitly contained in printed paper versions of the documents, and for Bidder's reliance upon such derived information.

C. After the Contract is awarded, the Owner may provide or direct the Engineer to provide for the use of the Contractor certain documents that were developed by Engineer as part of the Project design process, as Electronic Documents in native file formats.

1. Release of such documents will be solely for the convenience of the Contractor. No such document is a Contract Document.

2. Unless the Contract Documents explicitly identify that such information will be available to the Successful Bidder (Contractor), nothing herein will create an obligation on the part of the Owner or Engineer to provide or create such information, and the Contractor is not entitled to rely on the availability of such information in the preparation of its Bid or pricing of the Work. In all cases, the Contractor shall take appropriate measures to verify that any electronic/digital information provided in Electronic Documents is appropriate and adequate for the Contractor's specific purposes.

3. In no case will the Contractor be entitled to additional compensation or time for completion due to any differences between the actual Contract Documents and any related document in native file format.

ARTICLE 3—QUALIFICATIONS OF BIDDERS

3.01 If the Bid amount is $50,000 or greater, any contractor must be licensed by the State of Alabama General Contractor's Licensing Board in order to be allowed to bid. Any such Bid received by a Bidder which does not have the required contractor's license will not be considered.

3.02 To demonstrate Bidder's qualifications to perform the Work, after submitting its Bid and within 5 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.

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

3.04 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

4.1 A non-mandatory pre-bid conference will be held at the time and location indicated in the Advertisement. Representatives of Owner and Engineer will be present to discuss the Project. Bidders are encouraged to attend and participate in the conference; however, attendance at this conference is not required to submit a Bid.

4.02 Information presented at the pre-bid conference does not alter the Contract Documents. Owner will issue Addenda to make any changes to the Contract Documents that result from discussions at the pre-bid conference. Information presented, and statements made at the pre-bid conference will not be binding or legally effective unless incorporated in an Addendum.

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

5.01 *Site and Other Areas*

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

5.02 *Existing Site Conditions*

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

1. The Supplementary Conditions identify the following regarding existing conditions at or adjacent to the Site:

a. Those reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data.

b. Those drawings known to Owner of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data.

c. Reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site.

d. Technical Data contained in such reports and drawings.

2. Owner will make copies of reports and drawings referenced above available to any Bidder on request. These reports and drawings are not part of the Contract Documents, but the Technical Data contained therein upon whose accuracy Bidder is entitled to rely, as provided in the General Conditions, has been identified and established in the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion

Bidder draws from any Technical Data or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.

3. If the Supplementary Conditions do not identify Technical Data, the default definition of Technical Data set forth in Article 1 of the General Conditions will apply.

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

5.03 *Other Site-related Documents*

A. 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. Bidders visiting the Site are required to arrange their own transportation to the Site.

C. All access to the Site other than during a regularly scheduled Site visit must be coordinated through the following Owner or Engineer. Bidder must conduct the required Site visit during normal working hours.

D. Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.

E. 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.

F. 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.

G. Bidder must fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.

5.05 *Owner's Safety Program*

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

5.06 *Other Work at the Site*

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

ARTICLE 6—BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

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

A. The Bid Form that each Bidder will submit contains express representations regarding the Bidder's examination of Project documentation, Site visit, and preparation of the Bid, and certifications regarding lack of collusion or fraud in connection with the Bid. Bidder should review these representations and certifications, and assure that Bidder can make the representations and certifications in good faith, before executing and submitting its Bid.

B. If Bidder is awarded the Contract, Bidder (as Contractor) will make similar express representations and certifications when it executes the Agreement.

ARTICLE 7—INTERPRETATIONS AND ADDENDA

7.01 Owner on its own initiative may issue Addenda to clarify, correct, supplement, or change the Bidding Documents.

7.02 Bidder shall submit all questions about the meaning or intent of the Bidding Documents to Engineer in writing. Contact information and submittal procedures for such questions are as follows:

A. Submit via email to Max Mobley, Poly, Inc., mmobley@poly-inc.com .

7.03 Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda delivered to all registered plan holders. Questions received less than seven days prior to the date for opening of Bids may not be answered.

7.04 Only responses set forth in an Addendum will be binding. Oral and other interpretations or clarifications will be without legal effect. Responses to questions are not part of the Contract

Documents unless set forth in an Addendum that expressly modifies or supplements the Contract Documents.

ARTICLE 8—BID SECURITY

8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of 5 percent of Bidder's maximum Bid price (determined by adding the base bid and all alternates), but in no event shall be more than $10,000. The Bid security shall be in the form of a Bid bond issued by a surety meeting the requirements of Paragraph 6.01 of the General Conditions. Such Bid bond will be issued in the form included in the Bidding Documents.

8.02 The Bid security of the apparent Successful Bidder will be retained until Owner awards the contract to such Bidder, and such Bidder has executed the Contract, furnished the required Contract security, and met the other conditions of the Notice of Award, whereupon the Bid security will be released. If the Successful Bidder fails to execute and deliver the Contract and furnish the required Contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited, in whole in the case of a penal sum bid bond, and to the extent of Owner's damages in the case of a damages-form bond. Such forfeiture will be Owner's exclusive remedy if Bidder defaults.

8.03 The Bid security of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of 7 days after the Effective Date of the Contract or 61 days after the Bid opening, whereupon Bid security furnished by such Bidders will be released.

8.04 Bid security of other Bidders that Owner believes do not have a reasonable chance of receiving the award will be released within 7 days after the Bid opening.

ARTICLE 9—CONTRACT TIMES

9.01 The number of days within which, or the dates by which, the Work is to be (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 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 The Contract for the Work, as awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents, and those "or-equal" or substitute or materials and equipment subsequently approved by Engineer prior to the submittal of Bids and identified by Addendum. No item of material or equipment will be considered by Engineer as an "or-equal" or substitute unless written request for approval has been submitted by Bidder and has been received by Engineer within 10 days of the issuance of the Advertisement for Bids or invitation to Bidders. Each such request must comply with the requirements of Paragraphs 7.05 and 7.06 of the General Conditions, and the review of the request will be governed by the principles in those paragraphs. The burden of proof of the merit of the proposed item is upon Bidder. Engineer's decision of approval or disapproval of a proposed item will be final. If Engineer approves any such

proposed item, such approval will be set forth in an Addendum issued to all registered Bidders. Bidders cannot rely upon approvals made in any other manner.

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

ARTICLE 11—SUBCONTRACTORS, SUPPLIERS, AND OTHERS

11.01 A Bidder must be prepared to retain specific Subcontractors and Suppliers for the performance of the Work if required to do so by the Bidding Documents or in the Specifications. If a prospective Bidder objects to retaining any such Subcontractor or Supplier and the concern is not relieved by an Addendum, then the prospective Bidder should refrain from submitting a Bid.

11.02 The apparent Successful Bidder, and any other Bidder so requested, must submit to Owner a list of the Subcontractors or Suppliers proposed for the Work within five days after Bid opening.

11.03 If requested by Owner, such list must be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor or Supplier. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor or Supplier, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit an acceptable substitute, in which case apparent Successful Bidder will submit a substitute, Bidder's Bid price will be increased (or decreased) by the difference in cost occasioned by such substitution, and Owner may consider such price adjustment in evaluating Bids and making the Contract award.

11.04 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors and Suppliers. Declining to make requested substitutions will constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor or Supplier, so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to subsequent revocation of such acceptance as provided in Paragraph 7.07 of the General Conditions.

ARTICLE 12—PREPARATION OF BID

12.01 The Bid Form is included with the Bidding Documents.

A. All blanks on the Bid Form must be completed 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 for each item of Work listed in the lump sum section of the Bid Form.

13.02 *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.

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" including Bid Number, Bid Opening Date, Project Title, and General Contractor's License Number. A mailed Bid must be addressed to **ATTN: CITY CLERK, CITY OF BRUNDIDGE, 200 N. MAIN ST. (P.O. BOX 638), BRUNDIDGE, AL 36010**.

14.03 Contractors must be licensed under the provisions of **Title 34, Chapter 8, Code of Alabama, 1975**, and must show evidence of license before bidding or bid will not be received or considered by the Owner; the bidder shall show such evidence by clearly displaying its current license number on the outside of the sealed envelope in which the proposal is delivered.

14.04 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened.

ARTICLE 15—MODIFICATION AND WITHDRAWAL OF BID

15.01 An unopened Bid may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.

15.02 If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 15.01 and submit a new Bid prior to the date and time for the opening of Bids.

15.03 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, the Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid, the Bidder will be disqualified from further bidding on the Work.

ARTICLE 16—OPENING OF BIDS

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

ARTICLE 17—BIDS TO REMAIN SUBJECT TO ACCEPTANCE

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

ARTICLE 18—EVALUATION OF BIDS AND AWARD OF CONTRACT

18.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner also reserves the right to waive all minor Bid informalities not involving price, time, or changes in the Work.

18.02 Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible.

18.03 If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, whether in the Bid itself or in a separate communication to Owner or Engineer, then Owner will reject the Bid as nonresponsive.

18.04 More than one Bid for the same Work from an individual or entity under the same or different names will not be considered. Reasonable grounds for believing that any Bidder has an interest in more than one Bid for the Work may be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder has an interest.

18.05 If Owner awards the contract for the Work, such award will be to the responsible Bidder submitting the lowest responsive Bid.

18.06 *Evaluation of Bids*

A. In evaluating Bids, Owner will consider whether the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.

B. 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.

C. When alternates are included in the Bid, the apparent low Bidder will be determined per Paragraph 18.06.B for the base Bid. After determination of the Successful Bidder based 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 and/or deductive alternate Bids for which Owner determines funds will be available at the time of award.

18.07 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.

18.08 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—ALABAMA IMMIGRATION LAW, HB56 (E-VERIFY)

21.01 The Alabama Immigration Law, HB56, prohibits employers from knowingly hiring illegal workers. The Successful Bidder shall only employ individuals who may legally work in the United States either U.S. citizens or foreign citizens who are authorized to work in the U.S. The Successful Bidder shall use the U.S. Department of Homeland Security's E-Verify Employment Eligibility Verification System (http://www.uscis.gov/portal/site/uscis) to verify the employment eligibility of:

A. All persons employed during the term of this Agreement with the Owner, to perform employment duties within Alabama; and

B. All persons (including subcontractors and subrecipients) assigned to perform work pursuant to the agreement with the Owner.

21.02 The Successful Bidder shall include this provision in all subcontracts/subgrants it enters into for the performance of work under Agreement with the Owner. The Successful Bidder shall further execute a Certification of Compliance with this provision along with the other contract documents to include providing documentation that the Contractor is enrolled in the E-Verify Program.

21.03 The certification form is included in Section 00 41 00 as an attachment. It shall be included with submission of the Bid.

21.04 The Bidder shall submit the E-Verify MOU for Employer with the Bid.

ARTICLE 22—SALES AND USE TAXES

22.01 Refer to Supplementary Condition SC 7.10.

22.02 Refer to Article 3 of the Bid Form. The Bidder shall not include in the prices bid the sales and use tax on products which are exempt from sales and use tax.

22.03 Prior to Bid Award, the apparent low Bidder shall provide to the Owner all information needed for the completion of its application (Form ST: EXC-01) for a sales and use tax certificate of exemption for the Project. Such information includes, but is not limited to the following:

A. Total labor, not including overhead and profit.

B. Total materials, not including overhead and profit.

C. Anticipated Project start date and completion date.

D. Whether the Contractor anticipates use of subcontractors.

E. Whether the Contractor anticipates any pollution control exemption being applicable, and if so, to what extent, including estimated pollution control costs.

22.04 Failure of the apparent low Bidder to provide the information in a timely manner may delay its ability to purchase materials on a tax exempt basis; therefore, its anticipated Project start date may be affected.

SECTION 00 41 00 – BID FORM

BID FORM

Project Title:	Contract 1 – Treatment and Collection System Improvements
Project Location:	Brundidge, Alabama
Owner:	City of Brundidge
Agency Project No.:	CS010864-02
Owner Project or Bid No.:	CS010864-02
Engineer Project No.:	14-203.R1
Bid Opening Location:	Brundidge City Hall Council Chambers 200 N. Main St. Brundidge, Alabama 36010
Bid Opening Date:	

SUBMITTED BY

Bidder Name:	
Bidder Address:	

ARTICLE 1 – OWNER AND BIDDER

1.01 This Bid is submitted to:

City of Brundidge
200 N. Main St.
Brundidge, Alabama 36010

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 – ATTACHMENTS TO THIS BID

2.01 The following documents are submitted with and made a condition of this Bid:

A. Required Bid security;

B. E-Verify MOU for Employers;

C. Contractor's License Certification;

D. HB56 Compliance Certification;

E. EPA Form 6100-3 DBE Subcontractor Performance Form

F. EPA Form 6100-4 DBE Subcontractor Utilization Form

G. Certification Regarding Equal Employment Opportunity

H. Debarred Firms Certification

I. List of Proposed Subcontractors;

J. List of Proposed Suppliers;

K. List of Project References;

L. Required Bidder Qualification Statement with supporting data.

ARTICLE 3 – BASIS OF BID

3.01 *Lump Sum and Unit Price Bids*

A. Bidder will complete the Work in accordance with the Contract Documents for the following lump sum (stipulated) price(s), together with any Unit Prices:

The Bidder shall not include in the prices bid the sales and use tax on products which are exempt from sales and use tax.

ITEM NO.	EST. QTY & UNIT	DESCRIPTION	UNIT PRICE	TOTAL PRICE
SECTION A. ARPA ELIGIBLE				
A1.	LUMP SUM	Contractor Mobilization/Demobilization, Including Bonds, Insurance, Project Closeout And All Incidentals, Complete For The Lump Sum Price Of	$ LUMP SUM	$ _____
A2.	LUMP SUM	Refurbishing The Armory Pump Station Including New Pumps, Controls, Concrete Slab, Wet Well Hatch, Fence Repair, And All Incidentals, Complete For The Lump Sum Price Of	$ LUMP SUM	$ _____
A3.	LUMP SUM	Refurbishing The Allen Road Pump Station Including New Pumps, Controls, Concrete Slab, Fence, Wet Well Hatch, Discharge Pipe Within The Limits Shown And All Incidentals, Complete For The Lump Sum Price Of	$ LUMP SUM	$ _____
A4.	LUMP SUM	Refurbishing The Tennile Road Pump Station Including New Pumps, Controls, Concrete Slab, Fence Repair, And All Incidentals, Complete For The Lump Sum Price Of	$ LUMP SUM	$ _____
A5.	LUMP SUM	New Return Sludge (RAS) Pumping Station Including New Influent Piping, Valves and Manholes, Pumps, Controls, Concrete Work, Discharge Piping and Valves, Return Sludge Force Main, Handrails, Hatches, Vault And All Incidentals, Complete For The Lump Sum Price Of	$ LUMP SUM	$ _____
A6.	LUMP SUM	Refurbishing The Existing Recirculation Pumping Station Complete Including New Pumps, Controls, Concrete Slab, Discharge Piping, Valves, And All Incidentals Not Included In Other Pay Items For The Lump Sum Price Of	$ LUMP SUM	$ _____
A7.	LUMP SUM	Yard Piping Modifications At Existing Manhole No. 1 To Include All Pipe, Fittings, And All Incidentals, Complete For The Lump Sum Price Of	$ LUMP SUM	$ _____

ITEM NO.	EST. QTY & UNIT	DESCRIPTION	UNIT PRICE	TOTAL PRICE
A8.	LUMP SUM	All Demolition At The WWTF, Including The Recirculation Pumping Station, And Any Other Facilities/Structures As Called Out On The Drawings Or In Conflict With New Construction, Complete For The Lump Sum Price Of	$ LUMP SUM	$
A9.	215 L.F.	Remove Existing Asphalt Pavement At The WWTF And Replace With Crushed Stone Patch, Complete In Place For	$ /L.F.	$
A10.	100 L.F.	Silt Fence, Complete In Place For	$ /L.F.	$
A11.	10 EA.	Hay Bales, Complete In Place For	$ /EA.	$
A12.	0.5 AC.	Seeding And Mulching, Complete In Place For	$ /AC.	$

TOTAL SECTION A. ARPA ELIGIBLE $ _____

ITEM NO.	EST. QTY & UNIT	DESCRIPTION	UNIT PRICE	TOTAL PRICE
SECTION B. ARPA INELIGIBLE				
B1.	340 L.F.	8" PVC Sanitary Sewer 0/6' Cut, Complete In Place For	$ /L.F.	$
B2.	230 L.F.	8" PVC Sanitary Sewer 6/8' Cut, Complete In Place For	$ /L.F.	$
B3.	190 L.F.	8" PVC Sanitary Sewer 8/10' Cut, Complete In Place For	$ /L.F.	$
B4.	2 EA.	48" Sewer Manholes With Frame And Cover 0/6' Depth, Complete In Place For	$ /EA.	$
B5.	1 EA.	48" Sewer Manholes With Frame And Cover 6/8' Depth, Complete In Place For	$ /EA.	$
B6.	1 V.F.	Vertical Feet of Manholes Over 8' Depth, Complete In Place For	$ /V.F.	$
B7.	LUMP SUM	Remove And Replace Existing Drop Connection At Manhole MHS-1, Complete For The Lump Sum Price Of	$ LUMP SUM	$
B8.	10 EA.	8 x 4 Wyes, Complete In Place For	$ /EA.	$
B9.	180 L.F.	4" PVC Lateral Pipe, Complete In Place For	$ /L.F.	$
B10.	10 EA.	4" Service Transfers, Complete In Place For	$ /EA.	$
B11.	2 EA.	Manhole Abandonments On Nassau Street Including Partial Demolition, Disposal, And Filling, Complete In Place For	$ /EA.	$
B12.	21 V.F.	Manhole Walls Reconditioned, Complete In Place For	$ /V.F.	$
B13.	750 L.F.	Temporary Asphalt Patch Ahead Of Full Width Resurfacing Including Placement And Maintenance Of 8" Crushed Stone And All Incidentals, Complete In Place For	$ /L.F.	$
B14.	LUMP SUM	Traffic Control On Ala. Hwy. 10, Nassau St. And Lawson St., Complete For The Lump Sum Price Of	$ LUMP SUM	$
B15.	LUMP SUM	Bypass Pumping On Lawson St. Below Manhole 2A, Complete For The Lump Sum Price Of	$ LUMP SUM	$

ITEM NO.	EST. QTY & UNIT	DESCRIPTION	UNIT PRICE	TOTAL PRICE
B16.	20 C.Y.	Select Foundation Material, Complete In Place For	$ _____ /C.Y.	$ _____
B17.	20 C.Y.	Select Backfill, Complete In Place For	$ _____ /C.Y.	$ _____

TOTAL SECTION B. ARPA INELIGIBLE $ _____

TOTAL PRICE BID – SECTIONS A AND B $ _____

TOTAL BID AMOUNT IS _____

_____ DOLLARS AND _____ CENTS.
(Amounts are to be shown in both words and figures. In case of discrepancy, the amount shown in words will govern.)

B. Bidder acknowledges that:

1. 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

2. 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 – TIME OF COMPLETION

4.01 Bidder agrees that the Work will be substantially complete within **240** calendar days after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions, and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within **270** calendar days after the date when the Contract Times commence to run.

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

ARTICLE 5 – BIDDER'S ACKNOWLEDGEMENTS: ACCEPTANCE PERIOD, INSTRUCTIONS, AND RECEIPT OF ADDENDA

5.01 *Bid Acceptance Period*

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

5.02 *Instructions to Bidders*

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

5.03 *Receipt of Addenda*

A. Bidder hereby acknowledges receipt of the following Addenda:

Addendum Number & Date	Addendum Number & Date

ARTICLE 6 – BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

6.01 *Bidder's Representations*

A. In submitting this Bid, Bidder represents the following:

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

discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.

10. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

11. The submission of this Bid constitutes an incontrovertible representation by Bidder that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

6.02 *Bidder's Certifications*

A. The Bidder certifies the following:

1. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation.

2. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid.

3. Bidder has not solicited or induced any individual or entity to refrain from bidding.

4. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 6.02.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.: _____

ATTACHMENT – CONTRACTOR'S LICENSE CERTIFICATION

Bidder/Contractor's Name: _____

Alabama Contractor's License Number: _____

Alabama Contractor's License Classification: _____

Alabama Contractor's License Bid Limit: _____

Expiration Date of License: _____

I certify that the above information is true and correct and that the classification noted is applicable to the Bid for this Project.

BIDDER: _____

By: _____
(name signed)

_____
(name printed or typed)

Title: _____

Date: _____

ATTACHMENT – COMPLIANCE CERTIFICATION (HB56)

(To be completed as a condition for the award of any contract, grant, or incentive by the State of Alabama, any political subdivision thereof, or any state-funded entity or employer that employs one or more employees)

State of _____

County of _____

Before me, a notary public, personally appeared _____

(print name) who, being duly sworn, says as follows:

As a condition for the award of any contract, grant, or incentive by the State of Alabama, any political subdivision thereof, or any state-funded entity to a business entity or employer that employs one or more employees, I hereby attest that my capacity as _____ (state position) for _____ (state business entity/employer/contractor name) that said business entity/employer/contractor shall not knowingly employ, hire for employment, or continue to employ any unauthorized alien.

I further attest said business entity/employer/contractor is enrolled in the E-Verify program. (ATTACH DOCUMENTATION ESTABLISHING THAT BUSINESS ENTITY/EMPLOYER/CONTRACTOR IS ENROLLED IN THE E-VERIFY PROGRAM)

_____ Signature of Affiant

Sworn to and subscribed before me this _____ day of _____, _____.

I certify that the affiant is known (or made known) to me to be the identical party he or she claims to be.

_____ Signature and Seal of Notary Public

Author: Jean Brown
Statutory Authority: Code of Alabama, sections 31-13-9 (a) and (b); Section 31-13-9 (h).
History: New Rule: Filed December 12, 2011; effective December 12, 2011

820-4-1.02ER Contents of Acceptable Affidavit Form For Administering Code of Alabama, Section 31-13-9 (c).

ATTACHMENT – EPA FORM 6100-3 DBE SUBCONTRACTOR PERFORMANCE FORM

IX - EPA Form 6100-3 DBE Subcontractor Performance Form

EPA United States Environmental Protection Agency

OMB Control No: 2090-0030

Disadvantaged Business Enterprise (DBE) Program
DBE Subcontractor Performance Form

This form is intended to capture the DBE[1] subcontractor's[2] description of work to be performed and the price of the work submitted to the prime contractor. An EPA Financial Assistance Agreement Recipient must require its prime contractor to have its DBE subcontractors complete this form and include all completed forms in the prime contractors bid or proposal package.

Subcontractor Name		Project Name
Bid/ Proposal No.	Assistance Agreement ID No. (if known)	Point of Contact
Address		
Telephone No.		Email Address
Prime Contractor Name		Issuing/Funding Entity:

Contract Item Number	Description of Work Submitted to the Prime Contractor Involving Construction, Services, Equipment or Supplies	Price of Work Submitted to the Prime Contractor
DBE Certified By: O DOT O SBA O Other: _____	Meets/ exceeds EPA certification standards? O YES O NO O Unknown	

[1] A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.205 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

[2] Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an EPA award of financial assistance.

EPA FORM 6100-3 (DBE Subcontractor Performance Form)

IX - EPA Form 6100-3 DBE Subcontractor Performance Form

EPA United States Environmental Protection Agency

OMB Control No: 2090-0030

Disadvantaged Business Enterprise (DBE) Program
DBE Subcontractor Performance Form

I certify under penalty of perjury that the forgoing statements are true and correct. Signing this form does not signify a commitment to utilize the subcontractors above. I am aware of that in the event of a replacement of a subcontractor, I will adhere to the replacement requirements set forth in 40 CFR Part 33 Section 33.302 (c).

Prime Contractor Signature	Print Name
Title	**Date**

Subcontractor Signature	Print Name
Title	**Date**

The public reporting and recordkeeping burden for this collection of information is estimated to average three (3) hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed form to this address.

EPA FORM 6100-3 (DBE Subcontractor Performance Form)

ATTACHMENT – EPA FORM 6100-4 DBE SUBCONTRACTOR UTILIZATION FORM

X - EPA Form 6100-4 DBE Subcontractor Utilization Form

EPA United States Environmental Protection Agency

OMB Control No: 2090-0030

Disadvantaged Business Enterprise (DBE) Program
DBE Subcontractor Utilization Form

This form is intended to capture the prime contractor's actual and/or anticipated use of identified certified DBE[1] subcontractors[2] and the estimated dollar amount of each subcontract. An EPA Financial Assistance Agreement Recipient must require its prime contractors to complete this form and include it in the bid or proposal package. Prime contractors should also maintain a copy of this form on file.

Prime Contractor Name		Project Name
Bid/ Proposal No.	Assistance Agreement ID No. (if known)	Point of Contact
Address		
Telephone No.		Email Address
Issuing/Funding Entity:		

I have identified potential DBE certified subcontractors	○ YES	⊙ NO
If yes, please complete the table below. If no, please explain:		

Subcontractor Name/ Company Name	Company Address/ Phone/ Email	Est. Dollar Amt	Currently DBE Certified?

Continue on back if needed

[1] A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.205 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

[2] Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an EPA award of financial assistance.

EPA FORM 6100-4 (DBE Subcontractor Utilization Form)

X - EPA Form 6100-4 DBE Subcontractor Utilization Form

EPA United States Environmental Protection Agency

OMB Control No: 2090-0030

Disadvantaged Business Enterprise (DBE) Program
DBE Subcontractor Utilization Form

I certify under penalty of perjury that the forgoing statements are true and correct. Signing this form does not signify a commitment to utilize the subcontractors above. I am aware of that in the event of a replacement of a subcontractor, I will adhere to the replacement requirements set forth in 40 CFR Part 33 Section 33.302 (c).

Prime Contractor Signature	Print Name
Title	**Date**

The public reporting and recordkeeping burden for this collection of information is estimated to average three (3) hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed form to this address.

EPA FORM 6100-4 (DBE Subcontractor Utilization Form)

ATTACHMENT – CERTIFICATION REGARDING EQUAL EMPLOYMENT OPPORTUNITY

XIII – Certification Regarding Equal Employment Opportunity

The prime contractor is required to comply with Executive Order 112-46 of September 24, 1965 entitled "Equal Employment Opportunity" as amended by Executive Order 11375 of October 13, 1967.

The contract for the work under this proposal will obligate the prime contractor and its subcontractors not to discriminate in employment practices.

The prime contractor shall not maintain or provide for his/her employees the facilities, which are segregated on a basis of race, creed, color or national origin, whether such facilities are segregated by directive or on a de facto basis.

The prime contractor must, if requested, submit a compliance report concerning their employment practices and policies in order to maintain his/her eligibility to receive the award of the contract.

The prime contractor must be prepared to comply in all respects with any contract provisions regarding non-discrimination stipulated in conjunction with labor standards.

PRIME CONTRACTOR'S CERTIFICATION:

Prime Contractor's Name: _____

Address: _____

_____

_____

1. Bidder has participated in a previous contract or subcontract subject to the Equal Opportunity Clause. Yes____ No____
2. Compliance Reports were required to be filed in connection with such contract or subcontract. Yes____ No____
3. Bidder has filed all compliance reports due under applicable contract requirements. Yes____ No____

If answer to item 3 is "No", please explain in detail on reverse side of this certification.

Certification - The information above is true and complete to the best of my knowledge and belief.

Signature of Prime Contractor: _____

Title: _____

Date: _____

ATTACHMENT – DEBARRED FIRMS CERTIFICATION

XIV – Debarred Firms Certification

All prime construction contractors shall certify that Subcontracts have not and will not be awarded to any firm that is currently on the General Service Administration's Master List of Debarred, Suspended and Voluntarily Excluded Persons, in accordance with the provisions of ADEM Administrative Code 335-6-14-.35. Debarment action is taken against a firm for noncompliance with Federal Law.

All bidders shall complete this certification in duplicate and submit both copies to the Loan Recipient (Owner) with the bid proposal. The Loan Recipient (Owner) shall transmit one copy to the SRF Section within 14 days after the bid opening.

Project Name/Loan Name*: _____
(*not **Contract** Name)

SRF Project No.: _____

The undersigned hereby certifies that the firm of _____

_____ has not and will not award a subcontract, in connection with any contract awarded to it as the result of this bid, to any firm that is currently on the General Service Administration's Master List of Debarred, Suspended, and Voluntarily Excluded Persons.

Signature of Prime Contractor: _____

Title: _____

Date: _____

END OF SECTION 00 41 00

SECTION 00 43 13 – BID BOND

Bidder Name: Address *(principal place of business)*:	**Surety** Name: Address *(principal place of business)*:
Owner Name: City of Brundidge Address *(principal place of business)*: 200 N. Main St. P.O. Box 638 Brundidge, AL 36010	**Bid** Project *(name and location)*: Contract 1 – Treatment and Collection System Improvements / CWSRF No. CS010864-02 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
(Full formal name of Bidder)	*(Full formal name of Surety) (corporate seal)*
By: _____ *(Signature)*	By: _____ *(Signature) (Attach Power of Attorney)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____
Attest: _____ *(Signature)*	Attest: _____ *(Signature)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title:	Title:

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.

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.

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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 SECTION 00 43 13

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SECTION 00 45 13 – BIDDER QUALIFICATION STATEMENT

ARTICLE 1—GENERAL INFORMATION

1.01 Provide contact information for the Business:

Legal Name of Business:			
Corporate Office			
Name:		Phone number:	
Title:		Email address:	
Business address of corporate office:			
Local Office			
Name:		Phone number:	
Title:		Email address:	
Business address of local office:			

1.02 Provide information on the Business's organizational structure:

Form of Business:	☐ Sole Proprietorship ☐ Partnership ☐ Corporation		
☐ Limited Liability Company ☐ Joint Venture comprised of the following companies:			
	1.		
	2.		
	3.		
Provide a separate Qualification Statement for each Joint Venturer.			
Date Business was formed:		State in which Business was formed:	
Is this Business authorized to operate in the Project location?	☐ Yes ☐ No ☐ Pending		

1.03 Identify all businesses that own Business in whole or in part (25% or greater), or that are wholly or partly (25% or greater) owned by Business:

Name of business:		Affiliation:	
Address:			
Name of business:		Affiliation:	
Address:			
Name of business:		Affiliation:	

Address:	

1.04 Provide information regarding the Business's officers, partners, and limits of authority.

Name:		Title:	
Authorized to sign contracts: ☐ Yes ☐ No		Limit of Authority:	$
Name:		Title:	
Authorized to sign contracts: ☐ Yes ☐ No		Limit of Authority:	$
Name:		Title:	
Authorized to sign contracts: ☐ Yes ☐ No		Limit of Authority:	$
Name:		Title:	

ARTICLE 2—LICENSING

2.01 Provide information regarding licensure for Business:

Name of License:			
Licensing Agency:			
License No:		Expiration Date:	
Name of License:			
Licensing Agency:			
License No:		Expiration Date:	

ARTICLE 3—DIVERSE BUSINESS CERTIFICATIONS

3.01 Provide information regarding Business's Diverse Business Certification, if any. Provide evidence of current certification.

Certification	Certifying Agency	Certification Date
☐ Disadvantaged Business Enterprise		
☐ Minority Business Enterprise		
☐ Woman-Owned Business Enterprise		
☐ Small Business Enterprise		
☐ Disabled Business Enterprise		
☐ Veteran-Owned Business Enterprise		
☐ Service-Disabled Veteran-Owned Business		
☐ HUBZone Business (Historically Underutilized) Business		
☐ Other		
☐ None		

ARTICLE 4—SAFETY

4.01 Provide information regarding Business's safety organization and safety performance.

Name of Business's Safety Officer:		
Safety Certifications		
Certification Name	Issuing Agency	Expiration

4.02 Provide Worker's Compensation Insurance Experience Modification Rate (EMR), Total Recordable Frequency Rate (TRFR) for incidents, and Total Number of Recorded Manhours (MH) for the last 3 years and the EMR, TRFR, and MH history for the last 3 years of any proposed Subcontractor(s) that will provide Work valued at 10% or more of the Contract Price. Provide documentation of the EMR history for Business and Subcontractor(s).

Year									
Company	EMR	TRFR	MH	EMR	TRFR	MH	EMR	TRFR	MH

ARTICLE 5—FINANCIAL

5.01 Provide information regarding the Business's financial stability. Provide the most recent audited financial statement, and if such audited financial statement is not current, also provide the most current financial statement.

Financial Institution:		
Business address:		
Date of Business's most recent financial statement:		☐ Attached
Date of Business's most recent audited financial statement:		☐ Attached
Financial indicators from the most recent financial statement		
Contractor's Current Ratio (Current Assets ÷ Current Liabilities)		
Contractor's Quick Ratio ((Cash and Cash Equivalents + Accounts Receivable + Short Term Investments) ÷ Current Liabilities)		

ARTICLE 6—SURETY INFORMATION

6.01 Provide information regarding the surety company that will issue required bonds on behalf of the Business, including but not limited to performance and payment bonds.

Surety Name:	

Surety is a corporation organized and existing under the laws of the state of:			
Is surety authorized to provide surety bonds in the Project location?	☐ Yes ☐ No		
Is surety listed in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" published in Department Circular 570 (as amended) by the Bureau of the Fiscal Service, U.S. Department of the Treasury? ☐ Yes ☐ No			
Mailing Address (principal place of business):			
Physical Address (principal place of business):			
Phone (main):		Phone (claims):	

ARTICLE 7—INSURANCE

7.01 Provide information regarding Business's insurance company(s), including but not limited to its Commercial General Liability carrier. Provide information for each provider.

Name of insurance provider, and type of policy (CLE, auto, etc.):			
Insurance Provider		Type of Policy (Coverage Provided)	
Are providers licensed or authorized to issue policies in the Project location?		☐ Yes ☐ No	
Does provider have an A.M. Best Rating of A-VII or better?		☐ Yes ☐ No	
Mailing Address (principal place of business):			
Physical Address (principal place of business):			
Phone (main):		Phone (claims):	

ARTICLE 8—CONSTRUCTION EXPERIENCE

8.01 Provide information that will identify the overall size and capacity of the Business.

Average number of current full-time employees:	
Estimate of revenue for the current year:	
Estimate of revenue for the previous year:	

8.02 Provide information regarding the Business's previous contracting experience.

Years of experience with projects like the proposed project:				
As a general contractor:		As a joint venturer:		
Has Business, or a predecessor in interest, or an affiliate identified in Paragraph 1.03:				
Been disqualified as a bidder by any local, state, or federal agency within the last 5 years? ☐ Yes ☐ No				
Been barred from contracting by any local, state, or federal agency within the last 5 years? ☐ Yes ☐ No				
Been released from a bid in the past 5 years? ☐ Yes ☐ No				
Defaulted on a project or failed to complete any contract awarded to it? ☐ Yes ☐ No				
Refused to construct or refused to provide materials defined in the contract documents or in a change order? ☐ Yes ☐ No				
Been a party to any currently pending litigation or arbitration? ☐ Yes ☐ No				
Provide full details in a separate attachment if the response to any of these questions is Yes.				

8.03 List all projects currently under contract in Schedule A and provide indicated information.

8.04 List a minimum of three and a maximum of six projects completed in the last 5 years in Schedule B and provide indicated information to demonstrate the Business's experience with projects similar in type and cost of construction.

8.05 In Schedule C, provide information on key individuals whom Business intends to assign to the Project. Provide resumes for those individuals included in Schedule C. Key individuals include the Project Manager, Project Superintendent, Quality Manager, and Safety Manager. Resumes may be provided for Business's key leaders as well.

ARTICLE 9—REQUIRED ATTACHMENTS

9.01 Provide the following information with the Statement of Qualifications:

A. If Business is a Joint Venture, separate Qualifications Statements for each Joint Venturer, as required in Paragraph 1.02.

B. Diverse Business Certifications if required by Paragraph 3.01.

C. Certification of Business's safety performance if required by Paragraph 4.02.

D. Financial statements as required by Paragraph 5.01.

E. Attachments providing additional information as required by Paragraph 8.02.

F. Schedule A (Current Projects) as required by Paragraph 8.03.

G. Schedule B (Previous Experience with Similar Projects) as required by Paragraph 8.04.

H. Schedule C (Key Individuals) and resumes for the key individuals listed, as required by Paragraph 8.05.

I. Additional items as pertinent.

This Statement of Qualifications is offered by:

Business: _____
(typed or printed name of organization)

By: _____
(individual's signature)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Date: _____
(date signed)

(If Business 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)

Address for giving notices:

_____

_____

_____

Designated Representative:

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Address:

_____

_____

_____

Phone: _____

Email: _____

_____

Bidder's Contractor License No.: _____

Schedule A—Current Projects

Name of Organization					
Project Owner		Project Name			
General Description of Project					
Project Cost		Date Project			
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner		Project Name			
General Description of Project					
Project Cost		Date Project			
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner		Project Name			
General Description of Project					
Project Cost		Date Project			
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Schedule B—Previous Experience with Similar Projects

Name of Organization				
Project Owner		Project Name		
General Description of Project				
Project Cost		Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager
Name				

Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner		Project Name		
General Description of Project				
Project Cost		Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager
Name				

Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner		Project Name		
General Description of Project				
Project Cost		Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager
Name				

Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Schedule B—Previous Experience with Similar Projects

Name of Organization					
Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Schedule C—Key Individuals

Project Manager			
Name of individual			
Years of experience as project manager			
Years of experience with this organization			
Number of similar projects as project manager			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	

Project Superintendent			
Name of individual			
Years of experience as project superintendent			
Years of experience with this organization			
Number of similar projects as project superintendent			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	

Safety Manager			
Name of individual			
Years of experience as project manager			
Years of experience with this organization			
Number of similar projects as project manager			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	
Quality Control Manager			
Name of individual			
Years of experience as project superintendent			
Years of experience with this organization			
Number of similar projects as project superintendent			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	

END OF SECTION 00 45 13

SECTION 00 51 00 – NOTICE OF AWARD

NOTICE OF AWARD

Date of Issuance: _____

Owner: City of Brundidge Owner's Project No.: CS010864-02

Engineer: Poly, Inc. Engineer's Project No.: 14-203.R1

Project: 2022 Sewer Infrastructure Improvements / CWSRF No. CS010864-02

Contract Name: Contract 1 – Treatment and Collection System Improvements

Bidder: _____

Bidder's Address: _____

TO BIDDER:

You are notified that Owner has accepted your Bid dated _____ 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 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.

Five (5) unexecuted counterparts of the Agreement accompany this Notice of Award, and **five (5)** copies 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 **five (5)** 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 General Conditions, (Articles 2 and 6), and Supplementary 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 ten 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 Brundidge**

By *(signature)*: _____

Name *(printed)*: Isabell Boyd

Title: Mayor

Copy: Engineer

SECTION 00 52 13 – AGREEMENT FORM (STIPULATED PRICE)

This Agreement is by and between the City of Brundidge ("Owner") and _____ ("Contractor").

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: Contract 1 – Treatment and Collection System Improvements / CWSRF No. CS010864-02.

ARTICLE 2 – THE PROJECT

2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows: Contract 1 – Treatment and Collection System Improvements / CWSRF No. CS010864-02.

ARTICLE 3 – ENGINEER

3.01 The Owner has retained **Poly, 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 **"Engineer"**.

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: Dates*

A. The Work will be substantially completed within **240** calendar days after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within **270** calendar days after the date when the Contract Times commence to run.

B.

4.03 *Liquidated Damages*

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

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

1. *Substantial Completion*: Contractor shall pay Owner $**500.00** for each day that expires after the time (as duly adjusted pursuant to the Contract) specified above for Substantial Completion, until the Work is substantially complete.
2. *Completion of Remaining Work*: After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay Owner $**500.00** for each day that expires after such time until the Work is completed and ready for final payment.
3. *Milestones*: Contractor shall pay Owner $**500.00** for each day that expires after the time (as duly adjusted pursuant to the Contract) specified above for achievement of Milestone 1, until Milestone 1 is achieved, or until the time specified for Substantial Completion is reached, at which time the rate indicated in Paragraph 4.05.A.1 will apply, rather than the Milestone rate.
4. Liquidated damages for failing to timely attain Milestones, Substantial Completion, and final completion are not additive, and will not be imposed concurrently.

B. If Owner recovers liquidated damages for a delay in completion by Contractor, then such liquidated damages are Owner's sole and exclusive remedy for such delay, and Owner is precluded from recovering any other damages, whether actual, direct, excess, or consequential, for such delay, except for special damages (if any) specified in this Agreement.

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, at the lump sum prices stated in Contractor's Bid.

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) stated in Contractor's Bid.

1. 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. Contractor's Bid is attached hereto as an exhibit.

D. Contract Price is $_____.

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) If the Work has been 50 percent completed as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, then as long as the character and progress of the Work remain satisfactory to Owner and Engineer, there will be no additional retainage; and

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

B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to 98 percent of the Work completed, less such amounts set off by Owner pursuant to Paragraph 15.01.E of the General Conditions, and less 100 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 shall bear interest at the rate of 6 percent per annum.

ARTICLE 7 – CONTRACT DOCUMENTS

7.01 *Contents*

A. The Contract Documents consist of the following:

1. This Agreement.

2. Bonds:

a. Performance bond (together with power of attorney).

b. Payment bond (together with power of attorney).

3. General Conditions.

4. Supplementary Conditions.

5. Specifications as listed in the table of contents of the Project Manual.

6. Drawings (not attached but incorporated by reference) consisting of **21** sheets with each sheet bearing the following general title: CONTRACT 1 – TREATMENT AND COLLECTION SYSTEM IMPROVEMENTS / CWSRF NO. CS010864-02.

7. Addenda (numbers ___ to ___, inclusive).

8. Exhibits to this Agreement (enumerated as follows):

   a. Contractor's Bid.

9. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:

   a. Notice to Proceed.

   b. Work Change Directives.

   c. Change Orders.

   d. Field Orders.

   e. Warranty Bond, if any.

B. The Contract Documents listed in Paragraph 7.01.A are attached to this Agreement (except as expressly noted otherwise above).

C. There are no Contract Documents other than those listed above in this Article 7.

D. The Contract Documents may only be amended, modified, or supplemented as provided in the Contract.

ARTICLE 8 – REPRESENTATIONS, CERTIFICATIONS, AND STIPULATIONS

8.01 *Contractor's Representations*

A. In order to induce Owner to enter into this Contract, Contractor makes the following representations:

1. Contractor has examined and carefully studied the Contract Documents, including Addenda.

2. Contractor has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

3. Contractor is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work.

4. Contractor has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the

Supplementary Conditions, with respect to the Technical Data in such reports and drawings.

5. Contractor has carefully studied the reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, with respect to Technical Data in such reports and drawings.

6. Contractor has considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and (c) Contractor's safety precautions and programs.

7. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.

8. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.

9. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.

10. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

11. Contractor's entry into this Contract constitutes an incontrovertible representation by Contractor that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

8.02 *Contractor's Certifications*

A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 8.02:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Contract execution;

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. “collusive practice” means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and

4. “coercive practice” means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

8.03 *Standard General Conditions*

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

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

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

Owner:	Contractor:
CITY OF BRUNDIDGE *(typed or printed name of organization)*	_____ *(typed or printed name of organization)*
By: _____ *(individual's signature)*	By: _____ *(individual's signature)*
Date: _____ *(date signed)*	Date: _____ *(date signed)*
Name: Isabell Boyd *(typed or printed)*	Name: _____ *(typed or printed)*
Title: Mayor *(typed or printed)*	Title: _____ *(typed or printed)* *(If Contractor is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)*
Attest: _____ *(individual's signature)*	Attest: _____ *(individual's signature)*
Title: _____ *(typed or printed)*	Title: _____ *(typed or printed)*
Address for giving notices:	Address for giving notices:
City of Brundidge 200 N. Main St. (P.O. Box 638) Brundidge, AL 36010	_____
Designated Representative:	Designated Representative:
Name: _____ *(typed or printed)*	Name: _____ *(typed or printed)*
Title: _____ *(typed or printed)*	Title: _____ *(typed or printed)*
Address:	Address:
Phone: _____	Phone: _____
Email: _____ *(If Owner is a corporation, attach evidence of authority to sign. If Owner is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)*	Email: _____ License No.: _____ *(where applicable)* State: _____

END OF SECTION 00 52 13

SECTION 00 55 00 – NOTICE TO PROCEED

NOTICE TO PROCEED

Owner: City of Brundidge Owner's Project No.: CS010864-02

Engineer: Poly, Inc. Engineer's Project No.: 14-203.02

Contractor: Contractor's Project No.:

Project: 2022 Sewer Infrastructure Improvement / CWSRF No. CS010864-02

Contract Name: Contract 1 – Treatment and Collection System Improvements

Effective Date of Contract:

Owner hereby notifies Contractor that the Contract Times under the above Contract will commence to run on _____, 2024 pursuant to Paragraph 4.01 of the General Conditions.

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.

In accordance with the Agreement:

The number of calendar days to achieve Substantial Completion is _____ from the date stated above for the commencement of the Contract Times, resulting in a date for Substantial Completion of _____; and the number of calendar days to achieve readiness for final payment is _____ from the commencement date of the Contract Times, resulting in a date for readiness for final payment of _____.

Before starting any Work at the Site, Contractor must comply with the following:
NTU: *Note any access limitations, security procedures, or other restrictions or state None*

Owner**:**	City of Brundidge	Contractor**:**	
By *(signature)*:		By *(signature)*:	
Name *(printed)*:	Isabell Boyd	Name *(printed)*:	
Title:	Mayor	Title:	
Date Issued:			

Copy: Engineer

SECTION 00 61 13.13 – PERFORMANCE BOND

Contractor	**Surety**
Name: Address *(principal place of business)*:	Name: Address *(principal place of business)*:
Owner Name: City of Brundidge Mailing address *(principal place of business)*: 200 N. Main St. P.O. Box 638 Brundidge, AL 36010	**Contract** Description *(name and location)*: Contract 1 – Treatment and Collection System Improvements / CWSRF No. CS010864-02 Contract Price: Effective Date of Contract:

Bond

Bond Amount:

Date of Bond:

(Date of Bond cannot be earlier than Effective Date of Contract)

Modifications to this Bond form:

☐ None ☐ 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
_____ *(Full formal name of Contractor)*	_____ *(Full formal name of Surety) (corporate seal)*
By: _____ *(Signature)*	By: _____ *(Signature)(Attach Power of Attorney)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____
Attest: _____ *(Signature)*	Attest: _____ *(Signature)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	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.

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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:

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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

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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.

END OF SECTION 00 61 13.13

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SECTION 00 61 13.16 – PAYMENT BOND

Contractor	**Surety**
Name:	Name:
Address *(principal place of business)*:	Address *(principal place of business)*:
Owner	**Contract**
Name: City of Brundidge Mailing address *(principal place of business)*: 200 N. Main St. P.O. Box 638 Brundidge, AL 36010	Description *(name and location)*: Contract 1 – Treatment and Collection System Improvements / CWSRF No. CS010864-02 Contract Price: Effective Date of Contract:
Bond	
Bond Amount: Date of Bond: *(Date of Bond cannot be earlier than Effective Date of Contract)* Modifications to this Bond form: ☐ None ☐ 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
(Full formal name of Contractor)	*(Full formal name of Surety) (corporate seal)*
By: _____ *(Signature)*	By: _____ *(Signature)(Attach Power of Attorney)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____
Attest: _____ *(Signature)*	Attest: _____ *(Signature)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	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.	

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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.

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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;

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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**

END OF SECTION 00 61 13.16

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SECTION 00 63 63 – CHANGE ORDER FORM

Change Order No. _____

Owner:	City of Brundidge	Owner's Project No.:	CS010864-02
Engineer:	Poly, Inc.	Engineer's Project No.:	14-203.R1
Contractor:		Contractor's Project No.:	
Project:	2022 Sewer Infrastructure Improvements/CWSRF No. CS010864-02	Contract Name:	Contract 1 – Treatment and Collection System Improvements
Date of Issuance:		Effective Date:	

The Contract is modified as follows upon execution of this Change Order:

Description: **[Description of the change]**

Attachments: **[List related to the change]**

CHANGE IN CONTRACT PRICE	**CHANGE IN CONTRACT TIMES** *[State as specific date or number of days]*
Original Contract Price: $	Original Contract Times: Substantial Completion: Ready for Final Payment:
[Increase] [Decrease] from previously approved Change Orders No. ___ to No. ___: $	**[Increase] [Decrease]** from previously approved Change Orders No. ___ to No. ___: Substantial Completion: _____ Ready for Final Payment:
Contract Price prior to this Change Order: $	Contract Times prior to this Change Order: Substantial Completion: _____ Ready for Final Payment:
[Increase] [Decrease] this Change Order: $	[Increase] [Decrease] of this Change Order: Substantial Completion: _____ Ready for Final Payment:
Contract Price incorporating this Change Order: $	Contract Times with all approved Change Orders: Substantial Completion: _____ Ready for Final Payment:

	Recommended by Engineer (if required)	Accepted by Contractor
By:		
Title:		
Date:		
	Authorized by Owner	**Approved by Funding Agency (if applicable)**
By:		
Title:		
Date:		

SECTION 00 65 16 – CERTIFICATE OF SUBSTANTIAL COMPLETION

Owner:	City of Brundidge	Owner's Project No.:	CS010864-02
Engineer:	Poly, Inc.	Engineer's Project No.:	14-203.R1
Contractor:		Contractor's Project No.:	
Project:	2022 Sewer Infrastructure Improvements/CWSRF No. CS010864-02	Contract Name:	Contract 1 – Treatment and Collection System Improvements

This ☐ Preliminary ☐ Final Certificate of Substantial Completion applies to:

☐ All Work ☐ The following specified portions of the Work:

[Describe the portion of the work for which Certificate of Substantial Completion is issued]

Date of Substantial Completion: _____

The Work to which this Certificate applies has been inspected by authorized representatives of Owner, Contractor, and Engineer, and found to be substantially complete. The Date of Substantial Completion of the Work or portion thereof designated above is hereby established, subject to the provisions of the Contract pertaining to Substantial Completion. 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.

A punch list of items to be completed or corrected is attached to this Certificate. This list may not be all-inclusive, and the failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

Amendments of contractual responsibilities recorded in this Certificate should be the product of mutual agreement of Owner and Contractor; see Paragraph 15.03.D of the General Conditions.

The responsibilities between Owner and Contractor for security, operation, safety, maintenance, heat, utilities, insurance, and warranties upon Owner's use or occupancy of the Work must be as provided in the Contract, except as amended as follows:

Amendments to Owner's Responsibilities: ☐ None ☐ As follows:

[List amendments to Owner's Responsibilities]

Amendments to Contractor's Responsibilities: ☐ None ☐ As follows:

[List amendments to Contractor's Responsibilities]

The following documents are attached to and made a part of this Certificate:

[List attachments such as punch list; other documents]

This Certificate does not constitute an acceptance of Work not in accordance with the Contract Documents, nor is it a release of Contractor's obligation to complete the Work in accordance with the Contract Documents.

Engineer

By *(signature)*: _____

Name *(printed)*: _____

Title: _____

Date: _____

SECTION 00 65 19 – NOTICE OF ACCEPTABILITY OF WORK

Owner:	City of Brundidge	Owner's Project No.:	CS010864-02
Engineer:	Poly, Inc.	Engineer's Project No.:	14-203.R1
Contractor:		Contractor's Project No.:	
Project:	2022 Sewer Infrastructure Improvements/CWSRF No. CS010864-02	Contract Name:	Contract 1 – Treatment and Collection System Improvements
Notice Date:		Effective Date of the Construction Contract:	

The Engineer hereby gives notice to the Owner and Contractor that Engineer recommends final payment to Contractor, and that the Work furnished and performed by Contractor under the Construction Contract is acceptable, expressly subject to the provisions of the Construction Contract's Contract Documents ("Contract Documents") and of the Agreement between Owner and Engineer for Professional Services dated **[date of professional services agreement]** ("Owner-Engineer Agreement"). This Notice of Acceptability of Work (Notice) is made expressly subject to the following terms and conditions to which all who receive and rely on said Notice agree:

1. This Notice has been prepared with the skill and care ordinarily used by members of the engineering profession practicing under similar conditions at the same time and in the same locality.

2. This Notice reflects and is an expression of the Engineer's professional opinion.

3. This Notice has been prepared to the best of Engineer's knowledge, information, and belief as of the Notice Date.

4. This Notice is based entirely on and expressly limited by the scope of services Engineer has been employed by Owner to perform or furnish during construction of the Project (including observation of the Contractor's Work) under the Owner-Engineer Agreement, and applies only to facts that are within Engineer's knowledge or could reasonably have been ascertained by Engineer as a result of carrying out the responsibilities specifically assigned to Engineer under such Owner-Engineer Agreement.

5. This Notice is not a guarantee or warranty of Contractor's performance under the Construction Contract, an acceptance of Work that is not in accordance with the Contract Documents, including but not limited to defective Work discovered after final inspection, nor an assumption of responsibility for any failure of Contractor to furnish and perform the Work thereunder in accordance with the Contract Documents, or to otherwise comply with the Contract Documents or the terms of any special guarantees specified therein.

6. This Notice does not relieve Contractor of any surviving obligations under the Construction Contract, and is subject to Owner's reservations of rights with respect to completion and final payment.

Engineer

By *(signature)*: _____

Name *(printed)*: _____

Title: _____

SECTION 00 72 00 – GENERAL CONDITIONS

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared By

EJCDC®
ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

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ARTICLE 1—DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

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

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

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

3. *Application for Payment*—The 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.

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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.

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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.

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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.

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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.

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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.

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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.

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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.

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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

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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.

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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

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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.

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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.

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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

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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.

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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

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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;

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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

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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

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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

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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

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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

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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.

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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);

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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

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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.

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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.

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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;

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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.

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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.

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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.

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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

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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

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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.

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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.

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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.

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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.

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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;

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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.

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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

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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

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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.

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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.

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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.

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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.

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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.

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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:

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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.

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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

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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

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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

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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

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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.

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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, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.

2. 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

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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

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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.

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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,

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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,

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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

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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.

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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;

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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

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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

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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.

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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,

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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.

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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,

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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

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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.

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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.

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SECTION 00 73 00 – SUPPLEMENTARY CONDITIONS

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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

1.01 *Defined Terms*

SC-1.01 Add the following paragraph immediately after Paragraph 1.01.A.50:

51. *Agency* – The Federal or state agency providing partial or full financing for this project. The project is financed in whole or in part by ADEM.

ARTICLE 2—PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

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

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

C. *Evidence of Owner’s Insurance:* After receipt from Contractor of the signed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor copies of the policies of insurance to be provided by Owner in this Contract (if any). Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

SC-2.04 Amend the first sentence of Paragraph 2.01.A to read as follows:

Change “… Engineer, and others …” to “… Engineer, Agency, and others …”

2.06 *Electronic Transmittals*

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

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

1. *Basic Requirements*

    a. To the fullest extent practical, the parties agree to and will transmit and accept Electronic Documents in an electronic or digital format using the procedures described in this Protocol. Use of the Electronic Documents and any information contained therein is subject to the requirements of this Protocol and other provisions of the Contract.

    b. The contents of the information in any Electronic Document will be the responsibility of the transmitting party.

    c. Electronic Documents as exchanged by this Protocol may be used in the same manner as the printed versions of the same documents that are exchanged using non-electronic format and methods, subject to the same governing requirements, limitations, and restrictions, set forth in the Contract Documents.

    d. Except as otherwise explicitly stated herein, the terms of this Protocol will be incorporated into any other agreement or subcontract between a party and any third party for any portion of the Work on the Project, or any Project-related services, where that third party is, either directly or indirectly, required to exchange Electronic Documents with a party or with Engineer. Nothing herein will modify the requirements of the Contract regarding communications between and among the parties and their subcontractors and consultants.

    e. When transmitting Electronic Documents, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the receiving party's use of software application packages, operating systems, or computer hardware differing from those established in this Protocol.

    f. Nothing herein negates any obligation 1) in the Contract to create, provide, or maintain an original printed record version of Drawings and Specifications, signed and sealed according to applicable Laws and Regulations; 2) to comply with any applicable Law or Regulation governing the signing and sealing of design documents or the signing and electronic transmission of any other documents; or 3) to comply with the notice requirements of Paragraph 18.01 of the General Conditions.

2. *System Infrastructure for Electronic Document Exchange*

    a. Each party will provide hardware, operating system(s) software, internet, e-mail, and large file transfer functions ("System Infrastructure") at its own cost and sufficient for complying with the EDP requirements. With the exception of minimum standards set forth in this EDP, and any explicit system requirements specified by attachment to this EDP, it is the obligation of each party to determine, for itself, its own System Infrastructure.

        1) The maximum size of an email attachment for exchange of Electronic Documents under this EDP is 10 MB. Attachments larger than that may be exchanged using large file transfer functions or physical media.

        2) Each Party assumes full and complete responsibility for any and all of its own costs, delays, deficiencies, and errors associated with converting, translating, updating, verifying, licensing, or otherwise enabling its System Infrastructure, including operating systems and software, for use with respect to this EDP.

b. Each party is responsible for its own system operations, security, back-up, archiving, audits, printing resources, and other Information Technology ("IT") for maintaining operations of its System Infrastructure during the Project, including coordination with the party's individual(s) or entity responsible for managing its System Infrastructure and capable of addressing routine communications and other IT issues affecting the exchange of Electronic Documents.

c. Each party will operate and maintain industry-standard, industry-accepted, ISO-standard, commercial-grade security software and systems that are intended to protect the other party from: software viruses and other malicious software like worms, trojans, adware; data breaches; loss of confidentiality; and other threats in the transmission to or storage of information from the other parties, including transmission of Electronic Documents by physical media such as CD/DVD/flash drive/hard drive. To the extent that a party maintains and operates such security software and systems, it shall not be liable to the other party for any breach of system security.

d. In the case of disputes, conflicts, or modifications to the EDP required to address issues affecting System Infrastructure, the parties shall cooperatively resolve the issues; but, failing resolution, the Owner is authorized to make and require reasonable and necessary changes to the EDP to effectuate its original intent. If the changes cause additional cost or time to Contractor, not reasonably anticipated under the original EDP, Contractor may seek an adjustment in price or time under the appropriate process in the Contract.

e. Each party is responsible for its own back-up and archive of documents sent and received during the term of the contract under this EDP, unless this EDP establishes a Project document archive, either as part of a mandatory Project website or other communications protocol, upon which the parties may rely for document archiving during the specified term of operation of such Project document archive. Further, each party remains solely responsible for its own post-Project back-up and archive of Project documents after the term of the Contract, or after termination of the Project document archive, if one is established, for as long as required by the Contract and as each party deems necessary for its own purposes.

f. If a receiving party receives an obviously corrupted, damaged, or unreadable Electronic Document, the receiving party will advise the sending party of the incomplete transmission.

g. The parties will bring any non-conforming Electronic Documents into compliance with the EDP. The parties will attempt to complete a successful transmission of the Electronic Document or use an alternative delivery method to complete the communication.

h. The Owner may operate a Project information management system (also referred to in this EDP as "Project Website") for use of Owner, Engineer and Contractor during the Project for exchange and storage of Project-related communications and information. Except as otherwise provided in this EDP or the General Conditions, use of the Project Website by the parties as described in this Paragraph will be mandatory for exchange of Project documents, communications, submittals, and other Project-related information. The following conditions and standards will govern use of the Project Website:

1) Describe the period of time during which the Project Website will be operated and be available for reliance by the parties;

2) Provide any minimum system infrastructure, software licensing and security standards for access to and use of the Project Website;

3) Describe the types and extent of services to be provided at the Project Website (such as large file transfer, email, communication and document archives, etc.); and

4) Include any other Project Website attributes that may be pertinent to Contractor's use of the facility and pricing of such use.

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

1. Each party will acquire the software and software licenses necessary to create and transmit Electronic Documents and to read and to use any Electronic Documents received from the other party (and if relevant from third parties), using the software formats required in this section of the EDP.

a. Prior to using any updated version of the software required in this section for sending Electronic Documents to the other party, the originating party will first notify and receive concurrence from the other party for use of the updated version or adjust its transmission to comply with this EDP.

2. The parties agree not to intentionally edit, reverse engineer, decrypt, remove security or encryption features, or convert to another format for modification purposes any Electronic Document or information contained therein that was transmitted in a software data format, including Portable Document Format (PDF), intended by sender not to be modified, unless the receiving party obtains the permission of the sending party or is citing or quoting excerpts of the Electronic Document for Project purposes.

3. Software and data formats for exchange of Electronic Documents will conform to the requirements set forth in Exhibit A to this EDP, including software versions, if listed.

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

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

1. Release of any Electronic Document versions of the Project documents in formats other than those identified in the Electronic Documents Protocol (if any) or elsewhere in the Contract will be at the sole discretion of the Owner.

2. To extent determined by Owner, in its sole discretion, to be prudent and necessary, release of Electronic Documents versions of Project documents and other Project information requested by Contractor ("Request") in formats other than those identified in the Electronic Documents Protocol (if any) or elsewhere in the Contract will be subject to the provisions of the Owner's response to the Request, and to the following conditions to which Contractor agrees:

a. The content included in the Electronic Documents created by Engineer and covered by the Request was prepared by Engineer as an internal working document for Engineer's purposes solely, and is being provided to Contractor on an "AS IS" basis without any warranties of any kind, including, but not limited to any implied warranties of fitness for any purpose. As such, Contractor is advised and acknowledges that the content may not be suitable for Contractor's application, or

may require substantial modification and independent verification by Contractor. The content may include limited resolution of models, not-to-scale schematic representations and symbols, use of notes to convey design concepts in lieu of accurate graphics, approximations, graphical simplifications, undocumented intermediate revisions, and other devices that may affect subsequent reuse.

b. Electronic Documents containing text, graphics, metadata, or other types of data that are provided by Engineer to Contractor under the request are only for convenience of Contractor. Any conclusion or information obtained or derived from such data will be at the Contractor's sole risk and the Contractor waives any claims against Engineer or Owner arising from use of data in Electronic Documents covered by the Request.

c. Contractor shall indemnify and hold harmless Owner and Engineer and their subconsultants from all claims, damages, losses, and expenses, including attorneys' fees and defense costs arising out of or resulting from Contractor's use, adaptation, or distribution of any Electronic Documents provided under the Request.

d. Contractor agrees not to sell, copy, transfer, forward, give away or otherwise distribute this information (in source or modified file format) to any third party without the direct written authorization of Engineer, unless such distribution is specifically identified in the Request and is limited to Contractor's subcontractors. Contractor warrants that subsequent use by Contractor's subcontractors complies with all terms of the Contract Documents and Owner's response to Request.

3. In the event that Owner elects to provide or directs the Engineer to provide to Contractor any Contractor-requested Electronic Document versions of Project information that is not explicitly identified in the Contract Documents as being available to Contractor, the Owner shall be reimbursed by Contractor on an hourly basis (at $100-200 per hour depending on the labor grade) for any engineering costs necessary to create or otherwise prepare the data in a manner deemed appropriate by Engineer.

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

SC-3.01 Add the following new paragraph immediately after Paragraph 3.01.G:

H. In the event of a conflict between the various items which make up the Contract Documents, the following hierarchy of Documents shall prevail:

1. Change Orders
2. Addenda
3. Special Conditions
4. Agreement
5. Instructions to Bidders
6. Supplementary Conditions
7. General Conditions
8. Technical Specifications
9. Drawings
10. Advertisement for Bids

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

4.05 *Delays in Contractor's Progress*

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

5. *Weather-Related Delays*

a. If "abnormal weather conditions" as set forth in Paragraph 4.05.C.2 of the General Conditions are the basis for a request for an equitable adjustment in the Contract Times, such request must be documented by data substantiating each of the following: 1) that weather conditions were abnormal for the period of time in which the delay occurred, 2) that such weather conditions could not have been reasonably anticipated, and 3) that such weather conditions had an adverse effect on the Work as scheduled.

b. The existence of abnormal weather conditions will be determined on a month-by-month basis in accordance with the following:

1) Every workday on which one or more of the following conditions exist which prevents exterior construction activity for 50% or more of the scheduled workday will be considered a "bad weather day":

i) Total precipitation (rain, snow, or ice) occurring between 7:00 p.m. on the preceding day (regardless of whether such preceding day is a workday) through 7:00 p.m. on the workday in question equals or exceeds 0.1 inch liquid measure.

ii) Ambient outdoor air temperature at 10:00 a.m. is equal to or less than 32 degrees Fahrenheit.

iii) Sustained wind in excess of 25 m.p.h.

iv) Standing snow in excess of 1 inch.

2) "Bad weather days" may include, if appropriate, "dry-out", "mud", or "too wet" days only if there is a hindrance to the Work.

3) Contractor shall anticipate the number of foreseeable bad weather days per month as follows: January (4), February (4), March (5), April (3), May (4), June (4), July (7), August (9), September (4), October (3), November (4), December (4).

4) In each month, every bad weather day exceeding the number of foreseeable bad weather days established above will be considered as "abnormal weather conditions." The existence of abnormal weather conditions will not relieve Contractor of the obligation to demonstrate and document that delays caused by abnormal weather are specific to the planned work activities or that such activities thus delayed were on Contractor's then-current Progress Schedule's critical path for the Project.

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

5.03 *Subsurface and Physical Conditions*

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

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

Report Title	Date of Report	Technical Data
No Reports		

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

Drawings Title	Date of Drawings	Technical Data
No Drawings		

G. Contractor may examine copies of reports and drawings identified in SC-5.03.E and SC-5.03.F that were not included with the Bidding Documents at the office of the Engineer during regular business hours, or may request copies from Engineer.

5.06 *Hazardous Environmental Conditions*

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

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

Report Title	Date of Report	Technical Data
No Report		

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

Drawings Title	Date of Drawings	Technical Data
No Drawings		

ARTICLE 6—BONDS AND INSURANCE

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

1. *Required Performance Bond Form*: The performance bond that Contractor furnishes will be in the form of EJCDC® C-610, Performance Bond (2018 edition).
2. *Required Payment Bond Form*: The payment bond that Contractor furnishes will be in the form of EJCDC® C-615, Payment Bond (2018 edition).

6.02 *Insurance—General Provisions*

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

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

6.03 *Contractor's Insurance*

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

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

1. Claims under workers' compensation, disability benefits, and other similar employee benefit acts.
2. United States Longshoreman and Harbor Workers' Compensation Act and Jones Act coverage (if applicable).
3. Claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees (by stop-gap endorsement in monopolist worker's compensation states).
4. Foreign voluntary worker compensation (if applicable).

F. *Workers' Compensation and Employer's Liability—Minimum Policy Limits*

Workers' Compensation and Related Policies	Policy limits of not less than:
Workers' Compensation	
State	Statutory
Applicable Federal (e.g., Longshoreman's)	Statutory
Foreign voluntary workers' compensation (employer's responsibility coverage), if applicable	Statutory
Employer's Liability	
Each accident	$1,000,000
Each employee	$1,000,000
Policy limit	$1,000,000

G. *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.

H. *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. Broad form property damage coverage.
4. Severability of interests and no insured-versus-insured or cross-liability exclusions.
5. Underground, explosion, and collapse coverage.
6. Personal injury coverage.
7. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together). If Contractor demonstrates to Owner that the specified ISO endorsements are not commercially available, then Contractor may satisfy this requirement by providing equivalent endorsements.
8. For design professional additional insureds, ISO Endorsement CG 20 32 07 04 "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.

I. *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.

J. *Commercial General Liability—Minimum Policy Limits*

Commercial General Liability	**Policy limits of not less than:**
Each Occurrence	$1,000,000
Damage to Rented Premises (each occurrence)	$100,000
Medical Expenses (any one person)	$10,000
Personal and Advertising Injury	$1,000,000
General Aggregate	$2,000,000
Products – Completed Operations Aggregate	$2,000,000

K. *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 owned, hired, and non-owned motor vehicle. The automobile liability policy must be written on an occurrence basis.

Automobile Liability	**Policy limits of not less than:**
Combined Single Limit (each accident)	$2,000,000

L. *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	$2,000,000
General Aggregate	$2,000,000

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

Contractor's Pollution Liability	**Policy limits of not less than:**
Each Occurrence	$2,000,000
General Aggregate	$2,000,000

N. *Owner's and Contractor's Protective Liability*: Contractor to provide an Owner's and Contractor's Protective Liability Policy issued in the name of the Owner and Engineer covering the Contractor's obligations for Commercial General Liability as stated above.

Owner's and Contractor's Protective Liability Insurance	**Policy limits of not less than:**
Bodily Injury (each occurrence)	$1,000,000
Property Damage (each occurrence)	$1,000,000
Property Damage (annual aggregate)	$1,000,000

6.04 *Builder's Risk and Other Property Insurance*

SC-6.04 Supplement Paragraph 6.04 of the General Conditions with the following provisions:

F. *Builder's Risk Requirements:* The builder's risk insurance must:

1. be written on a builder's risk "all risk" policy form that at a minimum includes insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment stored and in transit, and must not exclude the coverage of the following risks: fire; windstorm; hail; flood; earthquake, volcanic activity, and other earth movement; lightning; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; and water damage (other than that caused by flood).

    a. Such policy will include an exception that results in coverage for ensuing losses from physical damage or loss with respect to any defective workmanship, methods, design, or materials exclusions.

    b. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake, volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance will be provided through other insurance policies acceptable to Owner and Contractor.

2. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.

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

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

5. extend to cover damage or loss to insured property while in transit.
6. allow for the waiver of the insurer's subrogation rights, as set forth in this Contract.
7. allow for partial occupancy or use by Owner by endorsement, and without cancellation or lapse of coverage.
8. include performance/hot testing and start-up, if applicable.
9. be maintained in effect until the Work is complete, as set forth in Paragraph 15.06.D of the General Conditions, or until written confirmation of Owner's procurement of property insurance following Substantial Completion, whichever occurs first.
10. include as named insureds the Owner, Engineer, Contractor, Subcontractors (of every tier), and any other individuals or entities required by this Contract to be insured under such builder's risk policy. For purposes of Paragraphs 6.04, 6.05, and 6.06 of the General Conditions, and this and all other corresponding Supplementary Conditions, the parties required to be insured will be referred to collectively as "insureds."

G. *Builder's Risk and Other Property Insurance Deductibles:* The purchaser of any required builder's risk, installation floater, or other property insurance will be responsible for costs not covered because of the application of a policy deductible.

Owner, Engineer, Contractor, Subcontractors (of every tier.

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

7.02 *Supervision and Superintendence*

SC-7.02 Add the following new subparagraphs immediately after Paragraph 7.02.B:

1. Contractor shall also designate, in writing, a representative, hereinafter referred to as Project Manager, assigned to the Project on a full-time basis during the execution of the Work who shall have the authority to act on behalf of Contractor, including executing the orders or directions of the Engineer without delay.
2. The Superintendent and/or Project Manager shall have full authority to promptly supply products, tools, plant equipment, and labor as may be required to diligently prosecute the Work.
3. All communications given to or received from the Superintendent and/or the Project Manager shall be binding on Contractor.
4. If at any time during the Project the Superintendent or Project Manager leaves the Project site while Work is in progress, Engineer shall be notified and provided with the name of Contractor's representative having responsible charge.
5. Contractor shall also designate the person responsible for Contractor's quality control while Work is in progress. Engineer shall be notified in writing prior to any change in quality control representative assignment.
6. The Superintendent and Project Manager must be capable of reading, writing, and conversing fluently in the English language. They must have a minimum of 10 years of experience in construction with at least 5 of those years on projects of similar size, character, and complexity.

7. Prior to the Preconstruction Conference, Contractor shall furnish to the Owner and Engineer the names, resumes, 24-hour contact information, and other relevant information associated with the Superintendent and Project Manager that are to be assigned to this Project. The Superintendent and Project Manager must be acceptable to the Owner and Engineer.

7.03 *Labor; Working Hours*

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

1. Regular working hours may be Monday through Friday, excluding holidays, occurring between the hours of 7:00 AM and 7:00 PM, unless restricted otherwise. Contractor shall establish regular scheduled work times, e.g., four 10-hour days, five 8-hour days, or five 10-hour days within the hours and days allowed above. Approval for specific work outside regular scheduled work times shall be requested no less than 48 hours prior to the requested work period. Contractor shall request approval of changes in regular scheduled work times no less than one week prior to the desired change. Occasional unscheduled overtime on weekdays may be permitted provided reasonable notice is given to Engineer. Night work will not be established as a regular procedure, excluding emergencies, except with written permission. Such permission, if granted, shall be upon such terms and conditions deemed appropriate in the Engineer's sole discretion.

2. Contractor shall be responsible for the cost of any overtime pay or other expense incurred by the Owner for Engineer's services (including those of the Resident Project Representative, if any), Owner's representative, and construction observation services, occasioned by the performance of Work outside of normal working hours. The cost for such services shall be based on the Engineer's current billable rates and/or subcontractor's costs plus 10%. If Contractor is responsible but does not pay, or if the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under Article 15. Contractor will not be responsible for extra costs associated with inspection overtime work when such overtime work is explicitly required by the Contract Documents.

3. Except in the case of emergencies or other unusual circumstances, no work shall be permitted on the Project on Sunday.

4. The Engineer will determine to what extend extraordinary on-site personnel work is required during Contractor's overtime work or working hours outside regular scheduled work hours.

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

7.10 *Taxes*

SC-7.10 Add the following paragraphs immediately after Paragraph 7.10.A:

B. The Owner is a government entity as defined by Code of Alabama Section 40-9-14.1. This Project is a tax exempt project as defined by Code of Alabama Section 40-9-14.1.

C. The Owner will fulfill its obligations under Code of Alabama Section 810-6-3-.77(e)(4) regarding completing an application (Form ST: EXC-01) for a sales and use tax certificate of

exemption for this Project. The Contractor shall provide the Owner all information needed for the completion of its form.

D. The Contractor and its subcontractors shall fulfill its obligations and assume the associated liabilities under Code of Alabama Section 40-9-14.1 and Alabama Administrative Code Section 810-6-3-.77 including completing and submitting an application (Form ST: EXC-01) for a sales and use tax certificate of exemption for this Project along with a copy of the signed contract to the State of Alabama.

E. The Contractor shall be responsible for determining the extent of products which meet the definition of tangible personal property which is exempt from sales and use tax.

F. Additionally, certain devices, facilities, and components thereof, or materials for use therein, as well as components of or materials used or intended for use in structures are exempt from sales and use tax in accordance with Code of Alabama Section 40-23-4(a)(16). The Contractor shall be responsible for determining the extent of products which meet the definition of Code of Alabama Section 40-23-4(a)(16) and are therefore exempt from sales and use tax.

7.13 *Safety and Protection*

SC-7.20 Add the following new paragraph immediately after Paragraph 7.19:

7.20 *Daily Reports*

A. The Contractor shall prepare a daily report for each day that Work is conducted at the Site and more frequently as required to document weather events or other events that may impact the schedule. The Contractor shall prepare the daily report by 10:00 AM the day following the report date.

B. The daily report will contain, as a minimum, the weather conditions; number of workers by craft, including supervision and management personnel on Site; active and inactive equipment on site; work accomplished by schedule activity item; problems; and visitors to the Site.

C. Contractor shall maintain one printed copy of the daily reports in a safe place at the Site and be available to Engineer for reference.

D. Upon completion of the Work, Contractor shall deliver one hard and one electronic copy of the daily reports to the Engineer.

ARTICLE 8—OTHER WORK AT THE SITE

See Section 01 11 00 for the discussions of other work at the site being conducted concurrently with the work of this Contract.

ARTICLE 9—OWNER'S RESPONSIBILITIES

See Article 10 below.

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, will act as directed by and under the supervision of Engineer, and will confer with Engineer regarding RPR's actions.

1. *General*: 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. RPR shall generally communicate with Owner only with the knowledge of and under the direction of the 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.

   d. Observe whether any work in place does not meet the requirements of any inspection, test, or approval required to be made.

   e. Advise Engineer of that part of the work in progress that RPR believes should be corrected or rejected.

10. *Inspections, Tests and System Start-ups:*

   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.

   c. Verify that tests, equipment, and systems start-ups and operating and maintenance training are conducted in the presence of appropriate Owner's personnel, and that Contractor maintains adequate records thereof.

   d. Observe, record, and report to Engineer appropriate details relative to the test procedures and systems start-ups.

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 for compliance with the established procedure for their submission and forward with recommendations to Engineer, noting particularly the relationship of the payment requested to the Schedule of Values, Work completed, and materials and equipment delivered at the Site but not incorporated in the Work.

14. *Certificates, Operation and Maintenance Manuals*: During the course of the Work, verify that materials and equipment certificates, operation and maintenance manuals and other data required by the Contract Documents to be assembled and furnished by Contractor are applicable to the items actually installed and in accordance with the Contract Documents, and have these documents delivered to Engineer for review and forwarding to Owner prior to payment for that part of the Work.

15. *Completion*

a. Participate in Engineer's visits to the Site 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.

c. 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. Accept Shop Drawing or Sample submittals from anyone other than Contractor.

8. Authorize Owner to occupy the Project in whole or in part.

ARTICLE 11—CHANGES TO THE CONTRACT

11.05 *Owner-Authorized Changes in the Work*

SC-11.05 Amend the first sentence of Paragraph 11.05.A to read as follows:

Change "… Owner may, at any time …" to "… Owner may, subject to written approval by the Agency, at any time …"

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

13.03 *Unit Price Work*

SC-13.03 Delete Paragraph 13.03.E in its entirety.

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

14.02 *Tests, Inspections, and Approvals*

SC-14.02 Delete Paragraph 14.02.B in its entirety and insert the following in its place:

B. Contractor 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, except that costs incurred in connection with the tests or inspections of covered Work will be governed by the provisions of Paragraph 14.05. The independent inspector, testing laboratory, or other qualified individual or entity shall be acceptable to the Owner and Engineer.

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

15.01 *Progress Payments*

SC-15.01.D Amend Paragraph 15.01.D.1 to read as follows:

Change "Ten days …" to "Thirty days …" and change "… with Engineer's recommendation …" to "… with Engineer's recommendation and Agency's approval …"

SC-15.01.E Add the following new paragraph immediately after Paragraph 15.01.E.1.l:

m. the Contractor's performance or furnishing of the Work is inconsistent with the funding Agency's requirements.

15.03 *Substantial Completion*

SC-15.03.B Amend the first sentence of Paragraph 15.03.B to read as follows:

Change "… Owner, Contractor, and Engineer …" to "… Owner, Agency, Contractor, and Engineer …"

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

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

agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under this Article 15.

SC-15.03.G Add the following new paragraph immediately after Paragraph 15.03.F:

G. After certificate of Substantial Completion is issued, the Contractor shall give notice of completion, using the attached form, by an advertisement in a newspaper of general circulation published within the city or county in which the Work has been done for a period of 4 successive weeks. If no newspaper is published in any county where the Work is done, the notice may be given by posting at the courthouse for 30 days and proof of same shall be made by the judge of probate, sheriff, and the Contractor.

15.04 *Partial Use or Occupancy*

SC-15.04 Add the following new paragraph immediately after Paragraph 15.04.A.4:

5. The Correction Period described in Paragraph 15.08 shall begin on the date of Substantial Completion for the entire Project regardless of any partial acceptance of the Project by the Owner.

15.06 *Final Payment*

SC-15.06 Add the following new paragraphs immediately after Paragraph 15.06.A.2.e:

f. Release of liens using the attached form.

g. Certificate of products and completed operations insurance.

h. Proof of publication of notice of completion by affidavit of the publisher and a printed copy of the notice published.

ARTICLE 18—MISCELLANEOUS

18.07 *Controlling Law*

SC-18.07 Add the following new paragraph immediately after Paragraph 18.07.A:

B. The parties acknowledge that this Contract is executed in **Pike County, Alabama** and that the Contract is to be performed in **Pike County, Alabama** . Each party hereby consents to the **Pike County** Court's sole jurisdiction over any dispute which arises as a result of the execution or performance of this Agreement, and each party hereby waives any and all objections to venue in the **Pike County** Court.

EXHIBIT A—SOFTWARE REQUIREMENTS FOR ELECTRONIC DOCUMENT EXCHANGE

Item	Electronic Documents	Transmittal Means	Data Format	Note (1)
a.1	General communications, transmittal covers, meeting notices and responses to general information requests for which there is no specific prescribed form.	Email	Email	
a.2	Meeting agendas, meeting minutes, RFI's and responses to RFI's, and Contract forms.	Email w/ Attachment	PDF	(2)
a.3	Contactors Submittals (Shop Drawings, "or equal" requests, substitution requests, documentation accompanying Sample submittals and other submittals) to Owner and Engineer, and Owner's and Engineer's responses to Contractor's Submittals, Shop Drawings, correspondence, and Applications for Payment.	Email w/ Attachment	PDF	
a.4	Correspondence; milestone and final version Submittals of reports, layouts, Drawings, maps, calculations and spreadsheets, Specifications, Drawings and other Submittals from Contractor to Owner or Engineer and for responses from Engineer and Owner to Contractor regarding Submittals.	Email w/ Attachment or LFE	PDF	
a.5	Layouts and drawings to be submitted to Owner for future use and modification.	Email w/ Attachment or LFE	DWG	
a.6	Correspondence, reports and Specifications to be submitted to Owner for future word processing use and modification.	Email w/ Attachment or LFE	DOC	
a.7	Spreadsheets and data to be submitted to Owner for future data processing use and modification.	Email w/ Attachment or LFE	EXC	
a.8	Database files and data to be submitted to Owner for future data processing use and modification.	Email w/ Attachment or LFE	DB	

Notes	
(1)	All exchanges and uses of transmitted data are subject to the appropriate provisions of Contract Documents.
(2)	Transmittal of written notices is governed by Paragraph 18.01 of the General Conditions.

Key	
Email	Standard Email formats (.htm, .rtf, or .txt). Do not use stationery formatting or other features that impair legibility of content on screen or in printed copies
LFE	Agreed upon Large File Exchange method (FTP, CD, DVD, hard drive)
PDF	Portable Document Format readable by Adobe® Acrobat Reader Version 10.0 or later
DWG	Autodesk® AutoCAD .dwg format Version 2013 or later
DOC	Microsoft® Word .docx format Version 2013 or later
EXC	Microsoft® Excel .xls or .xml format Version 2013 or later
DB	Microsoft® Access .mdb format Version 2013 or later

ATTACHMENT – ADVERTISEMENT OF COMPLETION

_____ (Contractor)

_____ (Address)

gives notice of completion of Contract 1 – Treatment and Collection System Improvements/CWSRF No. CS010864-02/City of Brundidge, Alabama (Project) and sets _____ as the date of final settlement. All persons and firms should file all claims for payment to the below address prior to the settlement date:

City of Brundidge
c/o Poly, Inc.
PO Box 837
Dothan, AL 36302

By: _____ (Name)

_____ (Title)

Leg: _____ (Publication Dates)

ATTACHMENT – CONTRACTOR'S RELEASE OF LIENS

STATE OF: _____

COUNTY OF: _____

Before me, the undersigned Notary Public, in and for the said County and State personally appeared _____, representing the Contractor, _____, who being duly sworn according to law deposes and says that all labor, materials, and outstanding claims and indebtedness of whatever nature arising out of the performance of the Contract with the City of Brundidge, the Owner, for Contract 1 – Treatment and Collection System Improvements/CWSRF No. CS010864-02, have been paid in full and that for the final payment in the amount of $_____, the Contractor releases and discharges the Owner and his authorized representatives from any liens or claims of any nature because of or arising from this contract and/or its performance which it has had, has, or may have in the future.

_____
Authorized Signature

By: _____

Title: _____

Sworn to and subscribed before me this _____ day of _____, 20_____.

_____
Notary Public Signature

My Commission Expires _____

END OF SECTION 00 73 00

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State of Alabama
Alabama Department of Environmental Management
State Revolving Fund (SRF) Loan Program

SRF Section
Permits and Services Division
Alabama Department of Environmental Management
Post Office Box 301463
Montgomery, Alabama 36130-1463

(334) 271-7793
(334) 271-7950 FAX

Supplemental General Conditions

for SRF Assisted

Public Drinking Water and Wastewater
Facilities Construction Contracts

Clean Water
State Revolving Fund

Protect Our Health from Source to Tap
Drinking Water State Revolving Fund

SRF Project Number: CS010864-02

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I – ADEM Special Conditions

1. Construction within State rights-of-way shall be in accordance with the Alabama Department of Transportation policies and procedures.

2. Construction is to be carried out in compliance with applicable NPDES permits and in a manner that prevents bypassing of raw wastewater flows during construction. If bypassing is anticipated, the ADEM NPDES Enforcement Branch (334-271-7975) shall be advised in advance and the contractor shall take all necessary steps to minimize the impacts of bypassing.

3. Siltation and soil erosion shall be minimized during construction. The contractor shall obtain an NPDES storm water permit for construction if required.

4. The owner shall provide and maintain competent and adequate supervision and inspection.

5. ADEM and EPA shall have access to the site and the project work at all times.

6. These Special Conditions shall supersede any conflicting provisions of this contract.

7. **A project sign is required.** See **Parts XVII and XVIII, pages SGC-36 – SGC-37**, for more information.

II – Bonds and Insurance

Bonding requirements shall comply with Alabama Act No. 97-225. Provisions of the Act are summarized below:

1. Bid Bond – Not less than 5% of either the owner's estimated cost or of the proposed prime contractor's bid up to a maximum of $10,000. The bid guarantee shall consist of a cashier's check drawn on an Alabama bank or a bid bond executed by a surety company duly authorized and qualified to make bonds in the State of Alabama.

2. Performance Bond – In an amount not less than 100% of the contract price.

3. Payment Bond – Payable to the awarding authority, shall be executed in an amount not less than 50% of the contract price.

In addition to the insurance requirements elsewhere in the specifications, the owner or the contractor, as appropriate, must acquire any flood insurance made available by the Federal Emergency Management Agency as required by 40 CFR 30.600 (b), if construction will take place in a flood hazard area identified by the Federal Emergency Management Agency.

III – Utilization of Disadvantaged Businesses Enterprises (DBEs)

It is the policy of the State Revolving Loan Fund (SRF) to promote a "fair share" of sub-agreement awards to **small, minority, and/or women-owned businesses** for equipment, supplies, construction, and services. Compliance with these contract provisions is required in order for project costs to be eligible for SRF funding. *The "fair share" objective is a goal, not a quota.* DBE (Disadvantaged Business Enterprise) is an all-inclusive business classification, which includes MBE (minority business enterprises and/or WBE (women business enterprises) and is used synonymously when these entities are referenced individually or collectively.

Failure on the part of the apparent successful bidder to submit required information to the Loan Recipient (Owner) may be considered (by the Loan Recipient (Owner)) in evaluating whether the bidder is responsive to the bid requirements. The project objectives for utilization of Minority Business Enterprises (MBEs) and Women's Business Enterprises (WBEs) are as follows:

Commodities (Supplies)	MBE 4%	WBE 11%
Contractual (Services)	MBE 8%	WBE 30%
Equipment	MBE 5%	WBE 20%
Construction	MBE 2.5%	WBE 3%

For purposes of clarification:

- This objective applies to any Federally assisted procurement agreement in excess of $10,000.
- This objective necessitates three responsibilities; separate solicitations must be made of small and minority and women's business enterprises.
- A minority business is a business, at least 51 percent of which is owned and controlled by minority group members (Black; Hispanic; Asian American; American Indian; and, any other designations approved by the Office of Management and Budget).
- A women's business is a business, at least 51 percent of which is owned and controlled by one or more women.
- The control determination will revolve around the minority or woman owner's involvement in the day-to-day management of the business enterprise.
- Solicitation should allow adequate time for price analysis. ADEM recommends that contact be made no later than 15 days before bid opening.
- Efforts taken to comply with this objective must be documented in detail; maintain records of firms contacted, including any negotiation efforts to reach competitive price levels, and awards to the designated firms.
- ADEM recommends that the Loan Recipient (Owner) or proposed Prime Contractor utilizes the services of the Minority Business Development Service Centers. These Centers are funded by the U.S. Department of Commerce to provide technical, financial and contracting assistance to minority and women's business enterprises. These Centers are located in a number of Regional cities.
- Use of the services provided by these Centers does not absolve the Loan Recipient (Owner) or proposed Prime Contractor from pursuing additional efforts to meet this objective.

IV – Six Affirmative Steps for Good Faith DBE (MBE-WBE) Solicitation

The Loan Recipient (Owner) shall follow the six affirmative steps found in the SRF application when using loan funds to procure sources of supplies, construction and services.

If the successful bidder plans to subcontract a portion of the project, the bidder must submit to the owner within 10 days after bid opening, evidence of the affirmative steps taken to utilize small, minority and women's businesses. These six affirmative steps or ‘good faith efforts’ are required methods to ensure that DBEs have the opportunity to compete for procurements funded by EPA financial assistance dollars. Such affirmative steps are described as follows:

1. Ensure DBEs are made aware of contracting opportunities to the fullest extent practicable through outreach and recruitment activities. This will include placing DBEs on solicitation lists and soliciting them whenever there are potential sources.

2. Make information on forthcoming opportunities available to DBEs and arrange time frames for contracts and establish delivery schedules, where the requirements permit, in a way that encourages and facilitates participation by DBEs in the competitive process. This includes, whenever possible, posting solicitation for bids or proposals for a minimum of 30 calendar days before the bid or proposal closing date.

3. Consider in the contracting process whether firms competing for large contracts could subcontract with DBEs. This will include dividing total requirements when economically feasible into smaller tasks or quantities to permit maximum participation by DBEs in the competitive process.

4. Encourage contracting with a consortium of DBEs when a contract is too large for one of these firms to handle individually.

5. Use the resources, services, and assistance of the AL Department of Transportation (ALDOT), Small Business Administration (SBA), and the Minority Business Development Agency of the Department of Commerce (MBDA).

6. If the Contractor awards subcontracts, it must take the steps described in items (1) through (5) listed above.

V – Documentation Required from Loan Recipient (Owner) and Contractor

The low, responsive, responsible bidder must forward the following items, in duplicate, to the loan recipient (owner) no later than 10 days after bid opening. The Loan Recipient (Owner) shall transmit one (1) copy of its DBE documentation of the prime contractor solicitation and one (1) copy of the prime contractor's/bidder's DBE documentation of all subcontractor solicitation to the SRF Section within 14 days after bid opening.

1. SRF project number and project name/loan name*. (*not contract name)

2. List of **all** subcontractors (DBE **and** non-DBE) with name, address, telephone number, estimated contract dollar amount and duration. If there are to be no subcontractors, please indicate such in a letter on company letterhead.

3. List of any subcontract work yet to be committed with estimate of dollar amount and duration of contract.

4. MBE-WBE (DBE) Documents - See **Part V, page SGC-6**.

5. Debarred Firms Certification – See **Part XIV, page SGC-25**.

6. Certification Regarding Equal Employment Opportunity – See **Part XIII, page SGC-24.**

The Loan Recipient (Owner) shall submit annual MBE/WBE Utilization Reports (EPA Form 5700-52A, **pages SGC-16 - SGC-17**) within 30 days of the end of the annual reporting period **(October 30th, i.e. by November 30th)**. Submit reports directly to:

Laketa Ross, Accountant
Administrative Section
Fiscal Branch
Alabama Department of Environmental Management
Post Office Box 301463
Montgomery, Alabama 36130-1463

The proposed Prime Contractor must submit the following items to the Loan Recipient (Owner):

1) DBE Compliance Form. The Loan Recipient (Owner) must submit this information to the SRF Section to demonstratecompliance with the DBE requirements. ADEM's approval is required prior to award of the construction contract and commencement of any SRF-funded construction. **(Page SGC-8)**

2) Certification Regarding Equal Employment Opportunity. This form is required of the proposed prime contractor(re: all subcontracts executed) and should be submitted with the prime proposed contractor's MBE-WBE solicitation submittal to the Loan Recipient (Owner). (**Page SGC-24**)

3) Debarred Firms Certification. This form is required of the proposed prime contractor (re: all subcontracts executed) and should be submitted with the prime proposed contractor's MBE-WBE solicitation submittal to the Loan Recipient (Owner). (**Page SGC-25**)

4) EPA Form 6100-2 DBE Subcontractor Participation Form. This form gives a DBE subcontractor the opportunity to describe the work the DBE subcontractor received from the proposed prime contractor, how much the DBE subcontractor was paid, and any other concerns the DBE subcontractor might have. The proposed prime contractor must provide this form to each DBE subcontractor for the DBE subcontractor's submittal to the SRF Section's MBE-WBE Compliance Staff (to be forwarded to EPA's DBE Coordinator). **(Page SGC-10)**

5) EPA Form 6100-3 DBE Subcontractor Performance Form. This form captures an intended DBE subcontractor's description of work to be performed for the proposed prime contractor and the price of the work. The proposed prime contractor must provide this form to each DBE subcontractor for the DBE subcontractor's submittal to the SRF Section's MBE-WBE Compliance Staff (to be forwarded to EPA's DBE Coordinator). **(Page SGC-12)**

6) EPA Form 6100-4 DBE Subcontractor Utilization Form. This form captures the proposed prime contractor's intended use of all identified DBE subcontractors and the estimated dollar amount of the work. The proposed prime contractor must provide this form to each DBE subcontractor for the DBE subcontractor's submittal to the SRF Section's MBE-WBE Compliance Staff (to be forwarded to EPA's DBE Coordinator). **(Page SGC-14)**

7) EPA Form 5700-52 A MBE/WBE Utilization Reports (DBE Annual Report), if applicable. The Loan Recipient (Owner) must submit this information to the SRF Section within 30 days of the end of the annual reporting period (October 30th), i.e., **by November 30th)**. **(Pages SGC-16 - SGC-17)**

8) Changes to Approved DBE Compliance Form, if applicable. If any changes, substitutions, or additions are proposed to the subcontractors included in previous Department approvals, the Owner must submit this information to the Department for prior approval in order for the affected subcontract work to be eligible for SRF funding. **(Page SGC-23)**

9) Certified Payrolls. These should be submitted to the Loan Recipient (Owner), at least, monthly for the prime contractor and all subcontractors. The Loan Recipient (Owner) must maintain payroll records and make these available for inspection
Please note that DBEs, MBEs, and WBEs must be certified **in writing** by EPA, SBA, or DOT (or by state, local, Tribal, or private entities whose certification criteria match EPA's). Depending upon the certifying agency, a DBE may be classified as a Disadvantaged Business Enterprise (DBE), a Minority Business Enterprise (MBE), or a Women's Business Enterprise (WBE). Written certification as a DBE (MBE or WBE) is required in order to be counted toward the Loan Recipient/Owner's MBE-WBE accomplishments.

The documentation of these good faith solicitation efforts must be detailed in order to allow for satisfactory review. Such documentation might include fax confirmation sheets, copies of solicitation letters/emails, printouts of the online solicitations, printouts of online search results, affidavits of publication in newspapers, etc. The proposed prime contractor is strongly encouraged to follow up each written, fax, or email solicitation with, at least, 1 logged phone call.

The proposed prime contractor must employ the six affirmative steps to subcontract with DBEs, even if the proposed prime contractor has achieved its fair share objectives.

The prime contractor must employ the six affirmative steps to subcontract with DBEs, even if the proposed prime contractor has achieved its fair share objectives. If a DBE subcontractor fails to complete work under the subcontract for any reason, the proposed prime contractor must notify the Loan Recipient (Owner) in writing prior to any termination and must employ the six 'good faith efforts' described above if using a replacement subcontractor. Any proposed changes from an approved DBE subcontractor must be reported to the Loan Recipient (Owner) and to the SRF Section on the Changes to Approved Subcontractors Form prior to initiation of the action. EPA Forms Nos. 6100-3 and 6100-4 must also be submitted to the SRF Section for new DBE subcontracts.

VI – Resources for Identifying MBE-WBE (DBE) Contractors/Subcontractors

The following organizations may provide assistance in soliciting DBE participation:

City of Birmingham
Office of Economic Development
ATTN: **Monique Shorts**, Economic Specialist
710 20th Street North
Birmingham, Alabama 35203
Ph: (205) 254-2799
Fax: (205) 254-7741
Monique.shorts@birmingham.gov

U.S. Small Business Administration
http://www.pro-net.sba.gov

National Association of Minority Contractors (NAMC)
https://namcatlanta.org/

Alabama Department of Transportation
ATTN: **John Huffman**
1409 Coliseum Boulevard
Montgomery, Alabama 36130
Ph: (334) 244-6261
http://www.dot.state.al.us

U.S. Department of Commerce
Minority Business Development Agency
ATTN: **Donna Ennis**
75 5th Street NW,
Suite 300
Atlanta, Georgia 30308
Ph: (404) 894-2096
http://www.mbda.gov/

Governor's Office of Minority and Women's Business Enterprises
Hilda Lockhart, STEP Project Director
401 Adams Avenue
Suite 360
Montgomery, Alabama 36130
Ph: (334) 242-2220

Birmingham Construction Industrial Authority ATTN: **Ashley Orl** or **Kimberly Bivins**
601 37th Street South
Birmingham, Alabama 35222
Ph: (205) 324-6202
aorl@bcia1.org
kbaylorbivins@bcia1.org

NOTE:

(1) The Loan Recipient (Owner) and the proposed Prime Contractor shall use the necessary resources to identify and directly solicit no less than three (3) certified DBE/MBE/WBE companies to bid in each expected contract/subcontract area. If a diligent and documented search of ALDOT, SBA, and MBDA directories does not identify three (3) potential certified DBE/MBE/WBE firms, then the proposed Prime Contractor shall post an advertisement in, at least, one (1) of the other online or print resources. Whenever possible, post solicitation for bids or proposals should be posted/advertised for a minimum of 30 calendar days before the bid or proposal closing date.

(2) Expenditures to a DBE that acts merely as a broker or passive conduit of funds, without performing, managing, or supervising the work of its subcontract in a manner consistent with normal business practices may not be counted.

(3) The proposed Prime Contractor should attempt to identify and first solicit DBEs in the geographic proximity of the project before soliciting those located farther away.

(4) In addition, our SRF DBE Compliance Staff is readily available for assistance, as follows: Laketa Ross at (334) 271-7727 or laketa.ross@adem.alabama.gov OR Diane Lockwood (DBE Coordinator) at (334) 271-7815 or dpl@adem.alabama.gov.

VII – DBE Compliance Form

NOTE: FOR DBE COMPLIANCE, ONE (1) COPY OF THIS FORM (WITH ALL INFORMATION OUTLINED) IS REQUIRED (WITH THE LOAN RECIPIENT (OWNER)'S DBE SUBMITTAL) FOR EACH PR&CS REVIEW. THE LOAN RECIPIENT (OWNER) AND PROPOSED PRIME CONTRACTOR SHOULD ENSURE THAT THIS INFORMATION IS COMPLETE *PRIOR TO THE PR&CS SUBMITTAL TO THE SRF SECTION*.

Loan Recipient: _____ SRF Loan (Project) Number: _____

CERTIFICATIONS:

I certify that the information submitted on and with this form is true and accurate and that this company has met and will continue to meet the conditions of this construction contract regarding DBE solicitation and utilization. I further certify that criteria used in selecting subcontractors and suppliers were applied equally to all potential participants and that EPA Forms 6100-2 and 6100-3 were distributed to all DBE subcontractors.

_____ Date_____
(Proposed Prime Contractor Signature)

_____
(Printed Name and Title)

I certify that I have reviewed the information submitted on and with this form and that it meets the requirements of the Loan Recipient's/Owner's State Revolving Fund loan contract.

(Only ONE (1) signature required below.)**

_____ Date_____
(Signature of Loan Recipient (Owner))

OR**

_____ Date_____
(Loan Recipient's (Owner's) Representative's Signature, (**P.E.**))

_____
(Printed Name and Title)

GENERAL INFORMATION:

Loan Recipient (Owner) Contact: _____

Loan Recipient (Owner) Phone Number/Email: _____

Consulting Engineer Contact: _____

Consulting Engineer Phone Number/Email: _____

Proposed Prime Contractor: _____

Proposed Prime Contractor Contact: _____

Proposed Prime Contractor Phone Number/Email:_____

Proposed Prime Contract Amount: $ _____

Proposed Total DBE/MBE Participation: $ _____ Percentage: ____% Goal: 2.5%

Proposed Total WBE Participation: $ _____ Percentage: ____% Goal: 3.0%

_____

Please ensure the following is submitted in the *full* DBE submittal (with the DBE COMPLIANCE FORM (page SGC-8)):

(1) **List of all committed and uncommitted subcontractors** by trade, including company name, address, telephone number, contact person, dollar amount of subcontract, and DBE/MBE/WBE status. Indicate in writing if no solicitations were made because the contractor intends to use only its own forces to accomplish the work.

(2) **Proof of certification (certificate or letter)** by EPA, SBA, DOT (or by state, local, Tribal, or private entities whose certification criteria match EPA's) for each subcontractor listed as a DBE, MBE, or WBE.

(3) **Documentation of solicitation effort for prospective DBE firms**, such as fax confirmation sheets, copies of solicitation letters/emails, printout of the online solicitations, printouts of online search results, affidavits of publication in newspapers, etc. The prime contractor is strongly encouraged to follow up each written, fax, or email solicitation with at least 1 logged phone call. Whenever possible, post solicitation for bids or proposals should be for a minimum of 30 calendar days before the bid or proposal closing date.

(4) **Justification for not selecting a certified DBE subcontractor** that submitted a low bid for any subcontract area.

(5) **Certification By Proposed Prime Contractor or Subcontractor Regarding Equal Opportunity Employment. (Page SGC-24**)

(6) **Debarred Firms Certification**. (**Page SGC-25**)

(7) **EPA Form 6100-2 DBE Subcontractor Participation Form** for **each** proposed **certified** DBE subcontractor.* (**Page SGC-10**) (*This form is completed by the proposed prime contractor. It is signed by **each** proposed subcontractor **only**.)

(8) **EPA Form 6100-3 DBE Subcontractor Performance Form** for each DBE subcontractor.** (**Page SGC-12**) (**This form is completed by the proposed prime contractor and signed by each proposed certified subcontractor and the proposed prime contractor per subcontract.)

(9) **EPA Form 6100-4 DBE Subcontractor Utilization Form** to summarize all DBE subcontracts/subcontractors.*** (**Page SGC-14**) (***This form is completed and signed by the proposed prime contractor **only**.)

NOTE:

ALL DBE contractors selected must have a current DBE certificate or letter of certification by an approved certifying agency.

Loan Recipient (Owner) DBE Submittal

At minimum, the Loan Recipient (Owner)'s DBE submittal should **always** consist of **a cover letter** (*preferred, but optional*) **and a VII - DBE Compliance Form (page SGC-8) and DBE solicitation documentation** (i.e., DBE solicitation list(s) with source(s) of list(s) clearly identified, contractor contact information and results/outcomes of each solicitation (or of the overall solicitation effort, if all results/outcomes were the same), documentation of solicitation method (i.e., copies of emails, phone logs, faxes, etc.).

Prime Contractor DBE Submittal

At minimum, the Prime Contractor's DBE submittal should **always** consist of **a cover letter** (*preferred, but optional*) **and DBE solicitation documentation** (i.e., DBE solicitation list(s) with source(s) of list(s) clearly identified, subcontractor contact information and results/outcomes of each solicitation (or of the overall solicitation effort, if all results/outcomes were the same), documentation of solicitation method (i.e., copies of emails, phone logs, faxes, etc.) **OR** a "No Subcontractors" Letter (*if none will be utilized*) **and** a List of ***ALL*** *(DBE/non-DBE) subcontractors* contracted/yet to be contracted **and** ***ALL EPA 6100 Forms*** *described above* (*DBE subcontractors selected **or not***) **and** Certification Regarding Equal Employment Opportunity **and** Debarred Firms Certification.

VIII - EPA Form 6100-2 DBE Subcontractor Participation Form

EPA United States Environmental Protection Agency

OMB Control No: 2090-0030

Disadvantaged Business Enterprise (DBE) Program
DBE Subcontractor Participation Form

An EPA Financial Assistance Agreement Recipient must require its prime contractors to provide this form to its DBE subcontractors. This form gives a DBE[1] subcontractor[2] the opportunity to describe work received and/or report any concerns regarding the EPA-funded project (e.g., in areas such as termination by prime contractor, late payments, etc.). The DBE subcontractor can, as an option, complete and submit this form to the EPA DBE Coordinator at any time during the project period of performance.

Subcontractor Name		Project Name
Bid/ Proposal No.	Assistance Agreement ID No. (if known)	Point of Contact
Address		
Telephone No.		Email Address
Prime Contractor Name		Issuing/Funding Entity:

Contract Item Number	Description of Work Received from the Prime Contractor Involving Construction, Services , Equipment or Supplies	Amount Received by Prime Contractor

[1] A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.205 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

[2] Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an EPA award of financial assistance.

EPA FORM 6100-2 (DBE Subcontractor Participation Form)

VIII - EPA Form 6100-2 DBE Subcontractor Participation Form

United States Environmental Protection Agency

OMB Control No: 2090-0030

Disadvantaged Business Enterprise (DBE) Program
DBE Subcontractor Participation Form

Please use the space below to report any concerns regarding the above EPA-funded project:

Subcontractor Signature	Print Name
Title	**Date**

The public reporting and recordkeeping burden for this collection of information is estimated to average three (3) hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed form to this address.

EPA FORM 6100-2 (DBE Subcontractor Participation Form)

IX - EPA Form 6100-3 DBE Subcontractor Performance Form

EPA United States Environmental Protection Agency

OMB Control No: 2090-0030

Disadvantaged Business Enterprise (DBE) Program
DBE Subcontractor Performance Form

This form is intended to capture the DBE[1] subcontractor's[2] description of work to be performed and the price of the work submitted to the prime contractor. An EPA Financial Assistance Agreement Recipient must require its prime contractor to have its DBE subcontractors complete this form and include all completed forms in the prime contractors bid or proposal package.

Subcontractor Name		Project Name
Bid/ Proposal No.	Assistance Agreement ID No. (if known)	Point of Contact
Address		
Telephone No.		Email Address
Prime Contractor Name		Issuing/Funding Entity:

Contract Item Number	Description of Work Submitted to the Prime Contractor Involving Construction, Services, Equipment or Supplies	Price of Work Submitted to the Prime Contractor
DBE Certified By: O DOT O SBA O Other: _____	Meets/ exceeds EPA certification standards? O YES O NO O Unknown	

[1] A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.205 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

[2] Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an EPA award of financial assistance.

EPA FORM 6100-3 (DBE Subcontractor Performance Form)

IX - EPA Form 6100-3 DBE Subcontractor Performance Form

EPA United States Environmental Protection Agency

OMB Control No: 2090-0030

Disadvantaged Business Enterprise (DBE) Program
DBE Subcontractor Performance Form

I certify under penalty of perjury that the forgoing statements are true and correct. Signing this form does not signify a commitment to utilize the subcontractors above. I am aware of that in the event of a replacement of a subcontractor, I will adhere to the replacement requirements set forth in 40 CFR Part 33 Section 33.302 (c).

Prime Contractor Signature	Print Name
Title	**Date**

Subcontractor Signature	Print Name
Title	**Date**

The public reporting and recordkeeping burden for this collection of information is estimated to average three (3) hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed form to this address.

EPA FORM 6100-3 (DBE Subcontractor Performance Form)

X - EPA Form 6100-4 DBE Subcontractor Utilization Form

EPA United States Environmental Protection Agency

OMB Control No: 2090-0030

Disadvantaged Business Enterprise (DBE) Program
DBE Subcontractor Utilization Form

This form is intended to capture the prime contractor's actual and/or anticipated use of identified certified DBE[1] subcontractors[2] and the estimated dollar amount of each subcontract. An EPA Financial Assistance Agreement Recipient must require its prime contractors to complete this form and include it in the bid or proposal package. Prime contractors should also maintain a copy of this form on file.

Prime Contractor Name		Project Name
Bid/ Proposal No.	Assistance Agreement ID No. (if known)	Point of Contact
Address		
Telephone No.		Email Address
Issuing/Funding Entity:		

I have identified potential DBE certified subcontractors	○ YES	◉ NO
If yes, please complete the table below. If no, please explain:		

Subcontractor Name/ Company Name	Company Address/ Phone/ Email	Est. Dollar Amt	Currently DBE Certified?

Continue on back if needed

[1] A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.205 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

[2] Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an EPA award of financial assistance.

EPA FORM 6100-4 (DBE Subcontractor Utilization Form)

X - EPA Form 6100-4 DBE Subcontractor Utilization Form

EPA United States Environmental Protection Agency

OMB Control No: 2090-0030

Disadvantaged Business Enterprise (DBE) Program
DBE Subcontractor Utilization Form

I certify under penalty of perjury that the forgoing statements are true and correct. Signing this form does not signify a commitment to utilize the subcontractors above. I am aware of that in the event of a replacement of a subcontractor, I will adhere to the replacement requirements set forth in 40 CFR Part 33 Section 33.302 (c).

Prime Contractor Signature	Print Name
Title	**Date**

The public reporting and recordkeeping burden for this collection of information is estimated to average three (3) hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed form to this address.

EPA FORM 6100-4 (DBE Subcontractor Utilization Form)

OMB CONTROL NO. 2030-0020

U.S. ENVIRONMENTAL PROTECTION AGENCY
MBE/WBE UTILIZATION UNDER FEDERAL GRANTS AND COOPERATIVE AGREEMENTS

PART I OF II
(PAGES SGC-16 & SGC-17)

FOR COOPERATIVE AGREEMENTS OR OTHER FEDERAL FINANCIAL ASSISTANCE WHERE THE COMBINED TOTAL OF FUNDS BUDGETED FOR PROCURING SUPPLIES, EQUIPMENT, CONSTRUCTION OR SERVICES EXCEED $150,000.

PART 1: PLEASE REVIEW INSTRUCTIONS BEFORE COMPLETING

1A. FEDERAL FISCAL YEAR (Oct 1- Sep 30)	1B. REPORT TYPE
20_____	☐ Annual ☐ Last Report (Project completed)

1C: REVISION OF A PRIOR YEAR REPORT? ◯ No ◯ Yes, Year_____

IF YES, BRIEFLY DESCRIBE THE REVISIONS YOU ARE MAKING:

2A. EPA FINANCIAL ASSISTANCE OFFICE ADDRESS (ATTN: DBE COORDINATOR)	3A. RECIPIENT NAME AND ADDRESS
2B. EPA DBE COORDINATOR Name: Email: Phone: Fax:	3B. RECIPIENT REPORTING CONTACT Name: Address: Phone: Email:
4A. FINANCIAL ASSISTANCE AGREEMENT ID NUMBER (SRF State Recipients, refer to Instructions for Completion of blocks 4A, 5A and 5C)	4B. FEDERAL FINANCIAL ASSISTANCE PROGRAM TITLE OR CFDA NUMBER:
5A. TOTAL ASSISTANCE AGREEMENT AMOUNT EPA Share: $ _____ Recipient Share: $ _____ ☐ **N/A (SRF Recipient)/Loan Amount: $_____**	5B. If NO procurements and NO accomplishments were made this reporting period (by the recipients, sub-recipients, loan recipients, and prime contractors), **CHECK and SKIP to Block No. 7**. (Procurements are all expenditures through contract, order, purchase, lease or barter of supplies, equipment, construction, or services needed to complete Federal assistance programs. Accomplishments, in this context, are procurements made with MBEs and/or WBEs.) ☐

5C. Total Procurements This Reporting Period (Only include amount not reported in any prior reporting period)

Total Procurement Amount $_____

(Include total dollar values awarded by recipient, sub-recipients and SRF loan recipients, including MBE/WBE expenditures.)

5D. Were sub-awards issued under this assistance agreement? Yes ◯ No ◯

Were contracts issued under this assistance agreement? Yes ◯ No ◯

5E. MBE/WBE Accomplishments This Reporting Period

Actual MBE/WBE Procurement Accomplished (Include total dollar values awarded by recipient, sub-recipients, SRF loan recipients and Prime Contractors.)

	Construction	Equipment	Services	Supplies	Total
$MBE:	_____	_____	_____	_____	0.00
$WBE:	_____	_____	_____	_____	0.00

6. COMMENTS: (If no MBE/WBE procurements, please summarize how certified MBEs/WBEs were notified of the opportunities to compete for the procurement dollars entered in Block 5C and why certified MBEs /WBEs were not awarded any procurements during this reporting period.)

7. NAME OF RECIPIENT'S AUTHORIZED REPRESENTATIVE	TITLE
8. SIGNATURE OF RECIPIENT'S AUTHORIZED REPRESENTATIVE	DATE

EPA FORM 5700-52A available electronically at https://www.epa.gov/sites/production/files/2014-09/documents/epa_form_5700_52a.pdf

If reporting DBE procurement, please enter the Loan Project Number and the information in the grid below, as applicable.
If no additional DBE procurement to report, please enter the Loan Project Number and enter 'N/A' in the black box below.

PART II OF II
(PAGES SGC-16 & SGC-17)

PART II.

MBE/WBE PROCUREMENTS MADE DURING REPORTING PERIOD

SRF Financial Assistance Agreement Number: _____

1. Procurement Made By			2. Business Enterprise		3. $ Value of Procurement	4. Date of Procurement MM/DD/YY	5. Type of Product or Service (Enter Code)	6. Name/Address/Phone Number of MBE/WBE Contractor or Vendor
Recipient	Sub-Recipient and/or SRF Loan Recipient	Prime	Minority	Women				

Type of Product or Service Codes: 1 = Construction 2 = Supplies 3 = Services 4 = Equipment

Note: Recipients are required to submit MBE/WBE reports to EPA beginning with the Federal fiscal year the recipients receive the award, continuing until the project is completed.

Instructions:

A. General Instructions:

MBE/WBE utilization is based on 40 CFR Part 33. The reporting requirement reflects the class deviation issued on November 8, 2013, clarified on January 9, 2014 and modified on December 2, 2014. EPA Form 5700-52A must be completed annually by recipients of financial assistance agreements where the combined total of funds budgeted for procuring supplies, equipment, construction or services exceeds $150,000.This reporting requirement applies to all new and existing awards and voids all previous reporting requirements.

In determining whether the $150,000 threshold is exceeded for a particular assistance agreement, the analysis must focus on funds budgeted for procurement under the supplies, equipment, construction, services or "other" categories, and include funds budgeted for procurement under sub-awards or loans

Reporting will also be required in cases where the details of the budgets of sub-awards/loans are not clear at the time of the grant awards and the combined total of the procurement and sub-awards and/or loans exceeds the $150,000 threshold.

When reporting is required, all procurement actions are reportable, not just the portion which exceeds $150,000.

If at the time of award the budgeted funds exceed $150,000 but actual expenditures fall below, a report is still required.

If at the time of award, the combined total of funds budgeted for procurements in any category is less than or equal to $150,000 and is maintained below the threshold, no DBE report is required to be submitted.

Recipients are required to report 30 days after the end of each federal year, per the terms and conditions of the financial assistance agreement.

Last reports are due October 30th or 90 days after the end of the project period, whichever comes first.

MBE/WBE program requirements, including reporting, are material terms and conditions of the financial assistance agreement.

B. Definitions:

Procurement is the acquisition through contract, order, purchase, lease or barter of supplies, equipment, construction or services needed to accomplish Federal assistance programs.

A ***contract*** is a written agreement between an EPA recipient and another party (also considered "prime contracts") and any lower tier agreement (also considered "subcontracts") for equipment, services, supplies, or construction necessary to complete the project. This definition excludes written agreements with another public agency. This definition includes personal and professional services, agreements with consultants, and purchase orders.

A ***minority business enterprise*** **(MBE)** is a business concern that is (1) at least 51 percent owned by one or more minority individuals, or, in the case of a publicly owned business, at least 51 percent of the stock is owned by one or more minority

individuals; and (2) whose daily business operations are managed and directed by one or more of the minority owners. In order to qualify and participate as an MBE prime or subcontractor for EPA recipients under EPA's DBE Program, an entity must be properly certified as required by 40 CFR Part 33, Subpart B.

U.S. citizenship is required. Recipients shall presume that minority individuals include Black Americans, Hispanic Americans, Native Americans, Asian Pacific Americans, or other groups whose members are found to be disadvantaged by the Small Business Act or by the Secretary of Commerce under section 5 of Executive order 11625. The reporting contact at EPA can provide additional information.

*A **woman business enterprise*** **(WBE)** is a business concern that is, (1) at least 51 percent owned by one or more women, or, in the case of a publicly owned business, at least 51 percent of the stock is owned by one or more women and (2) whose daily business operations are managed and directed by one or more of the women owners. In order to qualify and participate as a WBE prime or subcontractor for EPA recipients under EPA's DBE Program, an entity must be properly certified as required by 40 CFR Part 33, Subpart B.

Business firms which are 51 percent owned by minorities or women, but are in fact not managed and operated by minorities or females do not qualify for meeting MBE/WBE procurement goals. U.S. Citizenship is required.

Good Faith Efforts

A recipient is required to make the following good faith efforts whenever procuring construction, equipment, services, and supplies under an EPA financial assistance agreement. These good faith efforts for utilizing MBEs and WBEs must be documented. Such documentation is subject to EPA review upon request:

1. Ensure DBEs are made aware of contracting opportunities to the fullest extent practicable through outreach and recruitment activities. For Indian Tribal, State and Local and Government recipients, this will include placing DBEs on solicitation lists and soliciting them whenever they are potential sources.

2. Make information on forthcoming opportunities available to DBEs and arrange time frames for contracts and establish delivery schedules, where the requirements permit, in a way that encourages and facilitates participation by DBEs in the competitive process. This includes, whenever possible, posting solicitations for bids or proposals for a minimum of 30 calendar days before the bid or proposal closing date.

3. Consider in the contracting process whether firms competing for large contracts could subcontract with DBEs. For Indian Tribal, State and local Government recipients, this will include dividing total requirements when economically feasible into smaller tasks or quantities to permit maximum participation by DBEs in the competitive process.

4. Encourage contracting with a consortium of DBEs when a contract is too large for one of these firms to handle individually.

5. Use the services and assistance of the SBA and the Minority Business Development Agency of the Department of Commerce.

6. If the prime contractor awards subcontracts, require the prime contractor to take the steps in paragraphs (a) through (e) of this section.

C. Instructions for Part I:

1A. Specify Federal fiscal year this report covers. The Federal fiscal year runs from October 1st through September 30th (**e.g. November 29, 2014 falls within Federal fiscal year 2015**)

1B. Specify report type. Check the annual reporting box. Also indicate if the project is completed.

1C. Indicate if this is a revision to a previous year and provide a brief description of the revision you are making.

2A-B. Please refer to your financial assistance agreement for the mailing address of the EPA financial assistance office for your agreement.

The "EPA DBE Reporting Contact" is the DBE Coordinator for the EPA Region from which your financial assistance agreement was originated. For a list of DBE Coordinators please refer to the EPA OSBP website at http://epa.gov/osbp/dbe_cord.

3A-B. Identify the agency, state authority, university or other organization which is the recipient of the Federal financial assistance and the person to contact concerning this report.

4A. Provide the Assistance Agreement number assigned by EPA. A separate report must be submitted for each Assistance Agreement.

***For SRF recipients**: In box 4a list numbers for ALL OPEN Assistance Agreements being reported on this form.

4B. Refer back to Assistance Agreement document for this information.

5A. Provide the total amount of the Assistance Agreement which includes Federal funds plus recipient matching funds and funds from other sources.

***For SRF recipients only**: SRF recipients will not enter an amount in 5a. SRF recipients should check the "N/A" box.

5B. Self-explanatory.

5C. Provide the total dollar amount of **ALL** procurements awarded this reporting period by the recipient, sub-recipients, and SRF loan recipients, **including** MBE/WBE expenditures, not just the portion which exceeds $150,000. For example: Actual dollars for procurement from the procuring office; actual contracts let from the contracts office; actual goods, services, supplies, etc., from other sources including the central purchasing/ procurement centers).

***NOTE**: To prevent double counting on line 5C, if any amount on 5E is for a subcontract and the prime contract has already been included on Line 5C in a prior reporting period, then report the amount going to MBE or WBE subcontractor on line 5E, but exclude the amount from Line 5C. To include the amount on 5C again would result in double counting because the prime contract, which includes the subcontract, would have already been reported.

***For SRF recipients only**: In 5c please enter the total annual procurement amount under all of your SRF Assistance Agreements. The figure reported in this section is **not** directly tied to an individual Assistance Agreement identification number. **(SRF state recipients report state procurements in this section)**

5D. State whether or not sub-awards and/or subcontracts have been issued under the financial assistance agreements by indicating “yes” or “no”.

5E. Where requested, also provide the total dollar amount of all MBE/WBE procurement awarded during this reporting period by the recipient, sub-recipients, SRF loan recipients, and prime contractors in the categories of construction, equipment, services and supplies. These amounts include Federal funds plus recipient matching funds and funds from other sources.

6. If there were no MBE/WBE accomplishments this reporting period, please briefly how certified MBEs/WBEs were notified of the opportunities to compete for the procurement dollars entered in Block 5C and why certified MBEs /WBEs were not awarded any procurements during this reporting period.

7. Name and title of official administrator or designated reporting official.

8. Signature, month, day, and year report submitted.

D. Instructions for Part II:

For each MBE/WBE procurement made under this financial assistance agreements during the reporting period, provide the following information:

1. Check whether this procurement was made by the recipient, sub-recipient/SRF loan recipient, or the prime contractor.

2. Check either the MBE or WBE column. If a firm is both an MBE and WBE, the recipient may choose to count the entire procurement towards EITHER its MBE or WBE accomplishments. The recipient may also divide the total amount of the procurement (using any ratio it so chooses) and count those divided amounts toward its MBE and WBE accomplishments. If the recipient chooses to divide the procurement amount and count portions toward its MBE and WBE accomplishments, please state the appropriate amounts under the MBE and WBE columns on the form. **The combined MBE and WBE amounts for that MBE/WBE contractor must not exceed the “Value of the Procurement” reported in column #3**

3. Dollar value of procurement.

4. Date of procurement, shown as month, day, year. Date of procurement is defined as the date the contract or procurement was awarded, **not** the date the contractor received payment under the awarded contract or procurement, unless payment occurred on the date of award. **(Where direct purchasing is the procurement method, the date of procurement is the date the purchase was made)**

5. Using codes at the bottom of the form, identify type of product or service acquired through this procurement (e.g., enter 1 if construction, 2 if supplies, etc.).

6. Name, address, and telephone number of MBE/WBE firm.

**This data is requested to comply with provisions mandated by: statute or regulations (40 CFR Parts 30, 31, and 33 and/or 2 CFR Parts 200 and 1500); OMB Circulars; or added by EPA to ensure sound and effective assistance management. Accurate, complete data are required to obtain funding, while no pledge of confidentiality is provided.

The public reporting and recording burden for this collection of information is estimated to average l hour per response annually. Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclosure or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, OPPE Regulatory Information Division, U.S. Environmental Protection Agency (2136), 1200 Pennsylvania Avenue, NW, Washington, D.C. 20460. Include the OMB Control number in any correspondence. Do not send the completed form to this address.

XII – Changes to Approved DBE Compliance Form

NOTE: THIS FORM IS REQUIRED OF THE LOAN RECIPIENT (OWNER) (WITH THE PRIME CONTRACTOR'S INPUT) FOR DBE COMPLIANCE ONLY IF A SUBCONTRACTOR/SUPPLIER/VENDOR IS SOUGHT AND/OR PROCURED AFTER THE CONTRACT ATA (APPROVAL-TO-AWARD) HAS BEEN ISSUED. IT IS SIMILAR TO THE DBE COMPLIANCE FORM (PAGE SGC-8) IN THAT IT IS THE COVER/SUMMARY FORM USED TO DOCUMENT THE ADDITIONAL DBE SOLICITATION AND/OR REVISE THE ORIGINAL DBE APPROVAL STATUS.

Loan Recipient: _____ Loan (Project) Number: _____

CERTIFICATIONS:

I certify that the information submitted on and with this form is true and accurate and that this company has met and will continue to meet the conditions of this construction contract regarding DBE solicitation and utilization. I further certify that criteria used in selecting subcontractors and suppliers were applied equally to all potential participants and that EPA Forms 6100-2 and 6100-3 were distributed to all DBE subcontractors.

_____ Date_____
(Prime Contractor Signature)

_____
(Printed Name and Title)

I certify that I have reviewed the information submitted on and with this form and that it meets the requirements of the Loan Recipient's/Owner's State Revolving Fund loan contract. **(*Only ONE (1) signature required below.)**

_____ Date_____
(Signature of Loan Recipient (Owner))

OR*

_____ Date_____
(Loan Recipient's (Owner's) Representative's Signature, (**P.E.**))

_____
(Printed Name and Title)

GENERAL INFORMATION: **(Please attach additional pages to address 1 through 5, as needed.)**

(1) If an approved subcontractor is terminated or replaced, please identify this company and briefly state the reason.

(2) For new or additional subcontractors, list name, trade, address, telephone number, contact person, dollar amount of subcontract and DBE status.

(3) Attach proof of certification by EPA, SBA, DOT (or by state, local, Tribal or private entities whose certification criteria match EPA's) for each subcontractor listed as a DBE, MBE or WBE.

(4) Attach documentation of solicitation effort for prospective DBE firms, such as fax confirmation sheets, copies of solicitation letters/emails, printouts of the online solicitations, printouts of online search results, affidavits of publication in newspapers, etc. The prime contractor is strongly encouraged to follow up each solicitation with, at least, one (1) logged phone call. Whenever possible, post solicitation for bids or proposals should be for a minimum of 30 calendar days before the bid or proposal closing date.

(5) Provide justification for not selecting a certified DBE subcontractor that submitted a low bid for any subcontract area.

XIII – Certification Regarding Equal Employment Opportunity

The prime contractor is required to comply with Executive Order 112-46 of September 24, 1965 entitled "Equal Employment Opportunity" as amended by Executive Order 11375 of October 13, 1967.

The contract for the work under this proposal will obligate the prime contractor and its subcontractors not to discriminate in employment practices.

The prime contractor shall not maintain or provide for his/her employees the facilities, which are segregated on a basis of race, creed, color or national origin, whether such facilities are segregated by directive or on a de facto basis.

The prime contractor must, if requested, submit a compliance report concerning their employment practices and policies in order to maintain his/her eligibility to receive the award of the contract.

The prime contractor must be prepared to comply in all respects with any contract provisions regarding non-discrimination stipulated in conjunction with labor standards.

PRIME CONTRACTOR'S CERTIFICATION:

Prime Contractor's Name: _____

Address: _____

_____

_____

1. Bidder has participated in a previous contract or subcontract subject to the Equal Opportunity Clause. Yes____ No____
2. Compliance Reports were required to be filed in connection with such contract or subcontract. Yes____ No____
3. Bidder has filed all compliance reports due under applicable contract requirements. Yes____ No____

If answer to item 3 is "No", please explain in detail on reverse side of this certification.

Certification - The information above is true and complete to the best of my knowledge and belief.

Signature of Prime Contractor: _____

Title: _____

Date: _____

XIV – Debarred Firms Certification

All prime construction contractors shall certify that Subcontracts have not and will not be awarded to any firm that is currently on the General Service Administration's Master List of Debarred, Suspended and Voluntarily Excluded Persons, in accordance with the provisions of ADEM Administrative Code 335-6-14-.35. Debarment action is taken against a firm for noncompliance with Federal Law.

All bidders shall complete this certification in duplicate and submit both copies to the Loan Recipient (Owner) with the bid proposal. The Loan Recipient (Owner) shall transmit one copy to the SRF Section within 14 days after the bid opening.

Project Name/Loan Name*: _____
(*not **Contract** Name)

SRF Project No.: _____

The undersigned hereby certifies that the firm of _____

_____ has not and will not award a subcontract, in connection with any contract awarded to it as the result of this bid, to any firm that is currently on the General Service Administration's Master List of Debarred, Suspended, and Voluntarily Excluded Persons.

Signature of Prime Contractor: _____

Title: _____

Date: _____

XV – Davis-Bacon and Related Acts

Labor Standards Provisions for Federally Assisted Contracts

Wage Rate Requirements Under FY 2013 Continuing Appropriation

I. Requirements under the Consolidated and Further Continuing Appropriations Act. 2013 (P.L. 113-6) For Subrecipients That Are Governmental Entities:

The following terms and conditions specify how recipients will assist EPA in meeting its Davis-Bacon (DB) responsibilities when DB applies to EPA awards of financial assistance under the FY 2013 Continuing Resolution with respect to State recipients and subrecipients that are governmental entities. If a subrecipient has questions regarding when DB applies, obtaining the correct DB wage determinations, DB provisions, or compliance monitoring, it may contact the State recipient. If a State recipient needs guidance, the recipient may contact Cynthia Y. Edwards at Edwards.Cynthiay@epa.gov or at 404-562-9340 of EPA, Region 4 Grants and SRF Management Section, for guidance. The recipient or subrecipient may also obtain additional guidance from DOL's web site at http://www.dol.gov/whd/

1. Applicability of the Davis- Bacon (DB) prevailing wage requirements.

Under the FY 2013 Continuing Resolution, DB prevailing wage requirements apply to the construction, alteration, and repair of treatment works carried out in whole or in part with assistance made available by a State water pollution control revolving fund and to any construction project carried out in whole or in part by assistance made available by a drinking water treatment revolving loan fund. If a subrecipient encounters a unique situation at a site that presents uncertainties regarding DB applicability, the subrecipient must discuss the situation with the recipient State before authorizing work on that site.

2. Obtaining Wage Determinations.

(a) Subrecipients shall obtain the wage determination for the locality in which a covered activity subject to DB will take place prior to issuing requests for bids, proposals, quotes or other methods for soliciting contracts (solicitation) for activities subject to DB. These wage determinations shall be incorporated into solicitations and any subsequent contracts. Prime contracts must contain a provision requiring that subcontractors follow the wage determination incorporated into the prime contract.

(i) While the solicitation remains open, the subrecipient shall monitor www.wdol.gov weekly to ensure that the wage determination contained in the solicitation remains current. The subrecipients shall amend the solicitation if DOL issues a modification more than 10 days prior to the closing date (i.e. bid opening) for the solicitation. If DOL modifies or supersedes the applicable wage determination less than 10 days prior to the closing date, the subrecipients may request a finding from the State recipient that there is not a reasonable time to notify interested contractors of the modification of the wage determination. The State recipient will provide a report of its findings to the subrecipient.

(ii) If the subrecipient does not award the contract within 90 days of the closure of the solicitation, any modifications or supersedes DOL makes to the wage determination contained in the solicitation shall be effective unless the State recipient, at the request of the subrecipient, obtains an extension of the 90 day period from DOL pursuant to 29 CFR 1.6(c)(3)(iv). The subrecipient shall monitor www.wdol.gov on a weekly basis if it does not award the contract within 90 days of closure of the solicitation to ensure that wage determinations contained in the solicitation remain current.

(b) If the subrecipient carries out activity subject to DB by issuing a task order, work assignment or similar instrument to an existing contractor (ordering instrument) rather than by publishing a solicitation, the subrecipient shall insert the appropriate DOL wage determination from www.wdol.gov into the ordering instrument.

(c) Subrecipients shall review all subcontracts subject to DB entered into by prime contractors to verify that the prime contractor has required its subcontractors to include the applicable wage determinations.

(d) As provided in 29 CFR 1.6(f), DOL may issue a revised wage determination applicable to a subrecipient's contract after the award of a contract or the issuance of an ordering instrument if DOL determines that the subrecipient has failed to incorporate a wage determination or has used a wage determination that clearly does not apply to the contract or ordering instrument. If this occurs, the subrecipient shall either terminate the contract or ordering instrument and issue a revised solicitation or ordering instrument or incorporate DOL's wage determination retroactive to the beginning of the contract or ordering instrument by change order. The subrecipient's contractor must be compensated for any increases in wages resulting from the use of DOL's revised wage determination.

3. Contract Subcontract Provisions.

(a) The Recipient shall insure that the subrecipient(s) shall insert in full in any contract in excess of $2,000 which is entered into for the actual construction, alteration and/or repair, including painting and decorating, of a treatment work under the CWSRF or a construction project under the DWSRF financed in whole or in part from Federal funds or in accordance with guarantees of a Federal agency or financed from funds obtained by pledge of any contract of a Federal agency to make a loan, grant or annual contribution (except where a different meaning is expressly indicated), and which is subject to the labor standards provisions of any of the acts listed in § 5.1 or the FY 2010 appropriation , the following clauses:

(1) Minimum wages.

(i) All laborers and mechanics employed or working upon the site of the work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (a)(1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in § 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph (a)(1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

Subrecipients may obtain wage determinations from the U.S. Department of Labor's web site, www.dol.gov.

(ii)(A) The subrecipient(s), on behalf of EPA, shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The State award official shall approve a request for an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the subrecipient(s) agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), documentation of the action taken and the request, including the local wage determination shall be sent by the subrecipient (s) to the State award official. The State award official will transmit the request, to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210 and to the EPA DB Regional Coordinator concurrently. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification request within 30 days of receipt and so advise the State award official or will notify the State award official within the 30-day period that additional time is necessary.

(C) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the subrecipient(s) do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the award official shall refer the request and the local wage determination, including the views of all interested parties and the recommendation of the State award official, to the Administrator for determination. The request shall be sent to the EPA DB Regional Coordinator concurrently. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt of the request and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(ii)(B) or (C) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

(2) Withholding.

The subrecipient(s), shall upon written request of the EPA Award Official or an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the (Agency) may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

(3) Payrolls and basic records.

(i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(ii)(A) The contractor shall submit weekly, for each week in which any contract work is performed, a copy of all payrolls to the subrecipient, that is, the entity that receives the sub-grant or loan from the State capitalization grant recipient. Such documentation shall be available on request of the State recipient or EPA. As to each payroll copy received, the subrecipient shall provide written confirmation in a form satisfactory to the State indicating whether or not the project is in compliance with the requirements of 29 CFR 5.5(a)(1) based on the most recent payroll copies for the specified week. The payrolls shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on the weekly payrolls. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at https://www.dol.gov/agencies/whd/forms/wh347 or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the subrecipient(s) for transmission to the State or EPA if requested by EPA , the State, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the subrecipient(s).

(B) Each payroll submitted shall be accompanied by a “Statement of Compliance,” signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be provided under § 5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under § 5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (a)(3)(ii)(B) of this section.

(D) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

(iii) The contractor or subcontractor shall make the records required under paragraph (a)(3)(i) of this section available for inspection, copying, or transcription by authorized representatives of the State, EPA or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the Federal agency or State may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

(4) Apprentices and trainees.

(i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program.

If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

(5) Compliance with Copeland Act requirements.

The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

(6) Subcontracts.

The contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as the EPA determines may by appropriate, 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 the contract clauses in 29 CFR 5.5.

(7) Contract termination: debarment.

A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

(8) Compliance with Davis-Bacon and Related Act requirements.

All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

(9) Disputes concerning labor standards.

Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and Subrecipient(s), State, EPA, the U.S. Department of Labor, or the employees or their representatives.

(10) Certification of eligibility.

(i) By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

4. Contract Provision for Contracts in Excess of $100,000.

(a) Contract Work Hours and Safety Standards Act. The subrecipient shall insert the following clauses set forth in paragraphs (a)(1), (2), (3), and (4) of this section in full in any contract in an amount in excess of $100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by Item 3, above or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

(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 (a)(1) of this section the contractor and any subcontractor responsible therefore 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 (a)(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 (a)(1) of this section.

(3) Withholding for unpaid wages and liquidated damages.

The subrecipient, upon written request of the EPA Award Official or an authorized representative of the Department of Labor, shall withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.

(4) Subcontracts.

The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (a)(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 (a)(1) through (4) of this section.

(b) In addition to the clauses contained in Item 3, above, in any contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other statutes cited in 29 CFR 5.1, the Subrecipient shall insert a clause requiring that the contractor or subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the contract for all laborers and mechanics, including guards and watchmen, working on the contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. Further, the Subrecipient shall insert in any such contract a clause providing hat the records to be maintained under this paragraph shall be made available by the contractor or subcontractor for inspection, copying, or transcription by authorized representatives of the (write the name of agency) and the Department of Labor, and the contractor or subcontractor will permit such representatives to interview employees during working hours on the job.

5. Compliance Verification

(a) The subrecipient shall periodically interview a sufficient number of employees entitled to DB prevailing wages (covered employees) to verify that contractors or subcontractors are paying the appropriate wage rates. As provided in 29 CFR 5.6(a)(6), all interviews must be conducted in confidence. The subrecipient must use Standard Form 1445 (SF 1445) or equivalent documentation to memorialize the interviews. Copies of the SF 1445 are available from EPA on request.

(b) The subrecipient shall establish and follow an interview schedule based on its assessment of the risks of noncompliance with DB posed by contractors or subcontractors and the duration of the contract or subcontract. At a minimum, the subrecipient should conduct interviews with a representative group of covered employees within two weeks of each contractor or subcontractor's submission of its initial weekly payroll data and two weeks prior to the estimated completion date for the contract or subcontract. Subrecipients must conduct more frequent interviews if the initial interviews or other information
indicates that there is a risk that the contractor or subcontractor is not complying with DB. Subrecipients shall immediately conduct necessary interviews in response to an alleged violation of the prevailing wage requirements. All interviews shall be conducted in confidence.

(c) The subrecipient shall periodically conduct spot checks of a representative sample of weekly payroll data to verify that contractors or subcontractors are paying the appropriate wage rates. The subrecipient shall establish and follow a spot check schedule based on its assessment of the risks of noncompliance with DB posed by contractors or subcontractors and the duration of the contract or subcontract. At a minimum, if practicable, the subrecipient should spot check payroll data within two weeks of each contractor or subcontractor's submission of its initial payroll data and two weeks prior to the completion date the contract or subcontract . Subrecipients must conduct more frequent spot checks if the initial spot check or other information indicates that there is a risk that the contractor or subcontractor is not complying with DB. In addition, during the examinations the subrecipient shall verify evidence of fringe benefit plans and payments there under by contractors and subcontractors who claim credit for fringe benefit contributions.

(d) The subrecipient shall periodically review contractors and subcontractors use of apprentices and trainees to verify registration and certification with respect to apprenticeship and training programs approved by either the U.S Department of Labor or a state, as appropriate, and that contractors and subcontractors are not using disproportionate numbers of, laborers, trainees and apprentices. These reviews shall be conducted in accordance with the schedules for spot checks and interviews described in Item 5(b) and (c) above.

(e) Subrecipients must immediately report potential violations of the DB prevailing wage requirements to the EPA DB contact listed above and to the appropriate DOL Wage and Hour District Office listed at https://www.dol.gov/agencies/whd/contact/local-offices.

(Insert applicable wage rate determination here.)

Wage Rates are county specific for *Heavy Construction* and can be found at:
https://sam.gov/content/wage-determinations

SEE 00 73 02.02 FOR WAGE DETERMINATION

XVI – American Iron and Steel Requirement

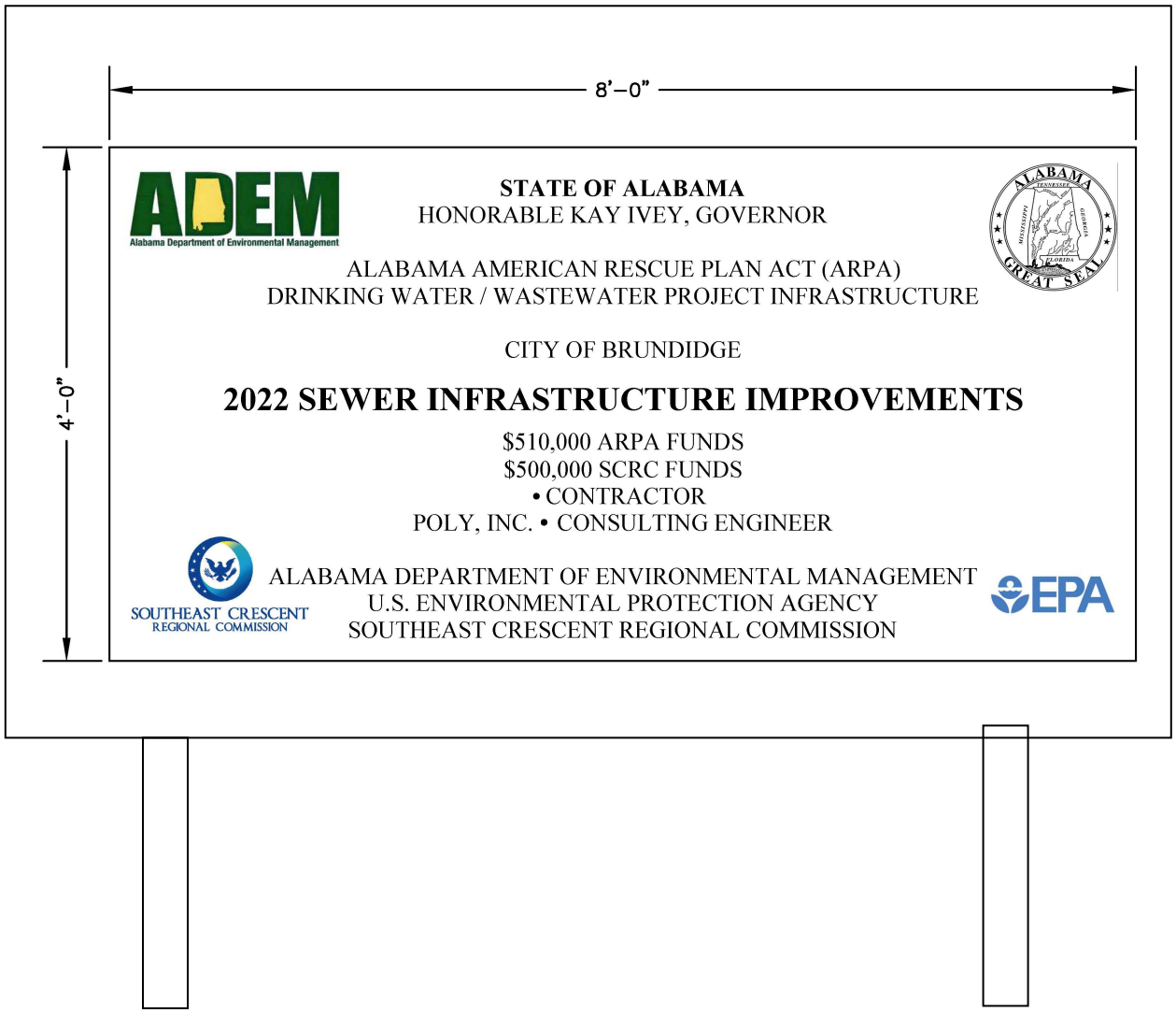
Section 4.13 Compliance with 2014 Appropriations Act. (a) The Loan Recipient agrees to comply with all federal requirements applicable to the Authority Loan (including those imposed by P.L. 113-76, Consolidated Appropriations Act (the "2014 Appropriations Act") and related SRF Policy Guidelines) which the Loan Recipient understands includes, among other things, requirements that all of the iron and steel products used in the Project are to be produced in the United States ("American Iron and Steel") unless (i) the Loan Recipient has requested and obtained a waiver from the U.S. Environmental Protection Agency pertaining to the Project or (ii) the Authority has otherwise advised the Loan Recipient in writing that the Buy American Requirement is not applicable to the Project. .

(b) The Loan Recipient also agrees to comply with all recordkeeping and reporting requirements under the Clean Water Act (codified generally under 33 U.S.C. §1251 et seq.) (the "Clean Water Act"), including any reports required by a federal agency or the Authority such as performance indicators of program deliverables, information on costs and Project progress. The Loan Recipient understands that (i) each contract and subcontract related to the Project is subject to audit by appropriate federal and state entities, and (ii) failure to comply with the Clean Water Act and this Agreement may be an Event of Default hereunder that results in a repayment of the Authority Loan in advance of the maturity of the Evidence of Indebtedness and/or other remedial actions.

The Loan Recipient agrees to cause all contractors and subcontractors to comply with (through the inclusion of appropriate terms and conditions in all contracts, subcontracts and lower tiered transactions, such terms and conditions to be in substantially the form set forth in connection with the development and construction of the project

The Contractor acknowledges to and for the benefit of the City of Brundidge, Alabama ("Purchaser"), and the Alabama Water Pollution Control Authority or the Drinking Water Finance Authority (the "State Authority") that it understands the goods and services under this Agreement are being funded with monies made available by the Clean Water State Revolving Fund that have statutory requirements commonly known as "American Iron and Steel;" that requires all of the iron and steel products used in the project to be produced in the United States ("American Iron and Steel") including iron and steel products provided by the Contractor pursuant to this Agreement. The Contractor hereby represents and warrants to and for the benefit of the Purchaser and the State Authority that (a) the Contractor has reviewed and understands the American Iron and Steel Requirement, (b) all of the iron and steel products used in the project will be and/or have been produced in the United States in a manner that complies with the American Iron and Steel Requirement, unless a waiver of the requirement is approved, and (c) the Contractor will provide any further verified information, certification or assurance of compliance with this paragraph, or information necessary to support a waiver of the American Iron and Steel Requirement, as may be requested by the Purchaser or the State Authority. Notwithstanding any other provision of this Agreement, any failure to comply with this paragraph by the Contractor shall permit the Purchaser or State Authority to recover as damages against the Contractor any loss, expense, or cost (including without limitation attorney's fees) incurred by the Purchaser or State Authority resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the State Authority or any damages owed to the State Authority by the Purchaser). While the Contractor has no direct contractual privity with the State Authority, as a lender to the Purchaser for the funding of its project, the Purchaser and the Contractor agree that the State Authority is a third-party beneficiary and neither this paragraph (nor any other provision of this Agreement necessary to give this paragraph force or effect) shall be amended or waived without the prior written consent of the State Authority.

XVII – Project Sign Detail - CWSRF



1. Sign is to be constructed of ½" MDO plywood, 4' x 8'. Alternate materials may be used if approved by ADEM prior to use.
2. Paint with two (2) coats oil-base enamel before lettering.
3. Background color white; lettering black.
4. Lettering may be painted or vinyl. All lettering sizes to be proportionate to sign layout.
5. Sign shall be attached to 4" x 4" x 8' treated posts. Alternatives may be used if approved by ADEM prior to use.
6. Sign shall be placed in prominent location, easily readable from existing street or roadway.
7. Sign shall be maintained in good condition until completion of project.

XVIII – Project Sign Detail - DWSRF

STATE OF ALABAMA
Honorable (Name), Governor

ALABAMA AMERICAN RESCUE PLAN ACT (ARPA)
DRINKING WATER / WASTEWATER PROJECT INFRASTRUCTURE

(NAME OF OWNER)
(NAME OF PROJECT)

$(amount) ARPA Funds
$(amount) State Revolving Fund Loan (if applicable)

(NAME OF CONTRACTOR) • CONTRACTOR
(NAME OF ENGINEER) • CONSULTING ENGINEER

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
U.S. ENVIRONMENTAL PROTECTION AGENCY

1. Sign is to be constructed of ½" MDO plywood, 4' x 8'. Alternate materials may be used if approved by ADEM prior to use.
2. Paint with two (2) coats oil-base enamel before lettering.
3. Background color white, lettering black.
4. Lettering may be painted or vinyl. All lettering sizes to be proportionate to sign layout.
5. Sign shall be attached to 4" x 4" x 8' treated posts. Alternatives may be used if approved by ADEM prior to use.
6. Sign shall be placed in prominent location, easily readable from existing street or roadway.
7. Sign shall be maintained in good condition until completion of project.

OMIT - SEE XVII - PROJECT SIGN DETAIL - CWSRF (PAGE SGC-36)

XIX – Construction Contract Requirements

This checklist is to be completed by the Loan Recipient (Owner)/Engineer when submitting plans and specifications to the SRF Section for review. It affirms to the SRF reviewer that the Loan Recipient (Owner)/Engineer has addressed these items (in boilerplate form) within the specifications manual.

Contract Page No.	Satisfied Yes/No	
_____	_____	Bid Advertisement (including date, time, and location of bid opening).
_____	_____	Bid Bond.
_____	_____	Performance Bond (100%).
_____	_____	Payment Bond (Not less than 50%).
_____	_____	Contract Length.
_____	_____	Liquidated Damages.
_____	_____	Liability Insurance (including workman's comp, public liability, and builder's risk, if applicable).
_____	_____	Method of Award (i.e. lowest, responsive, responsible bidder).
_____	_____	Air testing of gravity sewers (if applicable).

Within 14 days after the bid opening, the Loan Recipient (Owner)/Engineer is to prepare the Project Review and Cost Summary (per the **PR&CS Checklist, page SGC-39**) and submit it to the SRF Section of ADEM. Upon completion of review, a ***written*** ATA (Approval-to-Award) will be issued.

NOTE:

The Loan Recipient (Owner) assumes all financial risk, if the construction contract is awarded prior to the issuance of an ATA letter by the SRF Section.

XX – Project Review and Cost Summary

ADEM Alabama Department of Environmental Management	SRF Project Review and Cost Summary	Form Revised **07-2021**

This form is to be completed and submitted (with supporting documentation) to the SRF Section within 14 days after bid opening. Following satisfactory review, an ATA (Approval-to-Award) letter will be issued. After the ATA is issued/ award of the contract, a pre-construction conference should be scheduled (**with the SRF Project Manager in attendance**). *A complete, bound set of the executed contract documents manual should be forwarded to the SRF Section for review and written approval following the pre-construction conference.*

Loan Recipient: _____ Project Number: _____

Project Name: _____

Contract Number: _____ Contract Name: _____

1. Date of plans and specifications concurrence letter from ADEM-SRF Section: _____

   Date of construction permit issuance from ADEM-DW Branch: _____

2. Attach copies of the following documents:

___ a. Bid advertisement with certification by publisher and date(s) of publication.

___ b. Certified bid tabulation.

___ c. Proposal of the selected bidder.

___ d. Bid bond.

___ e. Engineer's letter to the loan recipient recommending award of the contract. If the award is made to other than the low bidder, provide justification.

___ f. Site certificates for the project, if not previously submitted with the SRF loan application.

___ g. DBE Documentation from **the loan recipient (owner) and the prime contractor**. Utilization, solicitation and documentation requirements (with a list of required documents) are discussed in detail in Parts III - V (pages SGC-3 - SGC-23) of the ADEM *SRF Supplemental General Conditions* for SRF Assisted Public Drinking Water and Wastewater Facilities Construction Contracts.

___ h. Copy of the wage determination used in bidding.

___ i. Any addenda that have been issued after ADEM review of the plans and specifications.

Comments:

_____

_____

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U.S. Department of Labor
Wage and Hour Division

PAYROLL

For contractor's optional use; see instructions at dol.gov/agencies/whd/forms/wh347

Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number.

WAGE AND HOUR DIVISION
Revised December 2008

OMB No. 1235-0008
Expires 09/30/2026

NAME OF CONTRACTOR ☐ OR SUBCONTRACTOR ☐	ADDRESS	
PAYROLL NO.	FOR WEEK ENDING	PROJECT AND LOCATION / PROJECT OR CONTRACT NO.

(1) NAME AND INDIVIDUAL IDENTIFYING NUMBER (e.g., LAST FOUR DIGITS OF SOCIAL SECURITY NUMBER) OF WORKER	(2) NO. OF WITHHOLDING EXEMPTIONS	(3) WORK CLASSIFICATION	OT. OR ST.	(4) DAY AND DATE — HOURS WORKED EACH DAY	(5) TOTAL HOURS	(6) RATE OF PAY	(7) GROSS AMOUNT EARNED	(8) DEDUCTIONS: FICA	WITH-HOLDING TAX			OTHER	TOTAL DEDUCTIONS	(9) NET WAGES PAID FOR WEEK
			O											
			S											
			O											
			S											
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While completion of Form WH-347 is optional, it is mandatory for covered contractors and subcontractors performing work on Federally financed or assisted construction contracts to respond to the information collection contained in 29 C.F.R. §§ 3.3, 5.5(a). The Copeland Act (40 U.S.C. § 3145) contractors and subcontractors performing work on Federally financed or assisted construction contracts to "furnish weekly a statement with respect to the wages paid each employee during the preceding week." U.S. Department of Labor (DOL) regulations at 29 C.F.R. § 5.5(a)(3)(ii) require contractors to submit weekly a copy of all payrolls to the Federal agency contracting for or financing the construction project, accompanied by a signed "Statement of Compliance" indicating that the payrolls are correct and complete and that each laborer or mechanic has been paid not less than the proper Davis-Bacon prevailing wage rate for the work performed. DOL and federal contracting agencies receiving this information review the information to determine that employees have received legally required wages and fringe benefits.

Public Burden Statement

We estimate that is will take an average of 55 minutes to complete this collection, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. If you have any comments regarding these estimates or any other aspect of this collection, including suggestions for reducing this burden, send them to the Administrator, Wage and Hour Division, U.S. Department of Labor, Room S3502, 200 Constitution Avenue, N.W. Washington, D.C. 20210

(over)

Date _____

I, _____ _____
(Name of Signatory Party) (Title)

do hereby state:

(1) That I pay or supervise the payment of the persons employed by

_____ on the
(Contractor or Subcontractor)

_____; that during the payroll period commencing on the
(Building or Work)

_____ day of _____, _____, and ending the _____ day of _____, _____,

all persons employed on said project have been paid the full weekly wages earned, that no rebates have been or will be made either directly or indirectly to or on behalf of said

_____ from the full
(Contractor or Subcontractor)

weekly wages earned by any person and that no deductions have been made either directly or indirectly from the full wages earned by any person, other than permissible deductions as defined in Regulations, Part 3 (29 C.F.R. Subtitle A), issued by the Secretary of Labor under the Copeland Act, as amended (48 Stat. 948, 63 Stat. 108, 72 Stat. 967; 76 Stat. 357; 40 U.S.C. § 3145), and described below:

_____

_____

_____

_____

(2) That any payrolls otherwise under this contract required to be submitted for the above period are correct and complete; that the wage rates for laborers or mechanics contained therein are not less than the applicable wage rates contained in any wage determination incorporated into the contract; that the classifications set forth therein for each laborer or mechanic conform with the work he performed.

(3) That any apprentices employed in the above period are duly registered in a bona fide apprenticeship program registered with a State apprenticeship agency recognized by the Bureau of Apprenticeship and Training, United States Department of Labor, or if no such recognized agency exists in a State, are registered with the Bureau of Apprenticeship and Training, United States Department of Labor.

(4) That:

(a) WHERE FRINGE BENEFITS ARE PAID TO APPROVED PLANS, FUNDS, OR PROGRAMS

☐ – in addition to the basic hourly wage rates paid to each laborer or mechanic listed in the above referenced payroll, payments of fringe benefits as listed in the contract have been or will be made to appropriate programs for the benefit of such employees, except as noted in section 4(c) below.

(b) WHERE FRINGE BENEFITS ARE PAID IN CASH

☐ – Each laborer or mechanic listed in the above referenced payroll has been paid, as indicated on the payroll, an amount not less than the sum of the applicable basic hourly wage rate plus the amount of the required fringe benefits as listed in the contract, except as noted in section 4(c) below.

(c) EXCEPTIONS

EXCEPTION (CRAFT)	EXPLANATION

REMARKS:

NAME AND TITLE	SIGNATURE

THE WILLFUL FALSIFICATION OF ANY OF THE ABOVE STATEMENTS MAY SUBJECT THE CONTRACTOR OR SUBCONTRACTOR TO CIVIL OR CRIMINAL PROSECUTION. SEE SECTION 1001 OF TITLE 18 AND SECTION 3729 OF TITLE 31 OF THE UNITED STATES CODE.

CONSTRUCTION TYPE: HEAVY

"General Decision Number: AL20250068 01/03/2025

Superseded General Decision Number: AL20240068

State: Alabama

Construction Type: Heavy
Including Water and Sewer Line Construction

Counties: Barbour, Bullock, Butler, Coffee, Crenshaw, Macon and Pike Counties in Alabama.

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(1).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:	. Executive Order 14026 generally applies to the contract. . The contractor must pay all covered workers at least $17.75 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2025.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:	. Executive Order 13658 generally applies to the contract. . The contractor must pay all covered workers at least $13.30 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2025.

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at http://www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/03/2025

ENGI0653-006 10/01/2023

	Rates	Fringes
Operating Engineers:		
Crane (Conventional & Hydraulic up to 100 Tons), and Derrick (Stationary Crane with 2 or more drums	$ 29.90	20.55
Crane (Conventional and Hydraulic 100 to 400 Tons) and Tower Cranes	$ 32.75	20.55
Cranes with 350 feet or more boom and/or 400 to 600 ton capacity	$ 33.85	20.55
Cranes with 500 feet Boom and/or 600 ton capacity	$ 34.20	20.55
Oiler	$ 28.95	20.55

SUAL2007-153 11/28/2007

	Rates	Fringes
ELECTRICIAN	$ 15.24 **	2.50
LABORER: Common or General	$ 8.07 **	1.19
LABORER: Pipelayer	$ 10.72 **	1.81
OPERATOR: Backhoe	$ 13.25 **	2.17
OPERATOR: Bulldozer	$ 12.72 **	1.09
OPERATOR: Drill	$ 9.50 **	2.36
OPERATOR: Grader/Blade	$ 12.59 **	1.33
OPERATOR: Loader (Front End)	$ 11.67 **	0.00
OPERATOR: Roller	$ 9.45 **	0.00
OPERATOR: Scraper	$ 9.78 **	0.18
OPERATOR: Trackhoe	$ 12.00 **	0.00
TRUCK DRIVER	$ 10.09 **	0.00

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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** Workers in this classification may be entitled to a higher minimum wage under Executive Order 14026 ($17.75) or 13658 ($13.30). Please see the Note at the top of the wage determination for more information. Please also note that the minimum wage requirements of Executive Order 14026 are not currently being enforced as to any contract or subcontract to which the states of Texas, Louisiana, or Mississippi, including their agencies, are a party.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any

solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at https://www.dol.gov/agencies/whd/government-contracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (iii)).

The body of each wage determination lists the classifications and wage rates that have been found to be prevailing for the type(s) of construction and geographic area covered by the wage determination. The classifications are listed in alphabetical order under rate identifiers indicating whether the particular rate is a union rate (current union negotiated rate), a survey rate, a weighted union average rate, a state adopted rate, or a supplemental classification rate.

Union Rate Identifiers

A four-letter identifier beginning with characters other than ""SU"", ""UAVG"", ?SA?, or ?SC? denotes that a union rate was prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2024. PLUM is an identifier of the union whose collectively bargained rate prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2024 in the example, is the effective date of the most current negotiated rate.

Union prevailing wage rates are updated to reflect all changes over time that are reported to WHD in the rates in the collective bargaining agreement (CBA) governing the classification.

Union Average Rate Identifiers

The UAVG identifier indicates that no single rate prevailed for those classifications, but that 100% of the data reported for the classifications reflected union rates. EXAMPLE: UAVG-OH-0010 01/01/2024. UAVG indicates that the rate is a weighted union average rate. OH indicates the State of Ohio. The next number, 0010 in the example, is an internal number used in producing the wage determination. The date, 01/01/2024 in the example, indicates the date the wage determination was updated to reflect the most current union average rate.

A UAVG rate will be updated once a year, usually in January, to reflect a weighted average of the current rates in the collective bargaining agreements on which the rate is based.

Survey Rate Identifiers

The ""SU"" identifier indicates that either a single non-union rate prevailed (as defined in 29 CFR 1.2) for this classification in the survey or that the rate was derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As a weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SUFL2022-007 6/27/2024. SU indicates the rate is a single non-union prevailing rate or a weighted average of survey data for that classification. FL indicates the State of Florida. 2022 is the year of the survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 6/27/2024 in the example, indicates the survey completion date for the classifications and rates under that identifier.

?SU? wage rates typically remain in effect until a new survey is conducted. However, the Wage and Hour Division (WHD) has the discretion to update such rates under 29 CFR 1.6(c)(1).

State Adopted Rate Identifiers

The ""SA"" identifier indicates that the classifications and prevailing wage rates set by a state (or local) government were adopted under 29 C.F.R 1.3(g)-(h). Example: SAME2023-007 01/03/2024. SA reflects that the rates are state adopted. ME refers to the State of Maine. 2023 is the year during which the state completed the survey on which the listed classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 01/03/2024 in the example, reflects the date on which the classifications and rates under the ?SA? identifier took effect under state law in the state from which the rates were adopted.

WAGE DETERMINATION APPEALS PROCESS

1) Has there been an initial decision in the matter? This can be:

a) a survey underlying a wage determination
b) an existing published wage determination
c) an initial WHD letter setting forth a position on a wage determination matter
d) an initial conformance (additional classification and rate) determination

On survey related matters, initial contact, including requests for summaries of surveys, should be directed to the WHD Branch of Wage Surveys. Requests can be submitted via email to davisbaconinfo@dol.gov or by mail to:

Branch of Wage Surveys
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

Regarding any other wage determination matter such as conformance decisions, requests for initial decisions should be directed to the WHD Branch of Construction Wage Determinations. Requests can be submitted via email to BCWD-Office@dol.gov or by mail to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2) If an initial decision has been issued, then any interested party (those affected by the action) that disagrees with the decision can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Requests for review and reconsideration can be submitted via email to dba.reconsideration@dol.gov or by mail to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210.

==========

END OF GENERAL DECISION"

END OF SECTION 00 73 02.02

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SECTION 01 11 00 - SUMMARY OF WORK

PART 1 - GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

A. The work of this Project consists of improvements to three wastewater pumping stations which are part of the sewage collection system plus various improvements at the Wastewater Treatment Facility including a new return sludge pumping station, upgrade to the existing utility pumping station and yard piping improvements.

B. Also included is the replacement of approximately 760 L.F. of existing 8” gravity sewer on two streets within the Brundidge Sewer System.

1.2 WORK SEQUENCE

A. The Owner will award separate contracts for other work at the Wastewater Treatment Facility to be performed concurrently with the work of this Contract. This work includes the construction of a new control building and the site work associated with that, the demolition of the existing control building, the removal and replacement of most of the onsite pavement and the removal and disposal of all accumulated sludge in existing Cells One and Seven. Some of this work directly impacts the work of this Contract.

The new return sludge pumping station in this Contract is located immediately adjacent to new heavy duty paving and the 8” force main from that station crosses underneath the new paving. Consequently, the installation of the new wet well, the 10’ x 20’ concrete slab and the new 8” return sludge force main should be the first work of this Contract.

In addition, the existing recirculation pump station cannot be removed from service, nor can it be used to drain Cells One and/or Seven until the new RAS station is in service. All the more reason why the construction of this station must be the first work of this Contract.

B. The yard piping modification should also be deferred until the New RAS Station is in service.

C. There are no restrictions on the scheduling of the pump station upgrades and line replacements in the sewer system.

1.3 CONTRACTOR’S USE OF PREMISES

A. Contractor shall limit his use of the premises for work and for storage, to allow for Owner occupancy and continuous operation of all facilities in the work area.

B. Contractor shall coordinate use of premises under direction of Owner.

C. Contractor shall assume full responsibility for the protection and safekeeping of products under this contract, stored on the site.

D. Contractor shall move any stored products, under Contractor's control, which interfere with operations of the Owner.

1.4 OWNER OCCUPANCY

A. Owner will occupy the premises during the entire period of construction for the conduct of his normal operations. Cooperate with Owner's Representative in all construction operations to minimize conflict, and to facilitate Owner usage.

1.5 EMERGENCY RESPONSE PLAN

A. The Contractor shall develop and implement, prior to the start of work, an emergency response plan for handling spills and overflow of sewage or other materials that will damage the environment. This plan shall include how an immediate response will be achieved. Contractor shall provide the name and telephone number of a local representative that can respond to emergencies on a 24-hour per day basis.

1.6 WORK HOURS

A. THE Work shall be performed only during the hours of 7 a.m. to 7 p.m., Monday through Saturday. Work may be performed outside this work window under the following conditions:

1. Contractor shall submit written request to Owner requesting different work hours and stating the reason for the request, including why it would be in the best interest of the Owner to approve the request.
2. Owner gives written approval of the request.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 11 00

SECTION 01 22 00 - MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 GENERAL

A. This section describes the methods by which measurement will be made of the quantities for which payment will be made for the project.

B. It is the intention of this specification that payment will be made for those items listed in the Bid Form only. All items of work not specifically listed in the Bid Form shall be considered incidental to the construction, and the cost of all such work and material shall be included in the prices bid for the various items listed.

1.2 STORED MATERIALS

A. Partial payment shall be made for approved materials stored at the project site at the presentation of material invoices in the proper manner as stated in the General Conditions and Contract.

1.3 MOBILIZATION

A. Mobilization shall cover the preparatory work and operations, including, but not limited to those necessary for the movement of personnel, equipment, supplies, and incidentals to the project site; for the establishment of all offices, buildings, and other facilities necessary for work on the project, and for all other work and operations which must be performed or costs incurred prior to beginning work on the various items on the project site.

B. Payment for mobilization shall be full compensation for organizing and moving all labor, tools, equipment, supplies, and incidentals to the project site and for disbanding, disorganizing, and removing all labor, tools, equipment, supplies, and incidentals from the project site, regardless of number of times such moves are made, including all preconstruction costs exclusive of bidding costs.

C. Payment for mobilization when the amount bid for mobilization is ≤ 12% of the total contract amount will be as follows:
   1. 20% of the amount bid for mobilization will be paid in the first estimate.
   2. After the first estimate and upon completion of 5% of the original contract amount for the entire project excluding prior payment for mobilization, 50% of the amount bid for mobilization will be paid.
   3. After the first estimate and upon completion of 50% of the original contract amount for the entire project including prior payment for mobilization, the remaining 30% of the amount bid for mobilization will be paid.
   4. If 50% or more of the original contract amount is completed by the first estimate, a payment of 75% of the amount bid for mobilization will be made on the first estimate. The remainder of the amount bid for mobilization will be paid on the following estimate.

5. The total sum of all payments shall not exceed the original contract amount bid for the item of mobilization, regardless of the fact that the Contractor may have, for any reason, shut down his work on the project or moved equipment away from the project and then back again.

D. Payment for mobilization when the amount bid for mobilization is ≥ 12% of the total contract amount will be as follows:
1. 2% of the amount bid for mobilization will be paid in the first estimate.
2. After the first estimate and upon completion of 5% of the original contract amount for the entire project excluding prior payment for mobilization, 6% of the amount bid for mobilization will be paid.
3. After the first estimate and upon completion of 50% of the original contract amount for the entire project including prior payment for mobilization, 4% of the amount bid for mobilization will be paid.
4. The remaining 88% will be paid with the final estimate.
5. The total sum of all payments shall not exceed the original contract amount bid for the item of mobilization, regardless of the fact that the Contractor may have, for any reason, shut down his work on the project or moved equipment away from the project and then back again.

1.4 SECTION 33 32 19.31, REFURBISHING THREE SYSTEM PUMPING STATIONS

A. All work associated with each of the Three System Pump Stations to be refurbished will be paid for on a lump sum basis for each as listed in the Bid Form. The bid price for each is to include all work related to that station as shown on the plans or called out in the specifications.

1.5 SECTION 33 32 19.32, REFURBISHING THE EXISTING RECIRCULATION PUMPING STATION

A. All work associated with the refurbishing of the Recirculation Pump Station will be paid for at the lump sum price bid for this item as listed in the Bid Form.

1.6 SECTION 33 32 21, NEW RETURN SLUDGE (RAS) PUMP STATION

A. All work associated with the construction of the New RAS Pump Station including the new manhole, valves, and piping necessary to divert sludge to the station and the discharge piping, valves, and fittings to return flow to the influent manhole to Cell 2 is to be paid for at the lump sum price bid listed in the Bid Form.

B. This includes the wet well, piping, pumps, controls, valves, hatches, concrete slab, handrailing, and all incidentals, complete in place and operational.

C. Pavement removal and replacement with crushed stone will be paid for separately at the unit price bid.

1.7 YARD PIPING MODIFICATION

A. The yard piping modification at Manhole No. 1 will be paid for on a lump sum basis at the lump sum contract price bid to include all pipe, fittings, and incidentals to bypass Manhole No. 1 as shown on the Drawings with the exception of pavement removal and replacement with crushed stone to be paid for separately at the contract unit price bid.

1.8 SECTION 01 35 24, SAFETY

A. Complying with all safety requirements including traffic control, temporary detours and structures, barricades, lights and signs shall be paid for at the Lump Sum price included in the Bid Form for traffic control.

1.9 SECTION 01 57 13, TEMPORARY EROSION CONTROL

A. Measurement for silt fencing shall be actual linear feet of silt fence installed. Payment shall be made at the price per linear foot included in the Bid Form.

B. Payment for hay bales will be at the per each price included in the Bid Form.

1.10 SECTION 31 00 00, EARTHWORK

A. Excavation:
   1. No separate measurement or payment will be made for trench earth excavation for sewers and other pipelines, nor for any other appurtenant facilities such as manholes, collars, saddles, piers, and pipe protection or encasement. Payment for all such excavation shall be included in the unit prices bid per linear foot of the various sizes of pipe laid for the respective trench depths as provided for in the contract Bid Form. Where special bedding or cradles are shown on the Drawings or required by the Engineer, no allowance shall be made for extending earth excavation in trenches to the bottom of such bedding or cradles; such costs shall be included in the unit price bid per cubic yard of bedding material or cradle.
   2. The removing of all pavements, pavement foundations, sidewalks, driveways, etc., will be included in the trench excavation for which payment will be made as provided for in paragraph a. above. No separate payment will be made for these items.
   3. No separate payment shall be made for pumping, bailing, dewatering, testing, disposal of water, draining, backfilling, removing debris or waste material nor for the disposal of any materials or similar work. Where water mains or sewers or structures are located in, near, or across stream beds or drainage ditches, no separate payment shall be made for diverting the stream flow or drainage and dewatering each section as the work progresses.

B. Sheeting and Shoring: For temporary sheeting and shoring required to comply with all safety regulations refer to Section 01 35 24 above.
   1. No separate payment will be made for sheeting and shoring left in place in trenches in accordance with these Specifications unless the upper portion is likewise ordered to be left in place under written instructions from the Engineer, in which case, sheeting so ordered to be left in place shall be measured by nominal thousand feet board measure of timber. Payment shall be made for the quantities determined as specified above at the unit

price bid per MFBM. No allowance shall be made for spikes, screens, hardware, etc., the cost of which shall be included in the unit price bid per MFBM of sheeting and shoring left in place.

C. Crushed Stone Select Foundation Material: Measurement for trench stabilization shall be by the cubic yards used by figuring the trench width (24 inches plus O.D. of the pipe) times the thickness of the crushed stone shown on the plans less the barrel diameter of the pipe squared times π divided by 4, all times the length of the trench with bedding material. Excess stone used by the Contractor will be at his own expense. Payment per cubic yard is as provided in the Bid Form. All incidental costs associated with installing the crushed stone bedding, including, but not limited to hauling, spreading, and compaction, shall be included in the applicable unit price bid.

D. Sand-Clay or Crushed Stone Base or Temporary Surfacing: If specifically listed as a pay item in the Bid Form, separate payment will be made for crushed stone for temporary surfacing of cut streets. Measurement will be made on an in-place basis based on width, depth, and length of area placed. Payment will be made at the unit price bid in the Bid Form.

E. Rock Excavation: No separate measurement or payment will be made for trench rock excavation for sewers and other pipelines, or for any other appurtenant facilities such as manholes, collars, saddles, piers, and pipe protection or encasement. Payment for all such excavation shall be included in the unit prices bid per linear foot of the various sizes of pipe laid for the respective trench depths as provided for in the Bid Form for this contract. Where special bedding or cradles are shown on the Drawings, or required by the Engineer, no allowance shall be made for extending rock excavation in trenches to the bottom of such bedding or cradle.

F. Select Backfill Borrow Material: If specifically listed as a pay item in the Bid Form, separate payment will be made for Select Backfill Borrow Material at designated or authorized locations. Measurement will be on a Loose Truck Basis using truck dump tickets signed by the Engineer. Payment will be made at the unit price bid in the Bid Form.

G. Testing: The cost of all testing shall be included in the various bid items associated with the construction. No separate payment will be made for compaction testing.

1.11 SECTION 31 11 00, CLEARING AND GRUBBING

A. Separate payment will not be made for clearing and grubbing.

1.12 SECTION 31 37 00, RIPRAP

A. Riprap installed under these Specifications will be paid for according to the rate bid per square yard for the actual installation as measured in the field. Measurement for payment shall be the area calculated using the width of installation as prescribed in the Drawings and the total length of installation as measured in the field. All costs of work and materials required for the complete installation shall be included in the price bid.

1.13 SECTION 32 20 10, REPLACEMENT PAVING, DRIVEWAYS, AND SIDEWALKS

A. Paving to be removed and replaced (not resurfacing) under these Specifications will be paid for according to the price bid per linear foot for the various types of paving replaced. Measurement shall be the actual lineal footage of pavement replaced along the pipe centerline. The price bid for removal and replacement of asphalt paving shall include all sand-clay, crushed stone or concrete base course, asphaltic concrete, and any and all additional work incidental to the installation.

B. Asphaltic leveling course shall be paid at the price bid per ton included in the Bid Form. Measurement will be the actual tons of asphaltic leveling course placed based upon asphalt delivery tickets, discounting any waste material.

C. Pavement surface course under these specifications will be paid at the price bid per square yard included in the Bid Form. Measurement will be the actual width in feet and the actual linear feet of pavement surface placed converted to square yards.

D. Bituminous prime coat shall be measured as the actual width in feet and the actual linear footage of pavement primed. Bituminous tack shall be measured as the actual width in feet and the actual linear feet of area tacked. Payment shall be made at the price bid per square yard in the Bid Form. **NOTE: Separate payment shall be made for prime or tack only when a separate pay item is included in the Bid Form, and then it shall be paid at the price bid per square yard included in the Bid Form. Otherwise there will be no separate payment for prime or tack.**

E. Concrete, drives or sidewalks shall be measured in linear feet or square yards as indicated in the Bid Form. Measurements shall be of the actual width and/or length of concrete drive or sidewalk installed. Payment shall be made at the unit price bid per linear feet or square yard in the Bid Form and shall include all forming, compaction, material, labor, reinforcing, placing, consolidating, finishing, curing, and all incidentals necessary to provide a complete and finished product.

F. No separate payment shall be made for striping. It shall be included in the price bid for paving.

1.14 SECTION 32 31 13, CHAIN LINK FENCING

A. Separate payment will not be made for chain link fencing.

1.15 SECTION 32 92 20, SEEDING AND SODDING

1.16 Seeding performed under these Specifications will be paid for according to the rate bid per acre in the Bid Form for the actual installation as measured in the field in the construction area only. Sodding performed under these specifications will be paid for according to the rate bid per square yard in the Bid Form for the actual installation as measured in the field in the construction area only. Measurement for payment shall be the area calculated from field measurements of width and length along pipeline centerline. Price bid for grassing shall include all soil preparation required, including furnishing and placing topsoil, lime, and fertilizer, all

seeding, and maintenance of grassed area until a stand of grass is achieved and until acceptance by Owner.

1.17 SECTION 33 31 13.01, POLYVINYL CHLORIDE (PVC) SEWER PIPE

A. Measurement:

1. The quantities of pipe sewers including unclassified excavation, for which payment will be allowed shall be expressed in linear feet for each size and type of pipe and applicable depth as shown in the Bid Form and shall be the horizontal length of sewer installed complete in place as measured along the centerline of the sewer with no deductions made for tee connections or manholes. The applicable vertical depth shall be measured from the original ground surface to the invert of the sewer.
2. Reinforcing steel, rock excavation, standard bedding, and other sections of work not specifically listed in the Bid Form shall not be separately measured and paid for but costs for same shall be included in the unit price or lump sum price bid for other sections of work.

B. Payment:

1. Payment for pipe sewers and connections to pipe constructed under these Specifications shall be made for the quantities determined in the manner specified in A-1 above at the contract price per linear foot or per each, as applicable, for each of the applicable pipe and sizes and types listed in the Bid Form.
2. No separate payment shall be made for connections to existing sewer pipe or manholes. The cost of this work shall be included in the unit price bid for other items of work.
3. No separate payment shall be made for any unclassified excavation or clearing in connection with sewer line construction unless specifically listed in the Bid Form. The cost of these items shall be included in the unit prices bid for pipe sewers.
4. These amounts shall cover the cost of furnishing all materials, tools, labor, plant, equipment, services, and other expense in connection with common trench excavation and furnishing and installing all items of work herein specified and when so paid, shall constitute full compensation to the Contractor.
5. No separate payment will be made for plugs installed on stub-outs for future extensions.

C. Wastewater Bypass Pumping: The Lump Sum price bid for Wastewater bypass pumping shall be for all pumping required to construct the new sewers and maintain service to all customers within the entire project. The work shall include all preliminary coordination with the Owner and Engineer, all pumps and hoses and other equipment necessary, all labor, all materials, all fuel, and all other incidentals required to complete the work and maintain service to all customers.

1.18 SECTION 33 35 00, SEWER SERVICE CONNECTIONS

A. Sewer Service wyes shall be paid at the rate bid per each in the Bid Form. Such payment shall be for a complete installation, including the cost of the wye fitting or manhole tie-in, excavation, bedding materials, backfill and all other incidentals necessary for a complete installation.

B. Sewer Service Laterals shall be paid at the rate bid per linear foot as delineated in the Bid Form. Such payment shall be for a complete installation, including the cost of the pipe, excavation, tee or riser, bends, bedding materials, concrete, backfill and flexible couplings.

C. Sewer Service Transfers shall be paid at the rate Bid per each in the Bid Form. Such payment shall include the cost to locate the existing sewer lateral serving a residence and connect new service lateral to the existing line. Separate payment shall be made for the service lateral pipe and cleanouts.

1.19 Sewer cleanouts shall be paid at the rate bid per each in the Bid Form. Such payment shall be for a complete installation, including material cost, concrete, excavation, backfill and other incidentals necessary for a complete installation.

1.20 SECTION 33 05 13, PRECAST MANHOLES

A. Unless indicated otherwise on the drawings, manholes installed under these Specifications will be paid for at the rate bid in the Bid Form for various manhole diameters and depths. Measurement for payment for manholes shall be the actual depth of manholes, measured to the nearest one-half foot from the top of the manhole frame and cover to the bottom of the manhole invert. For manholes greater than 8 feet deep, payment shall be made for one manhole 6'-8' depth plus the measurement obtained as described above, less 8 feet, times the rate bid in the Bid Form for Vertical Feet of Manholes Over 8 Feet Depth.

B. All drop manholes shall be measured and paid for as specified above and, in addition, extra payment will be allowed at applicable contract unit price for each drop connection complete including excavation, pipe and pipe specials and concrete encasement as provided in the Bid Form.

C. No extra payment will be made for the various types of cast iron frames and covers installed by the Contractor and approved by the Engineer.

D. Payment for each vented connection constructed to a manhole will be at the rate per each included in the Bid Form.

1.21 SECTION 33 05 23.13, UTILITY HORIZONTAL DIRECTIONAL DRILLING AND SECTION 33 05 23.14, UTILITY DIRECTIONAL DRILLING PRESSURE TESTING

A. Pipeline installed by horizontal, directional drilling shall be measured in linear feet along a straight, horizontal line from end to end.

B. Payment shall be made at the per linear foot price included in the Bid Form and shall include payment for all labor, materials, equipment, anchoring, pressure testing and all other incidentals required for a complete and operational pipeline.

1.22 SECTION 33 05 23.16, JACKING AND BORING OF UTILITY PIPE

A. Payment for furnishing all labor, materials, equipment and services required for the complete installation of casing pipe by boring or jacking methods, including all classes of excavation, crushed stone, concrete, wooden blocks, anchors, straps, etc., all in accordance with these Specifications and details shown on the Drawings, shall be made at the applicable unit price bid in the Bid Form and the actual number of linear feet of casing pipe installed. This measurement shall be made from outside end to outside end of casing pipe and shall include the end sections that may be installed in open trench excavation. Unit price bid shall also include the cost of any additional insurance required by the highway department for the individual crossing(s).

B. Carrier pipe shall be furnished, installed and paid for under applicable provisions of the piping sections of these Specifications at the unit price bid under the respective section in the Bid Form.

C. Payment for sewer pipeline construction in state highway rights-of-way shall be contingent upon approval and acceptance by the railroad or highway department.

D. Payment for uncased bores across and under streets and roads shall be made at the applicable unit price bid in the Bid Form for the actual number of uncased bores.

1.23 SECTION 33 05 50, POLYVINYL CHLORIDE (PVC) PRESSURE PIPE

A. Polyvinyl chloride pipe and plastic tubing shall be measured in linear feet along the centerline of the installed pipe or tubing with no deduction for fittings, valves, etc., within the limits of the installation work performed under these Contracts.

B. Any necessary repairs to existing mains and service lines damaged during performance of work under these Contracts shall be made at the Contractor's expense and no reimbursement will be made for any labor, materials, equipment or other costs involved in such repairs. Materials furnished by the Owner shall not be used for such repairs unless approved by the Owner and the Contractor compensates the Owner for the cost of such materials so used.

C. Where connections are shown or required to be made between new and existing mains, the cost of all such work, services and equipment, including excavation, cutting pipe, pumping, etc., as required to complete such connection shall be included in the unit prices bid in the Bid Form and no separate payment therefor will be made. Payment for furnishing and installing any new pipe and fittings and furnishing and installing accessory items such as valves, etc., required for such connections shall be made at the applicable unit prices bid.

D. No separate payment shall be made for concrete for concrete thrust blocking at bends and other fittings, when required and as authorized by the Engineer.

E. Payment for furnishing and installing, testing, sterilizing, and placing in service, complete in place, polyvinyl chloride pipe, plastic tubing, polyvinyl chloride fittings and polyvinyl chloride adapters and specials including all common excavation, backfill and all standard bedding material shall be made per linear foot of pipe installed at the applicable contract unit prices set forth for each size and type of pipe in the Bid Form.

F. Payment so made shall constitute full compensation to the Contractor for material, excavation, backfill, and standard bedding material, installation, sterilization and tests, including all labor, materials, tools, equipment and services necessary to complete the work as specified herein.

1.24 SECTION 33 05 51, DUCTILE IRON PIPING AND DUCTILE IRON AND CAST IRON FITTINGS

A. Measurement:
1. The quantities of cast iron and ductile iron pipe, including common excavation, for which payment will be made under this item shall be expressed in linear feet for each size and type of pipe and applicable depth as shown in the Bid Form and shall be the horizontal length of ductile iron pipe installed complete in place as measured along the centerline of the pipe with no deductions made for tees, connections, or manholes.
2. The quantities of cast iron or ductile iron fittings shall be determined in pounds based upon the catalog weight of such fittings actually installed. Weight for payment shall be calculated using actual field count of fittings installed and the published individual catalog weights of fittings exclusive of gaskets, glands, bolts, and other accessories.

B. Payment:
1. Ductile iron or cast iron fittings installed under these Specifications will be paid or at the rate bid per pound in the Bid Form.
2. No separate payment shall be made for any borrow excavation, clearing, or backfill. The cost of these items shall be included in the unit price bid for pipe under Section 33 05 51 and as provided for in the Bid Form.
3. Payment for ductile iron pipe constructed under these Specifications shall be made for the quantities determined in the manner specified above in A-1 at the price per linear foot, for each size and type of pipe and applicable depth listed in the Bid Form.
4. Payment so made shall constitute full compensation to the Contractor for the material, common excavation, backfill, installation, including all labor, materials, tools, equipment, and services necessary to complete the work as specified herein.

1.25 SECTION 33 05 52, VALVES

A. Payment for various valves to be furnished as specified in Section 40 05 51 shall be made per each at the price included in the Bid Form. This price shall include valves and operators, valve boxes, excavation, installation, backfill, compaction and all incidentals necessary to provide a complete installation. For air release valves, the price shall also include the manhole, tapping saddle, isolation valves, nipples, tapping the pipe, flushing assembly, and all other incidentals necessary.

1.26 SECTION 33 31 13.01, POLYVINYL CHLORIDE (PVC) SEWER PIPE, AND SECTION 33 05 51, DUCTILE IRON PIPING & DUCTILE IRON & CAST IRON FITTINGS

A. Measurement:
1. The quantities of pipe sewers including unclassified excavation, for which payment will be allowed shall be expressed in linear feet for each size and type of pipe and applicable depth as shown in the Bid Form and shall be the horizontal length of sewer installed complete in place as measured along the centerline of the sewer with no deductions made

for tee connections or manholes. The applicable vertical depth shall be measured from the original ground surface to the invert of the sewer.

2. Reinforcing steel, rock excavation, standard bedding, and other sections of work not specifically listed in the Bid Form shall not be separately measured and paid for but costs for same shall be included in the unit price or lump sum price bid for other sections of work.

B. Payment:

1. Payment will be made at the linear foot price bid for each size and depth included in the Bid Form.
2. No separate payment shall be made for connections to existing sewers and to manholes, or inlets. The cost of this work shall be included in the unit price bid for other items of work.
3. No separate payment shall be made for any unclassified or borrow excavation, clearing, or backfill in connection with sewer line construction. The cost of these items shall be included in the unit prices bid for pipe sewers.
4. These amounts shall cover the cost of furnishing all materials, tools, labor, plant, equipment, services, and other expense in connection with common trench excavation and furnishing and installing all items of work herein specified and when so paid, shall constitute full compensation to the Contractor.

1.27 SECTION 33 31 13.02, ABOVE GROUND SEWERS

A. Measurement:

1. The quantities of steel pipe sewers for which payment will be allowed shall be expressed in linear feet for each size as shown in the Bid Form and shall be the horizontal length of steel pipe sewer installed complete-in-place as measured along the centerline of the sewer with no deductions made for couplings or manholes.
2. The quantities of ductile iron pipe sewers for which payment will be allowed shall be expressed in linear feet for each size as shown in the Bid Form and shall be the horizontal length of ductile iron pipe sewer installed complete-in-place as measured along the centerline of the sewer with no deductions made for joints, couplings or manholes.
3. For piers 6 feet or less in height, the quantities of treated timber piling including driving, pile caps, connections, timber framing, etc. for which payment will be allowed shall be expressed per each pier. A pier consists of the two (2) piles and all necessary framing, anchors, straps, etc. to provide one structural support system for the above ground pipe.
4. For piers more than 6 feet in height, the quantities of treated timber piling including driving pile caps, connections, timber framing, etc. for which payment will be allowed shall be expressed per each pier. A pier consists of the two (2) piles and all necessary framing, anchors, straps, etc. to provide one structural support system for the above ground pipe.
5. Measurement for pier height shall be from the ground surface to the top of the carrier pipe.

B. Payment:

1. Payment for ductile iron sewers constructed under these Specifications shall be made for the quantities determined in the manner specified above at the contract price per linear foot for each size of ductile iron pipe as listed in the Bid Form. Payment shall include all couplings, joints anchors, straps, etc. as required to complete the installation of the ductile iron pipe.

2. Payment for treated timber piers constructed under these Specifications shall be made for the quantities determined in the manner specified above at the contract price per each for piers less than 6 feet in height as listed in the Bid Form. Payment shall include all piles, timber framing, anchors, straps, bolts, etc. as required to complete the installation of the timber pier.
3. Payment for treated timber piers constructed under these Specifications shall be made for the quantities determined in the manner specified above at the contract price per each for piers greater than 6 feet in height as listed in the Bid Form. Payment shall include all piles, timber framing, anchors, straps, bolts, etc. as required to complete the installation of the timber pier.
4. Payment for concrete piers constructed under these Specifications shall be made for the quantities determined in the manner specified above at the contract price per each as listed in the Bid Form.

1.28 SECTION 33 42 13, DRAINAGE PIPE AND HEADWALLS

A. Separate payment will not be made for concrete sloped headwall or drainage pipe. Said payment to be included in the lump sum price bid for the Control/Lab Building.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 22 00

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SECTION 01 33 00 - SUBMITTALS

PART 1 - GENERAL

1.1 DESCRIPTION AND REQUIREMENTS

A. Type of Submittals. This Section of the Specifications describes the procedures for submittals of Schedule of Submittals, Schedule of Construction, Insurance Certificates, List of Subcontractors, Anticipated Payment Schedules, Shop Drawings, Product Data, Samples, and miscellaneous work-related submittals.

B. Related Work Specified Elsewhere:
   1. Definitions and Additional Responsible Parties:
      a. Section 00 72 00: General Conditions.
      b. Section 00 73 00: Supplementary Conditions.

C. Submittal Contents. The submittal contents required are specified in each section and in this specification.

D. Definitions. Submittals are categorized as follows:
   1. Shop Drawings:
      a. Shop drawings shall include technical data, drawings, diagrams, performance curves, schedules, templates, patterns, reports, calculations, instructions, measurements and similar information as applicable to the specific item for which the shop drawing is prepared.
      b. Provide newly-prepared information, on reproducible sheets, with graphic information at accurate scale (except as otherwise indicated) or appropriate number of prints hereof, with name of preparer (firm name) indicated. The Contract Drawings shall not be traced or reproduced by any method for use as or in lieu of detail shop drawings. Show dimensions and note which are based on field measurement. Identify materials and products in the work shown. Indicate compliance with standards and special coordination requirements. Do not allow shop drawing copies without appropriate final "Action" markings by the Engineer to be used in connection with the Work.
   2. Product Data:
      a. Product data includes standard printed information on materials, products and systems, not specially prepared for this project, other than the designation of selections from among available choices printed therein.
      b. Collect required data into one submittal for each unit of work or system, and clearly mark each copy to show which choices and options are applicable to project. Include manufacturer's standard printed recommendations for application and use, compliance with standards, application of labels and seals, notation of field measurements which have been checked, and special coordination requirements.
      c. Show all performance characteristics, capacities, clearances required, and wiring or piping diagrams. Supplement standard information to provide all information specifically applicable to work.
   3. Samples:

a. Samples include both fabricated and unfabricated physical examples of materials, products and units of work, both as complete units and as smaller portions of units of work, either for limited visual inspection or (where indicated) for more detailed testing and analysis.

b. Provide units identical with final condition of proposed materials or products for the work. Include "range" samples (not less than 3 units) where unavoidable variations must be expected, and describe or identify variations between units of each set. Provide full set of optional samples where the Engineer's selection is required. Prepare samples to match the Engineer's sample where indicated. Include information with each sample to show generic description, source or product name and manufacturer, limitations, and compliance with standards. Samples are submitted for review and confirmation of "kind" by the Engineer. Engineer will not "test" samples (expect as otherwise indicated) for other requirements, which are the exclusive responsibility of the Contractor.

c. Samples shall be of sufficient size to clearly indicate functional characteristics of the products and full range of color, texture, and pattern.

4. Miscellaneous submittals related directly to the work (non-administrative) include warranties, maintenance agreements, workmanship bonds, project photographs, survey data and reports, physical work records, statements of applicability, quality testing and certifying reports, copies of industry standards, record drawings, field measurement data, operating and maintenance materials, and similar information, devices and materials applicable to the Work but not processed as shop drawings, product data or samples.

E. List of Required Submittals:

No.	Description	Section No.
1.	List of Subcontractors	00 21 13
2.	Schedule of Submittals	00 72 00
3.	Insurance Certificates	00 72 00
4.	Schedule of Construction	00 72 00
5.	Cost Breakdown of Lump Sums	00 72 00
6.	Anticipated Payment Schedules	00 72 00
7.	Advertisement of Completion (Affidavit)	00 73 00
8.	Contractor’s Release of Liens	00 73 00
9.	Proof of Completed Operations Insurance	00 73 00
10.	Construction “As-Builts”	01 78 39
11.	Operation and Maintenance Data	01 78 23
12.	Chain Link Fencing	32 31 13
13.	Sanitary Sewer Manhole Coating	33 01 30.83
14.	Precast Manholes	33 05 13
15.	Polyvinyl Chloride (PVC) Pressure Pipe	33 05 50
16.	Ductile Iron Piping & Ductile Iron & Cast Iron Fittings	33 05 51
17.	Pipe and Fittings	33 05 53
18.	Polyvinyl Chloride (PVC) Sewer Pipe and Service Pipe	33 31 13.01
19.	System Pump Station Retrofits	33 32 19.31
20.	Recirculation Pump Station Retrofit	33 32 19.32
21.	Return Sludge Pump Station	33 32 21
22.	Sewer Service Connections	33 35 00
23.	Valves	40 05 51

1.2 GENERAL SUBMITTAL REQUIREMENTS

A. Scheduling. Where appropriate in various required administrative submittals (listings of products, manufacturers, supplier and subcontractors, and in job progress schedule), show principle work-related submittal requirements and time schedules for coordination and integration of submittal activity with related work in each instance.

B. Coordination of Submittal Times. Prepare and transmit each submittal to the Engineer sufficiently in advance of performing related work or other applicable activities, so the installation will not be delayed or improperly sequenced by processing times, including non-approval and resubmittal (if required). Coordinate with other submittals, testing, purchasing, delivery and similar sequenced activities. No extension of time will be authorized because of Contractor's failure to transmit submittals to the Engineer sufficiently in advance of the work.

C. Sequencing Requirements. As applicable in each instance, do not proceed with a unit of work until submittal procedures have been sequenced with related units of work, in a manner which will ensure that the action will not need to be later modified or rescinded by reason of a subsequent submittal which should have been processed earlier or concurrently for coordination.

D. Preparation of Submittals. Provide permanent marking on each submittal to identify project, date, Contractor, subcontractor, submittal name and similar information to distinguish it from other submittals. Show Contractor's executed review and approval marking and provide space for the Engineer's "Action" marking. Package each submittal appropriately for transmittal and handling. Submittals which are received from sources other than through the Contractor's office will be returned "without action".

E. Transmittal Identification.
1. Number transmittals in sequence for each Division of the Specifications. The number before the dash indicates the Section of the Specifications, and the number after the dash is the sequence number of the transmittal (33 11 00-1 would be the first transmittal applicable to Section 33 11 00 of the Specifications. 33 11 00-2 would be the second transmittal for Section 33 11 00, etc.)
2. Identify resubmittals with a letter of the alphabet following the original number, using A for the first resubmittal, B for the second resubmittal, etc. A resubmittal affecting transmittal 33 11 00-1 would then be numbered 33 11 00-1A. The 33 11 00-1 would then be entered in the space "Previous Transmittal Number", which is left blank except on resubmittals.

1.3 SPECIFIC CATEGORY REQUIREMENTS

A. General. Except as otherwise indicated in the individual work sections, comply with general requirements specified herein for each indicated category of submittal.
1. Submittals shall be accompanied by a cover sheet which shall contain:
a. The date of submission and the dates of any previous submissions.
b. The Project title and number.
c. Date.
d. Contract No.
e. The names of the:
1) Contractor

2) Supplier
3) Manufacturer

f. Identification of the product, with the Specification Section number.
g. A list of all the sheets included in the submittal.
h. Field dimensions, clearly identified as such.
i. Relation to adjacent or critical features of the work or materials.
j. Applicable standards, such as ASTM or Federal Specification numbers.
k. Notification to the Engineer in writing, at time of submission, of any deviations on the submittals from requirements of the Contract Documents.
l. Identification of revisions on resubmittals.
m. An 8 inch x 3 inch blank space for Contractor and Engineer stamps.
n. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of products, field measurements and field construction criteria, and coordination of the information within the submittal with requirements of the Work and of Contract Documents.
o. Submittal sheets or drawings showing more than the particular item under consideration shall have all but the pertinent description of the item for which review is requested crossed out.

1.4 CONTRACTOR RESPONSIBILITIES

A. In addition to any other requirements of this section, the Contractor shall be responsible to:
1. Review shop drawings, product data and samples prior to submission.
2. Determine and verify:
a. Field measurements.
b. Field construction criteria and required clearances.
c. Catalog numbers and similar data.
d. Conformance with specifications.
3. Coordinate each submittal with requirements of the work and of the Contract Documents.
4. Notify the Engineer in writing, at time of submission, of any deviations in the submittals from requirements of the Contract Documents.
5. Begin no fabrication or work which requires submittals until return of submittals with Engineer approval.

1.5 ROUTING OF SUBMITTALS

A. Submittals and routine correspondence shall be routed as follows:
1. Supplier to Contractor (through representative if applicable) for detailed review.
2. Contractor to Consulting Engineer for review or comment.
3. Consulting Engineer to Contractor.
4. Contractor to Field Office and Supplier.

1.6 SUBMITTAL COPIES REQUIRED

A. Shop Drawings, Product Data, and Miscellaneous Submittals. All released submittals will be distributed as follows:

1.	For Poly, Inc.	2 copies
2.	For Owner	2 copies
3.	For Contractor	3 copies
	TOTAL	7 copies

B. To the above number may be added additional copies as required by the Contractor.

C. The Engineer will mark all copies of each shop drawing. One will be retained in the Engineer's office, one sent to the Engineer's Field office, two will be retained for the Owner and the remaining copies sent to the Contractor for his records and distribution.

NOTE: Electronic submittals may be substituted for paper submittals with the approved of the Owner.

D. For nonapproval items, such as parts lists, operation and maintenance data, five (5) copies are required, unless specified otherwise:

1.	For Poly, Inc.	2 copies
2.	For Owner	2 copies
	TOTAL	4 copies

E. Samples
1. Submittal. At Contractor's option, provide preliminary submittal of a single set of samples for the Engineer's review and "action." Otherwise, initial submittal is final submittal unless returned with "action" which requires resubmittal. Submit two (2) sets of samples in final submittal; one set will be returned.
2. Quality Control Set. Maintain returned final set of samples at project site, in suitable condition and available for quality control comparisons by Engineer and by others.

1.7 REVIEW OF SUBMITTALS

A. Review Time. Allow a minimum of two (2) weeks for the Engineer's initial processing of each submittal requiring review and response, except allow longer periods where processing must be delayed for coordination with subsequent submittals or when a sufficiently large number of submittals are sent during a short period. The Engineer will advise the Contractor promptly when it is determined that a submittal being processed must be delayed. Allow two weeks for reprocessing each submittal. Advise the Engineer on each submittal as to whether processing time is critical to progress of the work, and therefore the work would be expedited if processing time could be foreshortened.

B. Engineer's Action:
1. Final Unrestricted Release. Work may proceed, provided it complies with contract documents, when submittal is returned with the following:
   a. Marking: "A" - No Exceptions Taken.
2. Final-But-Restricted Release. Work may proceed, provided it complies with notations and corrections on submittal and with contract documents, when submittal is returned with the following:
   a. Marking: "B" - Make Corrections Noted.
3. Returned for Resubmittal. Do not proceed with Work. Revise submittal in accordance with notations thereon, and resubmit without delay to obtain a different action marking.

Do not allow submittals with the following marking (or unmarked submittals where a marking is required) to be used in connection with performance of the work.

a. Marking: "C" - Revise and resubmit.
b. Marking: "D" - Rejected - Does Not Comply with Project Requirements.

4. Only three (3) copies of items marked "C" or "D" will be reviewed and marked. One copy will be retained in the Poly, Inc. office and the other copies with all remaining unmarked copies will be returned to the contractor for resubmittal.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 33 00

SECTION 01 35 24 - SAFETY

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. The Contractor shall be responsible for conducting all work in a safe manner and taking all necessary precautions to ensure the safety and protection of workers, property, and the general public. The Contractor's responsibility for protecting the public is described in the "General Conditions".

B. All construction work shall be conducted in accordance with the latest applicable requirements of 29CFR, Part 1926, Subpart P of the Occupational Safety and Health Act, Safety and Health Regulations for Construction, Section 107 of the Contract Work Hours and Safety Standards Act, as well as any other local and state safety codes and regulations.

C. The Contractor shall designate a trained and qualified employee who is to be responsible for ensuring that the work is performed safely and in conformance with all applicable regulations.

D. The Contractor shall determine for himself the safety hazards involved in prosecuting the work and the precautions necessary to conduct the work safely. If the Contractor is unsure as to any special hazards which may be unique on this project, it shall be his responsibility to hire a qualified professional to assist the Contractor in completing the project in a safe manner.

E. The Contractor shall bear all risks associated with performing the work and shall fully indemnify the Owner and Engineer.

F. All traffic control shall conform to the Manual on Uniform Traffic Control Devices published by the U.S. Department of Transportation, Federal Highway Administration.

1.2 MAINTENANCE OF TRAFFIC

A. General: No streets or roads shall be closed to traffic unless approved by the Owner and Engineer. Before approval will be granted, the Contractor shall submit a traffic accommodation plan and construction schedule satisfactory to the Owner and Engineer.

B. Lane Closures: Prior to closing any traffic lane, the Contractor shall furnish, erect and maintain, at no expense to the Owner, suitable barrels, cones, warning signs or other devices necessary to protect the safety of the public. If the traffic lane is to be closed during the night, suitable flares or lights shall be kept burning from sunset to sunrise.

C. Detours: Prior to closing any street or road to traffic, the Contractor shall furnish, erect, and maintain, at no expense to the Owner, suitable barricades, warning signs, flares, or lights which shall be kept burning from sunset to sunrise to keep traffic out of the area of construction and suitable signs saying “Detour” with directional arrows.

D. If in the opinion of the Engineer the Contractor does not comply with the above requirements, the Engineer and Owner may deem necessary such work to be performed by others and the charges therefore withheld from any money due or to become due to the Contractor.

1.3 PAYMENT

A. Compensation for complying with all safety provisions; furnishing, erecting, and maintaining the necessary detours, temporary structures, barricades, lights, flares, and signs; or for any other incidentals necessary for the good and proper safety, convenience, and direction of traffic during the period prior to final inspection and acceptance shall be made at the Lump Sum price bid in the Bid Proposal for Safety.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 35 24

SECTION 01 41 00 - REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Permits and Responsibilities. The Contractor shall, without additional expense to the Owner, be responsible for obtaining any necessary licenses and permits, and for complying with any applicable Federal, State and municipal laws, codes and regulations, in connection with the prosecution of the Work. He shall take proper safety and health precautions to protect the Work, the workers, the public and the property of others. He shall also be responsible for all materials delivered and work performed until completion and acceptance of the Work, except for any completed unit of construction thereof which may heretofore have been accepted.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 41 00

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SECTION 01 51 00 - TEMPORARY UTILITIES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Furnish, install and maintain temporary utilities required for construction; remove on completion of work.

1.2 REQUIREMENTS OF REGULATORY AGENCIES

A. Comply with National Electric Code.

B. Comply with Federal, State, and local codes and regulations and with utility company requirements.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Materials may be new or used, but must be adequate in capacity for the required usage, must not create unsafe conditions, and must not violate requirements of applicable codes and standards.

2.2 TEMPORARY ELECTRICITY AND LIGHTING

A. Arrange with utility company, provide service required for power and lighting and pay all costs for service and for power used.

B. Provide adequate artificial lighting for all areas of work when natural light is not adequate for work.

2.3 TEMPORARY HEAT AND VENTILATION

A. Provide temporary heat and ventilation as required to maintain adequate environmental conditions to facilitate progress of the work, to meet specified minimum conditions for the installation of materials, and to protect materials and finishes from damage due to temperature or humidity.

B. Provide adequate forced ventilation of enclosed areas for curing of installed materials, to disperse humidity, and to prevent hazardous accumulations of dust, fumes, vapors or gases.

C. Portable heaters shall meet all code requirements.

D. Pay all costs of installation, maintenance, operation and removal and for fuel used.

2.4 TEMPORARY TELEPHONE SERVICE

A. Arrange with local telephone service company and provide direct line telephone service at the construction site.
   1. One direct line instrument in the Engineer's Field Office.
   2. Other instruments at the option of the Contractor or as required by regulations.
   3. Pay all costs for installation, maintenance and removal and service charges for local calls. The Engineer will pay all toll charges made by the Engineer.

2.5 TEMPORARY WATER

A. Arrange with utility service company and provide water for construction purposes. Pay all costs for installation, maintenance and removal and all service charges for water.

2.6 TEMPORARY SANITARY FACILITIES

A. Provide sanitary facilities in compliance with laws and regulations.

B. Service, clean and maintain facilities and enclosures.

PART 3 - EXECUTION

3.1 GENERAL

A. Maintain and operate systems to assure continuous service.

B. Modify and extend systems as work progress requires.

3.2 REMOVAL

A. Completely remove temporary materials and equipment when their use is no longer required.

B. Clean and repair damage caused by temporary installations or use of temporary facilities.

END OF SECTION 01 51 00

SECTION 01 57 13.01 - TEMPORARY EROSION CONTROL FOR ALABAMA

PART 1 - GENERAL

1.1 SUMMARY

A. The work consists of implementing erosion control measures to prevent soil erosion, prevent sediment from leaving the site, and prevent sediment from entering streams or water bodies until permanent stabilization is established and a Notice of Termination (NOT) has been filed and accepted.

1.2 RELATED SECTIONS

A. Section 01 41 26.01 – ADEM NPDES Permit for Construction Activities.

B. Section 32 92 20 – Seeding and Sodding.

1.3 QUALITY ASSURANCE

A. Materials and construction methods for all erosion control measures shall be in strict conformance with the following:
   1. Alabama Handbook for Erosion Control, Sediment Control, and Stormwater Management on Construction Sites and Urban Areas, latest edition (Alabama Handbook).
   2. ADEM General NPDES Permit No. ALR100000 (NPDES Permit).
   3. ALDOT Standard Specifications for Highway Construction, latest edition, for work on ALDOT right-of-way.

1.4 SUBMITTALS

A. Submit in accordance with Section 01 33 00.

B. Product Data: For each product to be installed.

PART 2 - PRODUCTS

2.1 EROSION CONTROL MEASURES

A. Sediment control measures, erosion control measures, and other site management practices must meet or exceed the technical standards outlined in the Alabama Handbook. Where notes or details are provided in the Drawings that are more stringent than the Alabama Handbook, the most stringent requirements govern.

B. Unless specified otherwise by the Alabama Handbook, sediment control measures, erosion control measures, and other site management practices shall be designed and maintained to minimize erosion and maximize sediment removal resulting from a 2-year, 24-hour storm event.

PART 3 - EXECUTION

3.1 GENERAL

A. Erosion control measures shall be installed, inspected, and maintained per the Alabama Handbook and the NPDES Permit.

B. Maintain erosion control measures until all upstream disturbed areas have been permanently stabilized and a NOT has been filed and accepted.

C. The Contractor shall install and maintain effective erosion and sediment controls appropriate for site conditions to, at a minimum:
1. Control stormwater volume and velocity within the site to minimize soil erosion.
2. Control stormwater discharges, including both peak flow rates and total stormwater volume, to minimize erosion at outlets, and to minimize downstream channel and streambank erosion.
3. Minimize the amount of soil exposed during construction activity through the use of project phasing or other appropriate techniques.
4. Minimize the disturbance of steep slopes, unless infeasible.
5. Minimize sediment discharges from the site.
6. Minimize the generation of dust.
7. Minimize all stream crossings.
8. Stabilize all construction entrances and exits and minimize off-site tracking of sediment from vehicles.
9. Where applicable, install storm drain inlet protection measures to further prevent sediment discharges.
10. Provide and maintain natural buffers around surface waters, direct stormwater to vegetated areas to increase sediment removal and maximize stormwater infiltration, unless infeasible.
11. Minimize soil compaction and, unless infeasible, preserve topsoil.
12. Implement measures or requirements to achieve the pollutant reductions consistent with a TMDL finalized or approved by EPA. Applicable TMDLs are located and/or can be accessed at http://adem.alabama.gov/programs/water/approvedTMDLs.htm.

3.2 FIELD QUALITY CONTROL

A. Maintain temporary and permanent vegetation, erosion and sediment control measures, and other protective measures in good and effective operating condition.

B. Perform routine inspections and maintenance as required by the Alabama Handbook and NPDES Permit.

3.3 CLEANUP AND REMOVAL

A. When all upstream disturbed areas have been permanently stabilized and a NOT has been filed and accepted, all temporary erosion control measures and their accumulated sediment shall be removed. Any areas disturbed as a result of the removal process shall be permanently stabilized.

END OF SECTION 01 57 13.01

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SECTION 01 61 00 - GENERAL MATERIALS STIPULATIONS

PART 1 - GENERAL

1.1 SCOPE

A. These General Materials Stipulations apply, in general, to all equipment and piping. They supplement the detailed specifications, but in case of conflict, the detailed specifications shall govern.

1.2 COORDINATION

A. The Contractor shall assume full responsibility for the coordination of the installation of all materials and products furnished under these Contract Documents. The Contractor shall be completely responsible for verification that all structures, piping and components furnished by him and/or his Subcontractors and Suppliers are compatible. The Contractor shall start up each system and shall make all necessary adjustments to place each system in proper operating condition.

1.3 PATENT ROYALTIES

A. All royalties and fees for patents covering materials, articles, apparatus, devices, or equipment shall be included in prices bid by the Contractor. Attention is directed to the requirements of the "General Conditions" concerning patents.

1.4 GUARANTEE

A. The Contractor shall guarantee all material against faulty or inadequate design, improper assembly or erection, defective materials, defective workmanship breakage or other failure. The guarantee period shall be defined in The General Conditions.

1.5 WORKMANSHIP AND MATERIALS

A. All material shall be designed, fabricated, and assembled in accordance with the best modern engineering and shop practice. Individual parts shall be manufactured to standard sizes and gages so that repair parts, furnished at any time, can be installed in the field. Like parts of duplicate units shall be interchangeable. Material shall be new and shall not have been in service at any time prior to delivery, except as required by tests.

B. Materials shall be suitable for service conditions. Iron castings shall be tough, close grained, gray iron free from blowholes, flaws, or excessive shrinkage and shall conform to ASTM A 48, Class 30 minimum. Plugging of defective castings shall not be permitted. Castings shall be annealed to remove internal stresses prior to machining and shall have the mark number and heat number cast on them.

C. Except where otherwise specified, structural and miscellaneous fabricated steel shall conform to the Standards of the American Institute of Steel Construction.

1.6 SHOP PRIMING AND PAINTING

A. All iron and carbon steel surfaces of shop fabricated equipment and all ferrous and nonferrous surfaces specified to be shop primed or painted shall be painted in the shop with one or more coats of primer.

B. All surfaces to be primed in the shop shall have all rust, mill scale, grease, oils, mud, dirt, welding flux, slag, weld spatter, and other foreign material removed after fabrication and prior to application of primer. Welds shall be scraped, chipped, and brushed as necessary to remove all embedded slag or weld spatter. Sharp edges of cut or sheared edges shall be dulled by at least one pass of a power grinder to improve paint adherence. Surface preparation prior to shop priming shall conform to that specified in the detailed equipment specifications. Where surface preparation prior to shop priming is not otherwise specified, iron and carbon steel surfaces that will not be placed in immersion service shall be given a commercial blast cleaning in accordance with Steel Structures Painting Council Specification SP-6. Iron and carbon steel surfaces that will be placed in immersion service shall be blasted in accordance with SSPC-SP 10 Near White Blast Cleaning. Galvanized, aluminum and stainless steel surfaces shall be abrasive blasted in accordance with SSPC-SP 7 Brush Off Blast Cleaning producing a minimum anchor profile of 1.0 mil. Copper surfaces shall be cleaned with a mild solution of phosphoric acid and buffed or polished to a bright finish. Cleaned surfaces shall be primed immediately after cleaning. Sand-blasting shall not be permitted on electrical or mechanical equipment after assembly. Sandblasting shall achieve an anchor pattern or blast profile of between 30 and 40 percent of the dry film thickness of the first applied coat of primer.

C. Primers shall be applied with suitable brushes, rollers, or spray equipment at a rate of application not to exceed the manufacturer's recommended rate for the surface being painted. Primer shall not be applied in areas where there is an excessive amount of dust present in the air. Primer shall be mixed, stored, and applied in strict adherence to the manufacturer's recommendations. Primed surfaces shall be smooth and free of brush marks, streaks, laps, runs, or skipped or missed areas. Special care shall be taken to ensure that all cracks, corners, and crevices are filled with primer. Shop primed materials shall not be handled or assembled until the shop coating is dry and hard.

D. Where shop primers are not otherwise specified, iron and carbon steel surfaces shall be coated with one coat of NSF approved, organic zinc rich urethane primer equal to Tnemec Series 91 H20 Hydro-Zinc applied to achieve a minimum dry film thickness of 2.5 mils. Galvanized, stainless steel and aluminum surfaces shall be coated with one coat of polyamide epoxy primer equal to Tnemec Series 20 Pota-Pox applied at a rate to achieve 2.0 mils minimum.

E. Unless otherwise specified, miscellaneous iron castings shall be given a commercial blast cleaning and coated in the shop with one coat of Polyamidoamine epoxy applied to a minimum dry film thickness of 6.0 mils. Polyamidoamine epoxy shall equal Tnemec Series N140-1211 Pota-Pox Plus.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 61 00

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SECTION 01 66 00 - STORAGE AND PROTECTION

PART 1 - GENERAL

1.1 GENERAL

A. Material shall be received, inspected, unloaded, handled, stored, maintained, and protected by the Contractor in a suitable location on or off site, if necessary, until such time as installation is required.

B. All equipment shall be boxed, crated, or otherwise completely enclosed and protected during shipment, handling, and storage. All equipment shall be protected from exposure to the elements and shall be kept thoroughly dry at all times. All equipment shall be stored above ground level and adequately supported on wood blocking or other approved support material. Printed storage instructions of the manufacturer shall be strictly adhered to.

C. Painted, anodized, or otherwise coated surfaces shall be protected against impact, abrasion, discoloration, and other damage. All coated surfaces which are damaged prior to acceptance of shall be cleaned and coated painted to the satisfaction of the Engineer with the same or equivalent coating used in the original application.

1.2 STORAGE

A. The Contractor shall be responsible for providing satisfactory storage facilities which are acceptable to the Engineer. In the event that satisfactory facilities cannot be provided on site, satisfactory warehouse, acceptable to the Engineer, will be provided by the Contractor for such time until the equipment, materials, and products can be accommodated at the site.

B. Equipment, materials and products which are stored in a satisfactory warehouse acceptable to the Engineer will be eligible for progress payments as though they had been delivered to the job site.

C. The Contractor shall be responsible for the maintenance and protection of all equipment, materials, and products placed in storage and shall bear all costs of storage, preparation for transportation, rehandling, and preparation for installation.

D. Equipment and products stored outdoors shall be supported above the ground on suitable wooden blocks or braces arranged to prevent excessive deflection or bending between supports. Items such as pipe, structural steel, and sheet construction products shall be stored with one end elevated to facilitate drainage.

E. Tarps and other coverings shall be supported above the stored equipment or materials on wooden strips to provide ventilation under the cover and minimize condensation. Tarps and covers shall be arranged to prevent ponding of water.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 66 00

SECTION 01 74 13 - CLEANING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Execute cleaning during progress of the work, at completion of the work and as required by General Conditions.

1.2 DISPOSAL REQUIREMENTS

A. Conduct cleaning and disposal operations to comply with codes, ordinances, regulations, and anti-pollution laws.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Use only those cleaning materials which will not create hazards to health or property and which will not damage surfaces.

B. Use only those cleaning materials and methods recommended by manufacturer of the surface material to be cleaned.

C. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 - EXECUTION

3.1 DURING CONSTRUCTION

A. Execute periodic cleaning to keep the work, the site and adjacent properties free from accumulations of waste materials, rubbish and windblown debris, resulting from construction operations.

B. Provide on-site containers for the collection of waste materials, debris and rubbish.

C. Remove waste materials, debris and rubbish from the site periodically and dispose of at legal disposal areas away from the site.

3.2 DUST CONTROL

A. Clean interior spaces prior to the start of finish painting and continue cleaning on an as-needed basis until painting is finished.

B. Schedule operations so that dust and other contaminants resulting from cleaning process will not fall on wet or newly coated surfaces.

3.3 FINAL CLEANING

A. Employ skilled persons for final cleaning.

B. Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels, and other foreign materials from sight-exposed interior and exterior surfaces.

C. Wash and shine glazing and mirrors.

D. Polish glossy surfaces to a clear shine.

E. Ventilating Systems:
   1. Clean permanent filters and replace disposable filters if units were operated during construction.
   2. Clean ducts, blowers and coils if units were operated without filters during construction.

F. Broom clean exterior paved surfaces; rake clean other surfaces of the grounds.

G. Prior to final completion, or Owner occupancy, Contractor shall conduct an inspection of sight-exposed interior and exterior surfaces, and all work areas, to verify that the entire work is clean.

END OF SECTION 01 74 13

SECTION 01 77 19 - CONTRACT CLOSEOUT

PART 1 - GENERAL

1.1 DESCRIPTION

A. Comply with requirements stated in General, Supplemental and Special Conditions and in Specifications for administrative procedures in closing out the work.

B. Related requirements in other parts of the Project Manual:
   1. Fiscal provisions, legal submittals and additional administrative requirements: General Supplemental and Special Conditions.

C. Related requirements specified in other sections:
   1. Section 01 74 23: Cleanup
   2. Section 01 78 39: Record Documents
   3. Section 01 78 23: Operating and Maintenance Data

1.2 SUBSTANTIAL COMPLETION

A. When Contractor considers the work is substantially complete, he shall submit to Engineer:
   1. A written notice that the work, or designated portion thereof, is substantially complete.
   2. A list of items to be completed or corrected.

B. Within a reasonable time after receipt of such notice, Engineer will make an inspection to determine the status of completion.

C. Should Engineer determine that the work is not substantially complete:
   1. Engineer will promptly notify the Contractor in writing, giving the reasons therefor.
   2. Contractor shall remedy the deficiencies in the work, and send a second written notice of substantial completion to the Engineer.
   3. Engineer will reinspect the work.

D. When Engineer finds that the work is substantially complete, he will:
   1. Prepare and deliver to Owner a tentative letter of Substantial Completion with a tentative list of items to be completed or corrected before final payment.
   2. After consideration of any objections made by the Owner as provided in General, Supplemental and Special Conditions, and when Engineer considers the work substantially complete, he will execute and deliver to the Owner and the Contractor a definite Letter of Substantial Completion with a revised tentative list of items to be completed or corrected.

1.3 FINAL INSPECTION

A. When Contractor considers the work is complete, he shall submit written certification that:
   1. Contract Documents have been reviewed.

2. Work has been inspected for compliance with Contract Documents.
3. Work has been completed in accordance with Contract Documents.
4. Equipment and systems have been tested in the presence of the Owner's representative and are operational.
5. Work is completed and ready for final inspection.

B. Engineer will make an inspection to verify the status of completion with reasonable promptness after receipt of such certification.

C. Should Engineer consider that the work is incomplete or defective:
1. Engineer will promptly notify the Contractor in writing, listing the incomplete or defective work.
2. Contractor shall take immediate steps to remedy the stated deficiencies, and send a second written certification to Engineer that the work is complete.
3. Engineer will reinspect the work.

D. When the Engineer finds that the work is acceptable under the Contract Documents, he shall request the Contractor to make closeout submittals and begin project Advertisement of Completion.

1.4 REINSPECTION FEES

A. Should the Engineer perform reinspections due to failure of the work to comply with the claims of status of completion made by the Contractor:
1. Owner will compensate Engineer for such additional services.
2. Owner will deduct the amount of such compensation from the final payment to the Contractor.

1.5 CONTRACTOR'S CLOSEOUT SUBMITTALS TO ENGINEER

A. Section 01 78 39: Project Record Documents

B. Section 01 79 00: Warranties and Bonds as required.

C. Spare Parts and Maintenance Materials as required.

D. Release of Liens - A certified letter from the Contractor (as shown in this section) to release and discharge the Owner, its officers, agents and employees of and from all liabilities, obligations, and claims under or arising out of said contract.

E. Completed Operations Insurance - Submit certificates of completed operations insurance coverage for a period of one year from the date of acceptance of the work by the Owner or the date of payment of the final amounts owed the Contractor by the Owner whichever occurs first.

F. Contractor's Advertisement of Completion - The Contractor immediately after being notified by the Engineer that all other requirements of his contract have been completed shall give notice of said completion by an advertisement (as shown in this section) for a period of four (4) successive weeks in some newspaper of general circulation published within the county or counties where the work is performed. Proof of publication of said notice shall be made by the

Contractor to the Owner, by affidavit of the publisher and a printed copy of the published notice. If no newspaper is published in any county where the work is done, the notice may be given by posting at the Court House for 30 days and proof of same shall be made by the Probate Judge or Sheriff and the Contractor.

1.6 FINAL ADJUSTMENT OF ACCOUNTS

A. Submit a final settlement of accounting to Engineer.

B. Statement shall reflect all adjustments to the Contract Sum:
   1. The Original Contract Sum.
   2. Additions and deductions resulting from:
      a. Previous Change Orders
      b. Unit Prices
      c. Deductions for uncorrected work
      d. Penalties and Bonuses
      e. Deductions for liquidated damages
      f. Deductions for reinspection payments
      g. Other adjustments
   3. Total Contract Sum, as adjusted.
   4. Previous Payments
   5. Sum remaining due

C. Engineer will prepare a final change order, reflecting approval adjustments to the Contract Sum which were not previously made by Change Orders.

1.7 FINAL APPLICATION FOR PAYMENT

A. Contractor shall submit the final Application for Payment in accordance with procedures and requirements stated in the Conditions of the Contract. Included in the Final Application For Payment shall be the affidavit of the Advertisement For Completion, Release of Liens, and Proof of Completed Operations Insurance.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

ADVERTISEMENT OF COMPLETION

_____ (Contractor)

_____ (Address)

gives notice of completion of Contract 1 – Treatment and Collection System Improvements/CWSRF No. CS010864-02/City of Brundidge, Alabama (Project) and sets _____ as the date of final settlement. All persons and firms should file all claims for payment to the below address prior to the settlement date:

City of Brundidge (Owner)

c/o Poly, Inc.

PO Box 837

Dothan, AL 36302

By: _____ (Name)

_____ (Title)

Leg: _____ (Publication Dates)

CONTRACTOR'S RELEASE OF LIENS

STATE OF: _____

COUNTY OF: _____

Before me, the undersigned Notary Public, in and for the said County and State personally appeared _____, representing the Contractor, _____, who being duly sworn according to law deposes and says that all labor, materials, and outstanding claims and indebtedness of whatever nature arising out of the performance of the Contract with the City of Brundidge, the Owner, for Contract 1 – Treatment and Collection System Improvements/CWSRF No. CS010864-02, have been paid in full and that for the final payment in the amount of $_____, the Contractor releases and discharges the Owner and his authorized representatives from any liens or claims of any nature because of or arising from this contract and/or its performance which it has had, has, or may have in the future.

By: _____

Sworn to and subscribed before me this

_____ day of _____, 20____.

_____

Notary Public Signature

My Commission Expires _____

END OF SECTION 01 77 19

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SECTION 01 78 23.01 - OPERATION AND MAINTENANCE DATA - SHORT FORM

PART 1 - GENERAL

1.1 DESCRIPTION

A. The Contractor shall provide five (5) copies of a complete and comprehensive referenced manual containing operating and maintenance data to enable operators and plant engineers to correctly operate, service, and maintain all equipment and accessories covered by the detailed equipment specifications. The data contained in the manual shall explain and illustrate clearly and simply all principles and theory of operation, operating instructions, maintenance procedures, calibration procedures, and safety precautions and procedures for the equipment involved. Safety precautions and procedures shall be stressed.

1.2 SUBMITTAL

A. The Contractor shall submit to the Engineer for approval two (2) preliminary copies of the data reference manual with all specified material before the work covered by these Contract Documents is 50 percent complete. No payment for greater than 50 percent of the Contract Price will be made until all the preliminary copies of the manual are submitted and the submittal is satisfactory to the Engineer. Before the work is 80 percent complete, the Contractor shall submit five (5) copies of each manual complete in detail as specified below. No payment for more than 80 percent of the Contract Price will be made until all the final copies of the manuals are submitted and the submittal is satisfactory to the Engineer. The Engineer will notify the Contractor in writing of any deficiencies in the manual and will return the manual for completion and/or correction. The Contractor shall submit five (5) copies of any revised or additional data required to complete the manual or as required by the Engineer.

B. At the time of the inspection for substantial completion, the Engineer will notify the Contractor of any revisions, corrections or incomplete data required for the satisfactory completion of the Operating and Maintenance Data Reference Manual. The Engineer will not recommend final acceptance of the work or final payment until the Operating and Maintenance Data Reference Manual is complete and satisfactory to him.

1.3 CONTENTS OF OPERATING AND MAINTENANCE DATA REFERENCE MANUAL

A. The operating and Maintenance Data Reference Manual shall contain, but is not limited to, the following information on all equipment and accessories furnished and installed under these specifications.
   1. Equipment function, normal operating characteristics, and limiting conditions for all equipment furnished.
   2. Detailed assembly, installation, alignment, adjustment, and checking instructions for all equipment furnished.
   3. Detailed operating instructions for start-up, calibration, routine and normal operation, regulation and control, shutdown and emergency conditions for all equipment furnished.

4. Detailed lubrication instructions and schedules for all equipment furnished including identification of lubricant (description, specification and trade name of at least two manufacturers), diagrams illustrating lubrication points.
5. Detailed guide to "troubleshooting" for all equipment furnished.
6. Detailed parts list identified by generic title, materials of construction and part number (actual manufacturer's number, not Supplier's) list of recommended spare parts identified as specified above, and predicted life of parts subject to wear, and an exploded view of each equipment assembly for all equipment furnished.
7. Detailed disassembly, overhaul, and reassembly instructions for all equipment furnished.
8. Electrical and instrumentation schematics for all equipment furnished, including motor control centers, control panels, instrument panels, and analyzer panels.
9. List of all special tools supplied and description of their use for all equipment furnished. Special tools include any tool not normally available in an industrial hardware or mill supply house.
10. Detailed preventive maintenance procedures and schedules for all equipment furnished.
11. Detailed list of settings for relays, pressure switches, temperature switches, level switches, thermostats, alarms, relief valves, rupture discs, etc.
12. One copy of all record shop drawings and engineering data for all equipment furnished.
13. Performance and characteristics operating curves for all equipment furnished.
14. List of names and addresses of nearest service centers for parts, overhaul, and service.
15. Three (3) copies of any instructions and parts list attached to equipment when delivered.
16. Procedures for storing, handling, and disposing of any chemicals or products used with the equipment or system.
17. The suppliers O&M information will address the particular equipment furnished with specific details on operation and maintenance practices. General data will not be accepted.
18. No separate payment will be made for the Operating and Maintenance Data Reference Manual and the cost of said manual shall be included in the Contract Price.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 78 23.01

SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Maintain at the site for the Owner one record of:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other Modifications to the Contract.
   5. Engineer Field Orders or written instructions.
   6. Approved Shop Drawings, Product Data and Samples.
   7. Field Test Records.

1.2 RELATED WORK ELSEWHERE

A. Section 01 33 00: Submittals

1.3 MAINTENANCE OF DOCUMENTS AND SAMPLES

A. Store documents and samples in Contractor's field office apart from documents used for construction.
   1. Provide files and racks for storage of documents.
   2. Provide locked cabinet or secure storage space storage samples.

B. File documents and samples in accordance with Data Filing Format of the Uniform Construction Index.

C. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.

D. Make documents and samples available at all times for inspection by Engineer.

1.4 RECORDING

A. Label each document "PROJECT RECORD" in neat large printed letters.

B. Record information concurrently with construction progress. Do not conceal any work until required information is recorded.

C. Drawings: Legibly mark to record actual construction:
   1. Depths of various elements of foundation in relation to finish first floor datum.
   2. Horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.

3. Location of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.
4. Field changes of dimension and detail.
5. Changes made by Field Order or by Change Order.
6. Details not on original contract drawings.

D. Specifications and Addenda: Legibly mark each Section to record:
1. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.
2. Changes made by Field Order or by Change Order.

1.5 SUBMITTALS

A. At Contract closeout, deliver Record Documents to Engineer for the Owner.

B. Accompany submittal with transmittal letter in duplicate, containing:
1. Date
2. Project title and number
3. Contractor's name and address
4. Title and number of each Record Document
5. Signature of Contractor or his authorized representative.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 78 39

SECTION 01 79 00 - WARRANTIES AND BONDS

PART 1 - GENERAL

1.1 PROJECT MAINTENANCE AND WARRANTY

A. Maintain and keep in good repair the improvements covered by these drawings and specifications during the life of the Contract.

B. Indemnify the Owner against any repairs which may become necessary to any part of the work performed and to items of equipment and systems procured for or furnished under this Contract, arising from defective workmanship or materials used therein, for a period of one (1) year after acceptance from the final date of final resolution of the Owner accepting work.

C. The Contractor shall not be obligated to make replacements which become necessary because of ordinary wear and tear, or as a result of improper operation or maintenance, or as a result of improper work or damage by another Contractor or the Owner, or to perform any work which is normally performed by a maintenance crew during operation.

D. In the event of failure due to faulty materials, equipment or installation prior to the expiration of the one-year warranty described above, the affected unit shall be disassembled, inspected, and modified or replaced as necessary to prevent further occurrences. All related components which may have been damaged or rendered non-serviceable as a consequence of the failure shall be replaced. A new 12 month warranty against defective or deficient materials, equipment and installation shall commence on the day that the item is reassembled and placed back into operation. The new 12-month warranty shall also include but not be limited to all items disassembled or removed to facilitate repairs. Failures may include, but are not limited to, cracked or broken housings, piping, or vessels, excessive deflections, bent or broken shafts, broken or chipped gear teeth, premature bearing failure, excessive wear, vibration or excessive leakage around seals. Failures which are directly and clearly traceable to operator abuse, such as operations in conflict with published operating procedures, or improper maintenance, such as substitution of unauthorized replacement parts, use of incorrect lubricants or chemicals, flagrant over or under-lubrication, and using maintenance procedures not conforming with published maintenance instructions, shall be exempted from the scope of the one-year warranty.

   Should multiple failures occur during a warranty period, all products of the same size and type shall be disassembled, inspected, modified or replaced, as necessary and rewarranted for one year. As used herein, multiple failures shall be interpreted to mean two (2) or more failures of the same kind in the same item or failures of the same kind in two (2) or more items of the same type.

   The Contractor shall be responsible for any expenses incurred by the Owner arising out of any repairs made during the warranty period(s). Expenses may include but are not limited to water purchases, equipment rentals and loss of income.

E. The Contractor shall, at his own expense, furnish all labor, materials, tools and equipment required and shall make such repairs and removals or shall perform such work or reconstruction

as may be made necessary by any structural or functional defect or failure resulting from neglect, faulty workmanship or faulty materials, in any part of the Work performed by him. Such repair shall also include refilling of trenches, excavations or embankments which show settlement or erosion after backfilling or placement.

F. Except as noted on the Drawings or as specified, all structures such as embankments and fences shall be returned to their original condition prior to the completion of the Contract. Any and all damage to any facility not designated for removal, resulting from the Contractor's operations, shall be promptly repaired by the Contractor at no cost to the Owner.

G. The Contractor shall be responsible for all road and entrance reconstruction and repairs and maintenance of same for a period of one year from the date of such reconstruction. In the event the repairs and maintenance are not made immediately and it becomes necessary for the Owner of the road to make such repairs, the Contractor shall reimburse the Owner of the road for the cost of such repairs.

H. In the event the Contractor fails to proceed to remedy the defects of which he has been notified within 15 days of the date of such notice, the Owner reserves the right to cause the required materials to be procured and the work to be done, as described in the drawings and specifications, and to hold the Contractor and the sureties on his bond liable for the cost and expense thereof.

I. Notice to Contractor for repairs and reconstruction will be made in the form of a registered letter addressed to the Contractor at his home office.

J. Neither the foregoing paragraphs nor any provision in the Contract Documents, nor any special guarantee time limit implies any limitation of the Contractor's liability with the law of the place of construction.

K. The Contractor shall provide the Owner copies of all manufacturers warranties for materials, equipment, parts and components installed under this contract. The copies shall list the model number, part number, serial number of the covered items as well as the item’s installation location. Copies of material warranties shall also include the name and address of the manufacturer of each warranty item.

Copies of warranties shall be bound in loose leaf form with a cover sheet and table of contents indicating item description and page number.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 79 00

SECTION 32 20 10 - REPLACEMENT PAVING, DRIVEWAYS, AND SIDEWALKS

PART 1 - GENERAL

1.1 RELATED WORK ELSEWHERE

A. Section 31 00 01 – Earthwork for Utilities

1.2 SCOPE

A. The work to be performed under this section shall consist of replacing existing sidewalks and pavement in paved streets and driveways where such sidewalks and pavement have been removed for constructing pipelines, manholes, and all other appurtenances and structures.

1.3 SUBMITTALS

A. Submit product data on prime and tack, asphaltic concrete materials, paint materials and pavement markers.

B. Submit mix designs on each type of asphaltic concrete.

C. Submit in accordance with Section 01 33 00.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cement: Conform to the requirements of Section 501 - Cement of the Alabama Standard Specifications for Highway Construction, 2012 Edition.

B. Bituminous Prime and Tack: Conform to the requirements of Section 401 - Bituminous Surface Treatments of the Alabama Standard Specifications for Highway Construction, 2012 Edition.

C. Asphaltic Concrete Materials: Conform to the requirements of Section 410 - Hot Mix Asphaltic Pavements of the Alabama Standard Specifications for Highway Construction, 2012 Edition.

D. Traffic Line Stripe, Traffic Control Markings, and Pavement Markers: Conform to the requirements of Sections 701, 703, and 705 of the Alabama Standard Specifications for Highway Construction, 2012 Edition.

2.2 CRUSHED STONE SELECT FOUNDATION MATERIAL

A. Crushed stone size 67 conforming to Section 801, State of Alabama Standard Specifications for Highway Construction, 2012 Edition.

PART 3 - EXECUTION

3.1 TYPES OF PAVEMENTS

A. All existing pavement in streets or driveways which is removed, destroyed, or damaged by construction shall be replaced with the same type of pavement (portland cement pavement, bituminous concrete pavement or gravel) as that which existed before construction work was started unless shown otherwise on the Drawings. Materials, equipment, and construction methods used for paving work shall conform to the State Department of Transportation specifications applicable to the particular type required for replacement, repair, or new pavements.

B. Portland cement concrete pavement shall be replaced with concrete in accordance with paragraph 2.1.A of these Specifications. The surface finish of the concrete pavement replaced shall conform to that of the existing pavement. The surface of the replaced concrete base course shall be left rough. The slab shall be of depth equivalent to the existing concrete pavement or base course, but in no case less than 6 inches thick. Expansion joints removed shall be replaced. Concrete pavements or concrete base courses shall be reinforced and shall conform to details shown on the Drawings and applicable specification, Portland Cement Concrete Pavement, Section 501, Alabama Standard Specifications for Highway Construction, 2012 Edition.

C. Bituminous concrete pavement shall be replaced with fine aggregate bituminous concrete conforming to Section 424, Superpave Bituminous Concrete Base Binder, and Wearing Surface Layers, Alabama Standard Specifications for Highway Construction, 2012 Edition. The pavement mixture shall not be spread until the designated surface has been previously cleaned and prepared, is intact, firm, properly cured, dry, and the tack coat has been applied. The mix shall be designed on the fine side of the restricted zone.

D. Gravel Pavement: Where sewerage lines and appurtenances are constructed in or across unpaved, chert, or crushed stone surfaced streets, roadways or driveways, or when a temporary crushed stone surface is called for in a paved street, the surface removed or damaged shall be repaired or replaced with a minimum of 6 inches of crushed stone in accordance with the section of these specification titled “EARTHWORK”.

3.2 REMOVAL AND REPLACEMENT OF ASPHALT PAVEMENT (PATCHING)

A. Where sewerage lines and appurtenances are constructed in existing paved streets, the pavements shall be removed and replaced in accordance with the following procedure:
   1. The existing street pavement or surface shall be neatly and squarely cut and removed along the line of the work for the width required for the trench or structure.
   2. Immediately following sewer installation, trench backfill shall be compacted for the full depth of the trench as specified in the section of these specifications titled “EARTHWORK”.

3. Trench backfill along paved streets and driveways shall include 9-1/2 inches of sand-clay or 7-1/2 inches of No. 67 Crushed Stone as a temporary surfacing of the trenches. This temporary surface shall be installed level with the existing asphalt surface and shall be maintained dust-free by the Contractor until compaction tests are performed and the replacement pavement is placed.
4. if the street is to be resurfaced following patching, the asphalt surface shall be replaced within 5 days after backfill is placed. If not, the asphalt surface shall be replaced within 30 days after backfill is placed.
5. When temporary sand-clay or crushed stone surface is considered by the Engineer to be sufficient to be used as base, the surface shall be graded smooth and to the proper elevation. If adjacent undisturbed paving remains, the proper elevation is that which will make the final surfacing level with the adjacent surfacing that was undisturbed. If the entire street is to be resurfaced later, the proper elevation is such that the new paving will be at the same elevation as that removed. Then compaction tests shall be performed. One (1) proctor density and one (1) field density test shall be performed at approximately 500 foot intervals at points selected by the Engineer plus one (1) field density test at each manhole. Minimum requirement for compaction shall be 98% of the maximum density at the optimum moisture as determined by AASHTO T-180, Method A (Modified Proctor) for sand-clay, and for crushed stone shall be 83% of the solid volume density determined from the bulk specific gravity by AASHTO T-84 and T-85 and the dry weight of the aggregate.
6. If the temporary sand-clay or crushed rock surface is to be replaced, it shall be removed and new sand-clay or crushed stone base shall be placed and tested as described above. Crushed stone base shall be placed and allowed to sit for three (3) days before concrete base and/or pavement surface courses are applied.
7. A prime coat consisting of a single application of bituminous material shall be applied to the prepared base. No prime coat shall be applied until the preparation of the old surface has been approved by the Engineer. Before applying prime, the surface shall be swept clean and all loose and foreign matter removed. Method of material application for prime shall conform to the requirements as set forth in Section 401 of the Alabama Standard Specifications for Highway Construction, 2012 Edition.
8. Following application of prime, a surface course shall be applied. This item shall consist of a bituminous plant mix wearing surface applied in accordance with Section 410 of the Alabama Standard Specification for the Highway Construction, 2012 Edition. The plant mix surface shall be placed at a minimum rate of 165 lbs/s.y. unless shown otherwise on the drawings.
9. If the street is to be subsequently resurfaced, the replaced asphalt shall be allowed to sit subject to weather and traffic until it has completely settled before the resurfacing takes place.
10. Wherever sewer lines are constructed across state highways, the Contractor shall comply with all requirements and provisions of the Standard Method of the State Department of Transportation for opening trenches through highways and replacing pavements as shown on the Drawings and specified herein. All such work shall be subject to inspection and approval by the State Department of Transportation.
11. Contractor shall remove all surplus excavation materials and debris and overspray of prime or tack from the street surfaces and rights-of-way and shall restore street, roadway, or sidewalk surfacing to its original condition. This work shall be done immediately following placement of asphalt and shall be considered as cleanup and no separate payment will be made for this item.

3.3 RESURFACING OF PATCHED STREETS AND PAVED AREAS

A. Where called for on the Plans or in the Specifications full-width bituminous resurfacing shall be applied in addition to asphalt patching. Full-width bituminous resurfacing shall consist of either pulverizing the existing asphalt, reworking the base and placing a wearing surface or placing a leveling course and wearing surface.

B. Pulverized In-situ Material Base Course: This item shall consist of mixing by pulverizing the existing asphalt surface and base material to provide a foundation course for a surface course or pavement.
   1. The pulverized base course shall be in accordance with these specifications and in conformity with the lines, grades, thicknesses, and typical cross-sections shown on the plans or as designated by the Engineer. The work covered shall consist of furnishing all labor, equipment, and operation required to mix, shape water and compact the in-situ materials base course in accordance with the plans and specifications thereof. The base course shall be processed by thoroughly pulverizing, blending, and mixing until uniform in texture and appearance, the existing asphalt surface and base material. The material shall then be shaped, watered and compacted. Density requirements for compaction shall be 98% of the maximum density at optimum moisture content as measured by AASHTO T-180, Method A (Modified Proctor). The section and density shall be maintained until placement of the surface course.
   2. Prime Coat: The bituminous treatment shall consist of a prime coat composed of a single application of bituminous material on a prepared base course. No prime coat shall be applied until base course has been approved by the Engineer. Before applying prime, the surface shall be swept clean and sprinkled with water if directed by the Engineer. Care shall be taken to keep prime off curb and gutter. If splattered prime is unable to be removed from curb and gutter, it will be just cause for replacing the curb and gutter at the expense of the Contractor. Method of application for prime shall conform to the requirements as set forth in Section 401 of the Alabama Highway Department Standard Specifications for Highway Construction, 2012 Edition.

C. Resurfacing Existing Paved and Patched Surfaces:
   1. Loose material, dust, dirt, caked clay, and any foreign material that might prevent proper bond with the existing surface shall be removed to the shoulders or curb for the full width of the treatment by means of blading, revolving brooms, mechanical sweepers, and blowers. Surface dust and other loose materials not removed by mechanical means shall be removed with hand brooms. Particular care shall be taken to clean the outer edges of the strip to be treated in order to insure that the bituminous treatment will adhere. Sweeping and blowing shall be continued until all the loose dirt is removed and the surfaces of the larger size aggregate in the road surface are exposed but not dislodged. All sweeping shall be removed before any bituminous material is applied. Heavy concentration of broomed or loose stone, on or adjacent to resurfacing areas shall be removed and disposed of by the Contractor at a site obtained by the Contractor. No tack coat shall be applied until the preparation of the old surface has been approved by the Engineer. Before applying tack all vegetation shall have been removed and surface treated with an approved soil sterilant to prevent the emergence of vegetation.
   2. Tack Coat: The tack coat shall consist of a single application of bituminous material on a prepared existing asphalt surface. No tack coat shall be applied until the preparation of the old surface has been approved by the Engineer. Before applying tack the surface shall be swept clean and all vegetation and foreign matter removed. Method of material

application for tack shall conform to the requirements as set forth in Sections 401 and 405 of the Alabama State Highway Department Standard Specifications, 2012 Edition.

3. Bituminous Plant Mix Leveling Course: This item shall consist of a Bituminous Plant mix leveling course applied in accordance with Sections 410 and 424 of the Alabama State Highway Department Standard Specifications, 2012 Edition. The mix shall be designed on the fine side of the restricted zone.

D. Bituminous Plant Mix Wearing Surface: This item shall consist of a Bituminous Plant Mix wearing surface applied in accordance with Sections 410 and 424 of the Alabama Highway Department Standard Specifications, 2012 Edition. The mix shall be designed on fine side of the restricted zone. The finished plant mix wearing course shall be placed at a rate of 125 lbs. per square yard, unless shown otherwise on the plans.

E. Manhole and Valve Adjustments:
1. Manholes shall be adjusted to finished paving surface prior to the placement of any asphalt resurfacing. The manholes shall be adjusted by resetting manhole frames. Manhole frames shall be dug up and re-set to the proper grade to match the new resurfacing. The frames shall be properly grouted in place and all patching around the manhole shall be completed with concrete left below finish grade appropriate thickness of bituminous resurfacing course.
2. Valves boxes shall also be adjusted to the finished paving surface prior to the placement of any asphalt resurfacing. The Contractor shall notify the water and gas companies that serve the area and have them locate all known valves to be affected by this project.

3.4 REMOVING PAVEMENT, REPLACING BASE AND PAVING (ENTIRE WIDTH)

A. Where sewerage lines and appurtenances are constructed in existing paved streets, the pavements shall be removed and replaced with base in accordance with the following procedures:
1. The existing street pavement or surface shall be removed along the line of the work for the width required for the trench or structure.
2. Immediately following sewer installation, trench backfill shall be compacted for the full depth of the trench as specified in the section of these Specifications entitled “EARTHWORK”.
3. Trench backfill along paved streets and driveways shall include 6 inches of No. 57 Crusher Run Stone or Sand-Clay Base as a temporary surfacing of the trenches. This temporary surface shall be installed level with the existing asphalt surface and shall be maintained dust-free by the Contractor until compaction tests are performed and the replacement pavement is placed.
4. Within 30 days after backfill is placed the asphalt surface shall be replaced.

B. Full-width bituminous paving shall be applied to all areas where pavement was removed. Full-width bituminous paving shall consist of the following items:
1. Pulverized In-situ Material Base Course: This item shall consist of mixing by pulverizing the existing surface and base material for the entire street width to provide a foundation for a surface course of pavement.
a. The pulverized base course shall be in accordance with these specifications and in conformity with the lines, grades, thicknesses, and typical cross-sections shown on the plans or as designated by the Engineer. The work covered shall consist of furnishing all labor, equipment, and operation required to mix, shape water and compact the in-situ materials base course in accordance with the plans and

specifications thereof. The base course shall be processed by thoroughly pulverizing, blending, and mixing until uniform in texture and appearance, the existing surface and base material. The material shall then be shaped, watered and compacted. Density requirements for compaction shall be 98% of the maximum density at optimum moisture content as measured by AASHTO T-180, Method A (modified proctor) for sand clay, and for crushed stone shall be 83% of the volume density as determined from the bulk specific gravity by AASHTO T-84 and T-85 and the dry weight of aggregate. Testing requirements shall be as follows: One (1) Proctor Density test and one (1) Field Density test at approximately 500 foot intervals at points selected by the Engineer plus one (1) Field Density test at each manhole. The section and density shall be maintained until placement of the surface course.

2. Prime Coat: The bituminous treatment shall consist of a prime coat composed of a single application of bituminous material on a prepared base course. No prime coat shall be applied until base course has been approved by the Engineer. Before applying prime, the surface shall be swept clean and sprinkled with water if directed by the Engineer. Care shall be taken to keep prime off curb and gutter. If splattered prime is unable to be removed from curb and gutter, it will be just cause for replacing the curb and gutter at the expense of the Contractor. Method of material application for prime shall conform to the requirements as set forth in Section 401 and 405 of the Alabama State Highway Department Standard Specifications, 2012 Edition.
3. Bituminous Plant Mix Wearing Surface: This item shall consist of a Bituminous Plant Mix wearing surface applied in accordance with Sections 410 and 424 of the Alabama Highway Department Standard Specifications, 2012 Edition. The finished plant mix wearing course shall be placed at a rate of 165 lbs. per square yard, unless shown otherwise on the plans.
4. Manhole and Valve Adjustments:
   a. Manholes shall be adjusted to finished paving surface prior to the placement of any asphalt resurfacing. The manholes shall be adjusted by resetting manhole frames. Manhole frames shall be dug up and re-set to the proper grade to match the new resurfacing. The frames shall be properly grouted in place and all patching around the manhole shall be completed with concrete and left 1½ inches below finish grade for bituminous resurfacing course.
   b. Valve boxes shall also be adjusted to the finished paving surface prior to the placement of any asphalt resurfacing. The Contractor shall notify the water and gas companies that serve the area and have them locate all known valves to be affected by this project.

3.5 REMOVAL AND REPLACEMENT OF GRAVEL PAVING

A. Where sewerage lines and appurtenances are constructed in existing gravel drives, the gravel shall be removed and replace in accordance with the following procedure:
   1. The existing gravel will be removed along the line of the work for the width required for the trench or structure.
   2. Immediately following sewer installation, trench backfill shall be compacted for the full depth of the trench as specified in the section of these specifications titled “EARTHWORK”.
   3. Trench backfill shall include 6 inches of No. 57 Crusher Run Stone installed level with the undisturbed surface.
   4. The gravel surface shall be replaced within 5 days after backfill is placed.

5. The compaction tests shall be performed. One (1) density test shall be performed at each driveway. Minimum requirement for compaction shall 83% of the solid volume density determined from the bulk specific gravity by AASHTO T-84 and T-85 and the dry weight of the aggregate.

3.6 SIDEWALK AND DRIVEWAY REPLACEMENT

A. Construction:
   1. All concrete sidewalks and driveways shall be built and/or replaced with concrete material as specified herein.
   2. Asphalt sidewalks and driveways shall be replaced with asphalt material as specified herein.
   3. Shell or gravel driveways shall be replaced with a minimum of 8" of #57 crushed stone which shall be shaped and compacted to the template of the remaining driveway.
   4. Preformed joints for use in concrete sidewalks and driveways shall be ½-inch thick conforming to the latest edition of AASHTO Standard Specifications, M59, for preformed bituminous fiber joints.
   5. Concrete forms shall be of wood or metal, shall be straight and free from warp, and shall be of sufficient strength when in place to hold the concrete true to line and grade within springing or distortion.

B. When a section of sidewalk and driveway is removed, the existing sidewalk or driveway shall be cut to a neat line perpendicular to both the centerline and the surface of the slab. Concrete shall be cut along the nearest existing contraction joints unless such joints do not exist in which case the cut shall be made at minimum distances shown on the Drawings.

C. Existing sidewalks or driveways that have been cut and removed for construction purposes shall be replaced with sidewalks or driveways of the same width and surface as the portion removed. Concrete sidewalks shall have a minimum uniform thickness of 4 inches. Asphalt sidewalks or driveways shall have a minimum placement of 150 pounds per square yard. The new work shall be neatly jointed to the old so that the surface of the new work shall form an even unbroken plane with the old sidewalk.

D. Subgrade:
   1. The subgrade for concrete sidewalks or driveways shall be formed by excavating to a depth equal to the thickness of the concrete plus 2 inches. Subgrade shall be of such width as to permit the proper installation and bracing of the forms. Subgrades shall be compacted by hand tamping or rolling. Soft, yielding, or unstable material shall be removed and backfilled with satisfactory material. Two (2) inches of porous crushed stone shall be placed under all sidewalks and shall be compacted thoroughly, and finished to a smooth unyielding surface at proper line, grade, and cross section.
   2. The subgrade for asphalt sidewalks or driveways shall be formed by excavating to a depth equal to the thickness of the asphalt plus 6 inches and to a width of the asphalt plus 12 inches.

E. Base for asphalt sidewalks or driveways shall be 6 inches thick sand/clay and shall be 12 inches wider than the asphalt surface. Base shall be compacted to a minimum of 95% of the maximum laboratory density at optimum water content as determined by AASHTO T-99, Method A (Standard Proctor).

F. A prime coat shall be sprayed uniformly over the compacted base at a rate of 0.15 gallons per square yard.

G. A minimum of 150 pounds per square yard of asphalt shall be placed and compacted the entire width of the sidewalk or driveway. Asphalt shall be compacted to 95% of the maximum laboratory density. A core shall be cut every 100 linear feet at locations selected by the Engineer and used to determine the average thickness of the asphalt. The thickness of no core shall be less than ¼-inch less than the average thickness of all cores.

H. Expansion joints shall be required to replace any existing expansion joints that are removed with the sidewalk or driveway or in new construction every 30 feet. Expansion joints shall be true and even, shall present a satisfactory appearance, and shall extend to within ½-inch of the top of finished concrete surface.

I. Concrete shall be suitably protected from freezing and excessive heat. It shall be kept covered with burlap or other suitable material and kept wet until cured.

3.7 TRAFFIC LINE STRIPE, TRAFFIC CONTROL MARKINGS, AND PAVEMENT MARKERS

A. This item shall consist of preparing finished pavement for and applying reflectorized traffic paint (Class I, Type A) in accordance with the plans and these specifications. Construction methods and materials shall conform with Class I, Type A Sections 701 and 703 of the Alabama State Highway Department Standard Specifications, 2012 Edition. The Contractor may close sections of the street to traffic while applying and allowing paint to dry with written permission of the Engineer, and coordination with the Owner. Reflective markers shall comply with Section 705.

B. Traffic materials shall be applied only to surfaces that have sufficiently cured to permit good adhesion of materials. Paving shall be cured a minimum of 14 days prior to striping or placement of markers.

NOTE: Unless indicated otherwise on the drawings, new Traffic Line Stripe, Traffic Control Markings and Pavement Markers shall be same as existing (Prior to construction).

3.8 MAINTENANCE

A. The Contractor shall maintain the surfaces of roadways built and pavements replaced until the acceptance of the project. Maintenance shall include such dragging, reshaping, wetting, and rerolling as are necessary to prevent raveling of the road material, the preservation of reasonably smooth surfaces and repair of damaged or unsatisfactory surfaces to the satisfaction of the Engineer. Maintenance shall also include sprinkling as may be necessary to abate dust.

END OF SECTION 32 20 10

SECTION 32 20 11 - STREET IMPROVEMENTS

PART 1 - GENERAL

1.1 DESCRIPTION

A. The work under this section shall consist of performing all work required for constructing street improvements on the Treatment Plant site indicated on the plans including layout and staking, ground preparation, paving, curbs, sidewalks and drives, storm drainage and grassing.

1.2 RELATED WORK

A. Section 00 73 93 - Special Provisions.

1.3 QUALITY ASSURANCE

A. General: The general quality of materials and work in this section shall conform with indicated sections of the "Alabama Highway Department Standard Specifications for Highway Construction 2012 Edition" hereinafter referred to as Highway Specifications.

B. Testing and Certificates: Furnish the Engineer with test reports certifying composition, compaction and strength of materials and workmanship included in the job. These laboratory tests and all tests as provided for elsewhere in these specifications shall be furnished by the Contractor at the Contractor's expense. A minimum of four (4) copies of each report shall be furnished unless additional copies are specified elsewhere in the specifications.

C. Tests and reports shall be made in sufficient number to insure that all material and processes meet the specifications. Field tests shall be performed at locations designated by the Engineer. Frequency and types of tests shall be made as directed by the Engineer, but in no case less than the below listed requirements:
   1. Certifications for materials:
      a. Pipe - One per batch of pipe.
      b. Precast Manholes - One test per batch.
   2. Fertilizer - One test analysis per load or certification on each bag (single copies only required from bags).
   3. Seed - One test analysis for germination and weed content for each bag of seed (single copies only required from bags).

D. Design Mix: Submit design mix for each type of concrete and asphalt mixes used on the job for approval prior to mixing.

E. Field Material Testing:
   1. Finish subgrade for Paved Areas:
      a. One P.D. Lab Test per 3,000 sq. yd. or change of material.
      b. One Field Density (100% STD) per 1,500 sq. yd. at Pt. selected by Engineer.

c. One Field Density (95% STD) per 200 feet of trench or fraction thereof at 2-foot lifts at storm drainage locations.

2. Base of Paved Areas:
   a. One Gradation Test of base course material per pit or change in pit composition showing that such base course meets the applicable specifications.
   b. One Mechanical Analysis, Atterburg Limits, & Silt & Clay Analysis per 3,000 sq. yd. or change of material.
   c. One P.D. Lab Test, Modified per 3,000 sq. yd. or change of material.
   d. One Field Density (95% MOD) per 1,500 sq. yd. at Pt. selected by Engineer.

F. Embankments not Under Water: One P.D. Lab Test and one Field Density per 24 inches of fill as selected by the Engineer.

G. Concrete: Concrete cylinders shall be prepared and tested for each 50 C.Y. but not less than each day's operations for each type of concrete.

H. Submit mix to Engineer for approval prior to any mixing: One complete plant mix extraction analysis per 500 tons, but not less than one per day of operation.

I. Additional Tests: The time and place of all tests are to be determined by the Engineer. If field conditions warrant, additional tests may be required by the Engineer at the Contractor's expense.

J. Tolerances: Cross sections and shapes of work shall be as indicated in the plans and specifications. Permissible deviations from these sections shall be limited to those indicated in the plans, specifications and standards set forth in the Highway Specifications and ACI Standards.

1.4 ASPHALT AND CONCRETE PLANT QUALIFICATIONS

A. All asphalt and concrete plants supplying materials shall meet the requirements of local, state, and national codes and be approved by the highway department.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. General Product Delivery Storage and Handling shall conform with applicable sections of the Highway Specifications.

B. All materials stored at the job site shall be placed on the Owner's property in a manner that will not inconvenience adjacent property owners.

C. Fertilizer and grass seed shall be stored in a dry location above the ground and separated from damp areas by a moisture barrier.

D. Sod shall not be stored. If unusual conditions require sod to be temporarily stored, it shall be spread in a single layer and an adequate water supply shall be maintained.

1.6 JOB CONDITIONS

A. General: The Contractor shall become familiar with sections of Section 00 73 93 "Special Provisions" especially concerning stake-out, underground utilities, and subsurface conditions.

B. Every pipe or conduit for water, sewage, gas drainage or other use, and every foundation or other underground structure which may be encountered in trenching, shall be carefully protected from injury or displacement and all damage caused to such structures shall be completely repaired immediately by and at the expense of the Contractor, to the satisfaction of the Engineer.

C. Should other trades be constructed facilities in the limits of this work, the Contractor shall cooperate and coordinate work schedules to prevent damage and have all work properly completed in the time allowed.

PART 2 - PRODUCTS

2.1 PAVEMENT STRUCTURE MATERIALS

A. Borrow Material: Borrow material shall be a suitable sandy material that will compact into an embankment capable of withstanding minimum loads of 2,000 lbs. per sq. ft. and be free of muck, stumps, roots, rubbish or other debris.

B. Granular Sand Clay Base Course: The material shall be a natural granular sand clay meeting the requirements of Section 821 of the Highway Specifications with the following changes to specific requirements as follows:
1. Clay - 10% - 17%.
2. Liquid Limit - (LL) - 25.
3. Plasticity Index - 5.

C. Prime Asphalt for Prime Coat shall meet the requirements of Section 401.02 of the Highway Specifications.

D. Tack Coat: Asphalt for tack coat shall meet the requirements of Section 405.02 of the Highway Specifications.

E. Materials for Single Surface Treatment shall be in accordance with Section 401 of the Highway Specifications, Type J.

F. Asphalt Plant Mix: Hot asphalt plant mix material shall be prepared in accordance with Section 410 of the Highway Specifications including references to material quality. Leveling and resurfacing courses shall also comply with Section 424 of the Highway Specifications. Surface courses shall conform also to Section 424 as indicated on the plans or the proposal.

2.2 CONCRETE

A. Portland cement concrete materials, proportioning and mixing shall be in accordance with Section 501 of the Highway Specifications including references to material quality.

2.3 STORM SEWER MATERIALS

A. Concrete Pipe: Reinforced concrete pipe shall conform to the latest requirements of ASTM C-76 for reinforced concrete pipe and ASTM C-507 for elliptical pipe. All pipe shall be Class III, Wall "B". Mortar for jointing pipe shall be composed of one part-Portland Cement and two parts of sand. All culvert pipe may be either joined with mortar or have 0-ring rubber gaskets.

B. Corrugated Metal Pipe: Corrugated metal pipe shall be used only when specifically indicated in the plans or proposal. Pipe shall conform to the latest requirements of AASHTO M-36, Type A. Metal gauges shall be as indicated on the plans or proposal. Where gauges are not shown, they shall be in accordance with the Highway Specifications.

1. All pipe shall be full bituminous coated in accordance with AASHTO M-190. Connecting bands shall conform with AASHTO M-218. Bands shall have a minimum of two (2) circumferential corrugations and effectively engage the second valley from each end of pipe. Banks shall be a minimum of no more than three (3) thicknesses lighter than the pipe thickness, but no less than 17 gauge. Hardware for connecting bands shall be galvanized, and bands shall be full bituminous coated.

C. Pipe Underdrain: Pipe underdrain shall be perforated concrete, corrugated steel or poly-vinyl chloride in accordance with Section 853 of the Highway Specifications. Aggregate shall be in accordance with Section 853 of the Highway Specifications.

D. Manhole and Inlet appurtenances, manhole frames, gratings, covers, and steps shall be cast iron conforming in size, shape, and openings shown in the plans. The castings shall be in accordance with ASTM C20 grey iron castings.

E. Brick shall be hard burned common brick meeting ASTM Spec. C032 latest edition, Grade NA.

F. Riprap materials shall be in accordance with Section 814 of the Highway Specifications. Class 2 unless otherwise specified.

2.4 GRASSING MATERIALS

A. Topsoil: Topsoil shall be a mixture of soil suitable for plant growth and free from hard clods, brush, wood or other debris.

B. Seed: Seed shall be labeled in accordance with U.S. Department of Agriculture Rules and Regulations under the Federal Seed Act in effect on the date of Invitation for Bids. Seed shall be furnished in sealed standard containers unless exception is granted in writing by the Engineer. Seed which has become wet, moldy, or otherwise damaged in transit or in storage will not be acceptable. The minimum percentage by weight of pure live seed in each lot of seed shall be as follows:

KIND OF SEED	**MINIMUM PERCENTAGE OF PURE LIVE SEED**	**MAXIMUM PERCENTAGE OF WEED SEED**
Bermuda (hulled)	82	0.50
Perennial Rye Grass	85	0.50

C. Sod: Sod materials, quality and handling shall be in accordance with Section 860.05 of the Highway Specifications.

D. Fertilizer: Fertilizer shall be 8-8-8 commercial mixed grade, uniform in composition, free-flowing and suitable for application, with approved equipment, delivered to the site in bags or other convenient containers, each fully labeled, conforming to the applicable State Fertilizer Laws, and bearing the name, trade name or trademark, and warranty of the producer.

E. Lime: Lime shall be an agricultural grade of limestone ground to such an area of fineness that 90% of material will pass through a 10 mesh screen and not less than 50% will pass through a 60 mesh screen.

F. Mulch: Mulch shall be Class A Mulch in accordance with Section 860.03 of the Highway Specifications.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clearing and Grubbing: This item shall consist of clearing and grubbing the area within the limits of the right of way of the streets to be graded and paved and areas where drainage pipes and ditches are to be installed.
   1. Clearing shall consist of removing all trees, stumps, logs, brush, fences, steps, concrete slabs, and other obstacles encountered above ground level.
   2. Grubbing shall consist of removing all stumps, grass, existing drainage structures, pipe, existing paving and other obstacles encountered where they are within the limits of the rights of way below ground level.

B. Unclassified Excavation: This item shall consist of performing all operations in connection with the removal and satisfactory use of all materials of whatever nature taken from the limits of the work and all other operations required in compacting, shaping, and sloping the road ways and approaches according to the plans or as directed by the Engineer.
   1. All suitable materials removed from the excavation shall be used as far as practicable in the formation of embankments, subgrade, shoulders, slopes, and for such other purposes and at such other places as directed, at locations shown on plans or disposed of to the satisfaction of the Engineer. All surplus material shall be disposed of by the Contractor at his own expense at places selected by the Contractor or as directed by the Engineer.
   2. The entire subgrade, both in cut and in fill shall be plowed or scarified, and harrowed for a depth of 6 inches unless otherwise directed by the Engineer. In embankment construction, the materials shall be deposited and spread in successive, uniform layers of not more than 8 inches in loose measurement and each layer of embankment shall be rolled and compacted to 95% of the relative maximum density as determined by the AASHTO compaction Test T-99 except that the last 6 inches of the subgrade shall be compacted 100% of the relative maximum density.
   3. All slopes shall be flattened, rounded, finished or trimmed in a neat workmanlike manner to closely conform to the slope lines shown on the Plans or as modified by the Engineer to conform to the surrounding terrain.

4. The Contractor shall furnish a satisfactory template conforming to the typical cross section of the finish base which shall be used as directed by the Engineer to assure proper finish base grades.
5. No classification of materials will be made for purpose of payment and excavation under this section shall include all excavation performed regardless of the material encountered.

C. Unsuitable Material Excavation: This item shall consist of performing all operations in connection with the removal and disposal of all unsuitable subgrade materials of whatever nature, in the areas, and to the limits shown in the plans or as directed by the Engineer.

3.2 PAVEMENT STRUCTURE

A. Granular Sand Clay Base Course: This item shall consist of a foundation course for a surface course or pavement. The base course shall be constructed on the prepared subgrade in accordance with these specifications and in conformity with lines, grades, thicknesses, number of component courses, and typical cross-sections shown on the plans or as designated by the Engineer. The work covered shall consist of furnishing all labor, equipment, and operations required to mix, shape, water and compact the sand-clay base course in accordance with the plans and specifications therefore.
1. The source of the materials shall be the responsibility of the Contractor. The Contractor shall obtain the material, subject to approval of the Engineer, from sources of his own selection. The Contractor shall make all necessary arrangements with the Owner of the pit and bear all the expense of procuring and delivering the materials including the cost of opening, developing, clearing, stripping of over burden, pit moves, hauling and spreading of the materials and other incidentals necessary to complete the work as required by the specifications.
2. No base material shall be placed on the roadway until the sub-grade has been approved by the Engineer.
3. Construction of the base course shall be to the thickness shown in the plans and shall conform to the construction methods set forth in Section 301 of the Highway Specifications.
4. Density requirements for compaction shall be in accordance with Section 306 of the Alabama Highway Specifications (95% T-180, $\pm$ 2% moisture).

B. Prime Coat: The bituminous Treatment shall consist of a prime coat composed of a single application of bituminous material on a prepared base course.
1. No prime coat shall be applied until base course has been approved by the Engineer. Before applying prime, the surface shall be swept clean and sprinkled with water if directed by the Engineer. Care shall be taken to keep prime off curb and gutter. If splattered prime is unable to be removed from curb and gutter, it will be just cause for replacing the curb and gutter at the expense of the Contractor.
2. Method of and material application for prime shall conform to the requirements as set forth in Section 401 of the Highway Specifications.

C. Tack Coat: The tack coat shall consist of a single application of bituminous material on a prepared existing asphalt surface. No tack coat shall be applied until the preparation of the old surface has been approved by the Engineer. Before applying tack the surface shall be swept clean and all vegetation and foreign matter removed.
1. Method of material application for tack shall conform to the requirements as set forth in Sections 401 and 405 of the Highway Specifications.

D. Single Bituminous Surface Treatment, Type J: Single Bituminous Surface Treatment Type J shall consist of a wearing surface composed of an application of bituminous material covered with aggregate.
   1. General requirements for the single bituminous surface treatment shall conform to Section 401 of Highway Specifications.
   2. The sequence of operations is the hot application of bituminous material followed immediately by the covering of aggregate. The amounts of bituminous material and aggregate together with size and amount of aggregate per square yard of Treatment area shall conform to the Bituminous Treatment Table for Type J under Section 401.10B of Highway Specifications.
   3. The aggregate shall be crushed stone or crushed slag.

E. Bituminous Plant Mix Leveling Course: This item shall consist of a Bituminous Plant Mix Leveling Course mixed in a stationary plant conforming to Section 410 of the Highway Specifications.
   1. The general composition of the plant mix shall conform to Section 424, Bituminous Material shall be asphalt cement Grade AC 20 or AC 40.
   2. Construction methods shall conform to Section 410 of the Highway Department Specifications.

F. Bituminous Plant Mix Wearing Surface: This item shall consist of a Bituminous Plant Mix wearing surface mixed in a stationary plant conforming to Section 410 of the Highway Specifications unless otherwise indicated in the plans. The finished plant mix wearing course shall be placed at a rate of 150 lbs. per square yard.
   1. The general composition of the Plant Mix shall conform to Section 424. Bituminous material shall be asphalt cement Grade AC-20 or AC-40.
   2. Construction methods shall conform to Section 410 of the Highway Specifications.

3.3 CONCRETE CURB, DRIVEWAYS, AND SIDEWALKS

A. Concrete Curb and Gutter: This item shall consist of constructing Portland Cement Concrete curb without reinforcement in accordance with specifications at the locations shown on the plans or established and in conformity with the lines, grades, dimensions and cross sections shown on the plans.
   1. All concrete for curb and gutter shall be proportioned, mixed and transported in accordance with the requirements for structural Portland Cement Concrete as set forth in Section 501 of the Highway Specifications. Poured concrete shall be Class A, Type 2, and machine curb mix shall be Class C, Type 4, 3,000 psi.
   2. Forms are to be of steel, free from warp and shall meet the approval of the Engineer. The depth of the forms shall equal the depth of the curb and gutter. Forms shall be securely staked, braced, and held together to the exact lines and grades established. All forms shall be cleaned and oiled immediately before concrete is placed against them. Expansion joints shall be 40 feet on centers and at all P.C. and P.T. of radii. Suitable metal templates shall be placed to divide concrete into sections no longer than 10 feet.
   3. Concrete may be laid with an automatic extrusion type curb and gutter machine meeting the requirements of paragraph 623.03(d)(3) of the Highway Specifications.
   4. Placing and finishing of the concrete shall conform to the requirements of Section 623.03(h), and (i) of the Highway Specifications, and may be machine finished at option of the Contractor.

5. Curing and finishing of the concrete shall conform to the requirements of Section 623.03(h), and (i) of the Highway Specifications, and may be machine finished at option of the Contractor.
6. After the concrete has set sufficiently, spaces along the front and back sides of the curb and gutter shall be backfilled to the required elevations with suitable material which shall be thoroughly compacted.
7. The typical drive turn out shall be required at all driveways. The typical drive turn out shall also be placed at any other point designated by the Engineer.

B. Concrete Curb: This item shall consist of constructing Portland Cement concrete curb without reinforcement in accordance with specifications at the locations shown on the plans or established and in conformity with the lines, grades, dimensions and cross sections shown on the plans.
1. Construction methods, materials, finishing, curing, backfilling and measurement and payment shall be in accordance with Section 3.3 of these specifications.

C. Driveway Turnouts: This item shall consist of constructing new concrete driveway turnouts at the locations shown in the plans or as directed by the Engineer, and in accordance with the details shown.
1. All concrete shall be poured of Class "A", Type 2 mix concrete. The base material on which the concrete is placed shall be prepared so that the base is firm and free from spongy materials. Form work shall be true and new concrete surfaces shall conform to the line and grade shown in the plans or as directed by the Engineer.
2. Construction requirements shall conform with Section 618.03 of the Highway Specifications.
3. Accepted concrete driveway turnouts will be measured in lineal feet complete in place to the nearest one-tenth (1/10) foot along the property line end of the turnout.

D. Concrete Sidewalk: This item shall consist of constructing a new concrete sidewalk at the locations shown in the plans or as directed by the Engineer.
1. All concrete sidewalks shall be constructed of Class "A", Type 2, 3,000 lb. concrete, mixed, transported, placed and cured in accordance with Section 501 of the Highway Specifications. The base material on which the concrete is placed shall be prepared so that the base is firm and free from spongy materials. Form work shall be true and new concrete surfaces shall conform to the line and grade shown in the plans or as directed by the Engineer.

E. Replacement of Concrete Driveways and Sidewalks: This item shall consist of replacing concrete sidewalks and driveways that are removed at the direction of the Engineer and required to be replaced.
1. All concrete sidewalk and concrete driveways shall be constructed of Class "A", Type 2, 3,000 psi concrete, mixed, transported, placed and cured in accordance with Section 501 of the Highway Specifications. Old concrete shall be cut to a neat line. The base material on which the concrete is placed shall be prepared so that the base is firm and free from any spongy materials. Form work shall be true and new concrete surfaces shall conform as nearly as possible to the old materials replaced. All flat concrete shall be the same thickness as the old concrete replaced, but in no case less than 4 inches thick.
2. Broken concrete shall be retained in stock, by the Contractor and used as rip-rap at end of pipe, along ditches or where directed by the Engineer. Cost of storing and placing this rip-rap at designated locations will not be paid for separately, but will be considered incidental to the work involved.

3.4 STORM SEWERS

A. Concrete Pipe: This item shall consist of furnishing and installing reinforced concrete pipe of the classes and sizes shown in the Proposal and plans in accordance with the requirements of these specifications in conformity with the established lines and grades as shown on the plans or as directed by the Engineer.

1. All pipes or other underground utilities shall be maintained in continuous service and shall be properly protected and supported. In no case shall interruptions to a utility service be allowed to exist outside of working hours.
2. Prior to starting the work, the proper authorities of all utilities shall be notified by the Contractor and the Contractor shall cooperate in every way possible with these authorities. Whenever necessary to determine the location of existing pipes, valves or other underground structures, the Contractor shall examine all available records and shall make all exploration and excavation for such purpose.
3. In the event that any pipe or facilities are broken by the Contractor operations as a result of being exposed, unsupported, or negligence, the Contractor shall be held responsible for their complete and prompt restoration in a workmanlike manner at the Contractor's expense.
4. The Contractor shall perform all excavation of every description and of whatever substances encountered, to the depths indicated on the drawings. All excavated materials not required for fill or backfill shall be removed and wasted as indicated on the drawings or as directed by the Engineer. All excavation shall be made by open cut.
5. The banks of trenches shall be kept as nearly vertical as practicable and where required, shall be properly sheeted and braced. Trenches shall be not less than 12 inches wider nor more than 16 inches wider than the outside diameter of the pipe to be laid therein, and shall be excavated true to line, so that a clear space not less than 6 inches nor more than 8 inches in width is provided on each side of the pipe.
6. For sewers, the maximum width of trench specified applies to the width of the trench at and below the level of the top of the pipe; the width of the trench above the level of the top of the pipe may be made as wide as necessary for sheeting and bracing, and the proper installation of the work. The bottom trenches shall be accurately graded to provide uniform bearing and support for each section of the pipe on undisturbed soil at every point along its entire length, except for portions of the pipe sections where it is necessary to excavate for bell holes and for the proper sealing of pipe joints.
7. Costs for dewatering of pipe ditches and inlet excavations shall be included in the cost for construction of these items and will not be paid for separately.
8. Bell holes for the sewer pipe shall be excavated only to an extent sufficient to permit accurate work in the making of the joints and to insure that the pipe, for a maximum of length, will rest upon the prepared bottom of the trench. The lower 4 inches of the pipe trenches measuring from an overhead line set parallel to the grade line of the sewer shall be excavated only a few feet in advance of the pipe laying, by men especially skilled in this type of work. Sewer trench cut below grade shall be backfilled with select foundation material at the Contractor's expense.
9. Whenever wet or otherwise unstable soil is encountered in the trench bottom, such soil shall be removed to a depth required and for the lengths designated by the Engineer, and the trench backfilled to trench bottom grade hereinafter specified, with select foundation material. The select foundation material shall be deposited in 6 inch layers and thoroughly tamped. No payment will be made for the excavation below grade or for foundation material.
10. All pipe shall be carefully inspected before lowering into the trench, to insure that each joint is clean, free of defects and sound. The pipe shall have a firm and even bearing

throughout the length of the barrel. Pipe shall be brought to proper grade by scraping materials from underneath same, or by filling same uniformly with good earth. No wooden blocks or other substances shall be used under the pipe to raise it to grade. As the work progresses the interior of the sewer shall be cleared of all dirt and superfluous materials of every description. All joints of the concrete pipe shall be completely wiped with stiff cement mortar. Pipe shall be laid true to line and grade and in such a manner as to form a close concrete joint with the adjoining pipe. There shall be no off sets of the flow line. No pipe or fitting shall be finally set until the inverts coincide. Each joint shall be securely bedded before the next joint is laid. Whenever pipe laying is stopped for the night or for other cause, the end of the pipe shall be securely closed with a stopper to prevent entrance of water, mud, animals or other obstructing matter.

11. Backfill over pipe and adjacent to structures shall be compacted to a minimum density of 95% as determined by AASHTO compaction test T-180. Backfill shall be placed in uniform layers and compacted by tamping and rolling until the backfill is completed. Care shall be taken not to damage or disturb the sewer pipes or structures during the backfill process.
12. The sewer pipe will be connected to the existing sewers and existing catch basins in a water tight joint. There will be no bid item for connecting to existing sewers and existing catch basins. No extra payment will be made for such. The Contractor shall restore all existing pavement, structures, inlets, roadways, or other incidental items that are damaged by the installation of sewers, structures, or connecting to existing sewers at the expense of the Contractor.
13. Where designated by the Engineer; pipe, structures, other items shall be encased with Class B, 2,000 lb. concrete. Such encasement shall be placed in accordance with the instructions and in the amounts directed by the Engineer.

B. Corrugated Metal Pipe: This item shall consist of furnishing and installing corrugated steel storm pipe of the sizes shown on the proposal and plans in accordance with the requirements of these specifications and in conformity with the established lines and grades as shown on the plans or directed by the Engineer.
   1. Corrugated metal pipe shall conform to the latest requirements of AASHTO M 190, Type A for bituminous coated pipe.
   2. Metal gauges shall be shown in the plans or proposal. Where not shown, the gauge shall be as directed by highway Specifications.
   3. Joints where necessary shall be made with standard connecting bands. Bands shall be installed in accordance with standard practices and uniformly tightened. Contractor shall keep foreign matter from between the connecting bands and the pipe. When bituminous coated pipe and bands are used, Contractor shall recover any exposed metal with a bituminous patch before placing the backfill.

C. Underdrain: This item shall include furnishing and installing of perforated drain pipe in accordance with the specifications at the locations directed by the Engineer in conformity with the lines and grades given by the Engineer.
   1. This item shall also include the furnishing and construction of such joints in connections to other pipes, catch basins, endwalls, etc. as may be required to complete the work. No compensation will be allowed for these items, they being considered incidental to the laying of the perforated underdrain.
   2. The trench shall be excavated to the established lines and grades. The pipes shall be laid with bells upstream on 4 inches of course aggregate. The pipe shall then be backfilled with a minimum of 1 foot of approved coarse filler aggregate. A minimum of 24 inches of washed concrete sand shall be placed over the coarse aggregate. The backfill above the

filler aggregate shall be of an impervious material. Underdrain pipe shall be laid only where authorized by the Engineer.

D. Manholes, Inlets and Junction Boxes: This item shall consist of furnishing and constructing all the necessary manholes and inlets shown on the plans or as directed by the Engineer, complete with frames, grates, covers and steps.
   1. Manholes and Inlets shall be constructed of brick masonry, precast concrete, or cast in place concrete as shown in the plans or as directed by the Engineer. Bottoms for structure shall be constructed of reinforced concrete.
   2. Frames, gratings, covers and steps shall be of cast iron conforming in size, shape and openings as shown on the plans. The quality of iron shall conform to the current ASTM Specifications for Class 20 Gray Iron Castings.
   3. Every manhole and inlet is to be built as the work progresses and shall be carried up to proper grade. Manholes and inlets shall be neatly and accurately built according to the plans. The inverts shall be so formed as to facilitate the entrance and flow of water through them. Steps shall be placed as shown on the plans. The Contractor shall properly set in mortar to line and grade all cast iron frames and covers.
   4. Concrete for manholes and inlets shall be Class A, Type 2, 3,000 lb. concrete.

E. Headwalls: Headwalls shall be erected according to details of the various types shown on the plans. Materials and construction methods shall meet the requirements of Section 501 of the Highway Specifications. The type selected for each location shall be at the discretion of the Engineer.
   1. Concrete for headwalls shall be Class A, Type 2, 3,000 PSI.

F. Concrete Ditch Paving: Concrete ditch paving shall be constructed in conformance with lines, grades and sections shown on the plans and in accordance with Articles 614.01 to 614.03 of the Highway Specifications, that all ditch regarding shall be included in the payment for ditch paving.
   1. Concrete for ditch paving shall be Class A, Type 2b.

G. Riprap: Where called for on the plans, after pipes and embankments have been placed and compacted a sufficient amount of material shall be removed and replaced below storm water pipe discharges with riprap material to form a smooth graded invert. Riprap may be dumped and shaped by whatever method that will insure the minimum thickness is achieved and the finished grade line is maintained.

H. Encasement: Where designated by the Engineer, pipe, structures, and other items shall be encased with Class B, 2,500 lb. concrete. Such encasement shall be placed in accordance with the instructions and in amounts directed by the Engineer.

3.5 GRASSING

A. General: Grassing shall consist of preparing areas for grassing including furnishing, as required, placing and incorporating topsoil, lime, fertilizer, seeding, mulching as required, setting sod where specified, and watering to obtain a satisfactory growth and coverage of grass.
   1. Grassing of the areas indicated on the plans and directed by the Engineer shall commence after the construction areas have been backfilled.

B. Acceptance: The Contractor shall, at his expense, maintain the grassed areas in a satisfactory condition until final acceptance of the project. Such maintenance shall include the filling, leveling, and repairing of any washed or eroded areas, as may be necessary. The Engineer, at any time, may require replanting of any areas in which the establishment of the grass stand does not appear to be developing satisfactorily.

1. If a planted area must be replaced due to the Contractor's negligence, carelessness, or failure to provide routine maintenance of such area, such replacement shall be at the Contractor's expense.
2. The Contractor shall be responsible for obtaining a satisfactory stand of permanent grass as determined by the Engineer. When seeding a satisfactory stand is defined as having at least nine (9) growing seedlings approximately 1½ inches long for Bermuda grass in each square foot of the planted areas within 60 days following the planting operations. When sodding, a satisfactory stand is defined as having at least 90% of the seedlings which are viable and growing 30-60 days following the sodding operation.

C. Preparation: When topsoil is available from other operations, a sufficient amount shall be removed by excavation, stripping or other approved method. The depth to which it shall be excavated shall be determined by the Engineer. The top soil shall be without a mixture of subsoil. Tall vegetation, brush, wood or other debris shall be removed from the area to be stripped. Ordinary sods are not to be removed from the topsoil. It shall be kept separate from all other classes of excavated material and shall be stockpiled in approved locations on well drained land.

1. The ground shall then be cultivated to loose depths of 2 inches. The topsoil shall then be hauled and applied to the designated areas to a depth of 2 inches. It shall then be harrowed and disked entirely through the layer of topsoil and partially into the subsoil in order to secure a bond of the topsoil with the subsoil. Fertilizer and lime shall be incorporated at the rate of 1,500 pounds per acre each during the harrowing and disking of the topsoil. The Contractor shall maintain the topsoil that has been placed without extra compensation, in connection with any seeding, sodding, planting, or otherwise, until final completion of the project. Maintenance shall consist of preserving, protecting, replacing, and such other works as may be necessary to keep the work in a satisfactory condition.

D. Seeding Rate: The seeding of permanent grass shall consist of applying Bermuda seeds sown during the spring and summer between the dates 1 April and 30 September. The seeding of a fall cover shall consist of a mixture of perennial rye grass and Bermuda sown in the late fall and winter between the dates 1 October to 31 March. Seed shall be sown at the following rates between the dates 1 April and 30 September:

Kind of Seed	**Minimum Pounds Per Acre**
Bermuda	60

1. The seed shall be sown at the following rate between the dates 1 October and 31 March:

Kind of Seed	**Minimum Rate Per Acre**
Bermuda (unhulled)	60 Pounds
Perennial Rye Grass	2 Bushels

E. Sowing:
   1. General - A satisfactory method of sowing seed shall be employed, making use of approved mechanical power-driven drills or seeders, mechanical hand seeders, or other approved methods. When drills are used, provisions shall be made by markers or other means to assure that the successive seeded strips will overlap or be separated by a space no greater than the space left between the rows planted by the equipment being used. When delays in operations carry the work beyond the most favorable planting season for the drought, high winds, excessive moisture, or other factors, that satisfactory results are not likely to be obtained, the work will be stopped by the Engineer and shall be resumed only when directed. If inspection, during seeding operations or after there is a show of green, indicates that strips wider than the space between the rows planted have been left unplanted, or that other areas have been skipped, the Engineer may require the sowing of additional seed on these areas.

F. Broadcast Seeding: Seed shall be broadcast either by hand or approved sowing equipment at the rate of 60 pounds per acre. The seed shall be uniformly distributed over the designated areas. Half the seed shall be sown with the sower moving in one direction, and the remainder shall be sown with the sower moving at right angles to the first sowing. The seed shall be covered to an average depth of ¼-inch by means of a brush harrow, spike-tooth harrow, chain barrow, cultipacked or other approved device. Broadcast seeding shall not be done during windy weather.

G. Compacting: Immediately after seeding operations have been completed, the entire area shall be compacted by means of a cultipacker, roller, or other approved equipment weighing 60 to 90 pounds per linear foot of roller. If the soil is of such type that a smooth or corrugated roller cannot be operated satisfactorily, a pneumatic roller, not wobble-wheel, shall be used. The pneumatic roller shall have tires of sufficient size so that complete coverage of the soil surface is obtained. When a cultipacker or similar equipment is used, the final rolling shall be at right angles to the existing slopes to prevent water erosion or at right angles to prevailing wind to prevent wind erosion.

H. Mulching: When mulching is called for, approximately two inches, loose thickness, of the mulch material shall then be applied uniformly over the seeded area, and the mulch material cut into the soil with the equipment specified so as to produce a loose mulched thickness of 3 to 4 inches. Care shall be exercised that the materials are not cut too deeply into the soil. When green mulch is used green mulch shall be incorporated into the soil not later than two days after being cut, and no artificial watering of the mulch shall be done before it is applied.

I. Sodding: All areas indicate on the plans to be sodded shall be solid sodded with Bermuda sod in accordance with Section 654 of the Highway Specifications.

END OF SECTION 32 20 11

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SECTION 32 31 13 - CHAIN LINK FENCING

PART 1 - GENERAL

1.1 SCOPE

A. The work covered by this section includes furnishing all labor, materials, and equipment required to install chain link fence, including all excavation, concrete, and accessories, as shown on the Drawings or specified herein. The work shall also include connection to existing chain link fencing, including relocation and/or reinforcement of same.

B. Excavation and backfilling and concrete shall conform with the requirements of the sections entitled "Earthwork" and "Cast-in-Place Concrete," respectively.

1.2 SHOP DRAWINGS AND ENGINEERING DATA

A. Submit complete shop drawings and engineering data in accordance with the requirements of the section entitled "Submittals" of these Specifications.

1.3 GUARANTEE

A. Provide a guarantee against defective products and workmanship in accordance with the requirements of the section entitled "Guarantees and Warranties" of these Specifications.

PART 2 - PRODUCTS

2.1 CHAIN LINK FENCE

A. Chain link fence shall have an overall height of 84 inches and shall be constructed of chain link fabric 72 inches high with three rows of barbed wire on top of steel brackets.

B. Material for rails and posts shall be open hearth, Class II conforming to the requirements of ASTM A36. Alternately, posts may be roll formed sections of carbon steel having a minimum yield strength of 35,000 psi. Rails and posts shall be hot dipped galvanized in accordance with ASTM A 120 or A 123, as applicable.

C. End, corner, angle, and pull posts shall be 2⅞ inch outside diameter, standard tubular steel weighing not less than 5.79 pounds per linear foot, or 3.5-inch by 3.5-inch roll formed steel sections weighing not less than 4.84 pounds per linear foot.

D. Line posts shall be 2¼ inch structural "H" sections weighing 4.1 pounds per linear foot, 2.25-inch by 1.70-inch roll formed steel C-sections weighing not less than 2.64 pounds per linear foot, or 2⅜ inch outside diameter steel pipe weighing 3.65 pounds per linear foot.

E. Top rail shall be 1⅝ inch outside diameter steel pipe weighing 2.27 pounds per linear foot or "H" section weighing 2.27 pounds per linear foot. Top rails shall be provided with expansion rail couplings spaced at not less than 20-foot intervals.

F. Gate posts for pedestrian gates shall be 2⅞ inch outside diameter pipe weighing 5.79 pounds per linear foot. Gate posts for vehicular gates shall be 4 inch outside diameter pipe weighing 9.1 pounds per linear foot.

G. Braces shall be provided at all corners and wherever fabric is not continuous, such as at gates or at other openings. Braces shall be of the same material as top rail.

H. Extension arms on intermediate posts shall be of pressed steel. Extension arms on end and corner posts shall be heavy malleable iron. Extension arms shall carry three (3) barbed wires at an angle of 45° from the vertical towards the outside of the fence.

I. Fittings used in connection with the fence and gates shall be heavy malleable iron or pressed steel.

J. Barbed wire shall be 4-point pattern, two strand, No. 12-1/2 gauge, Class II, heavily hot dipped galvanized after weaving, with 14-gauge barbs placed 3 inches on center.

K. Chain link fence shall be No. 9 gauge wire, heavily hot dipped galvanized after weaving. Galvanized coating conforming to ASTM A 392 Class II, 1.8 ounce minimum. As an alternate, the chain link fabric shall be 9 gauge aluminum coated conforming to ASTM A 491, 0.40 ounce minimum. The fabric shall have a knuckled selvage along the top rail and a twisted and barbed selvage along the bottom. The barbing shall be done by cutting the wire on a bias, creating sharp points.

L. A 2 inch padlock and chain conforming to the latest Federal Specifications FF-P-101a, Type Id, shall be furnished with each gate. Three keys shall be furnished with each padlock. Chain shall be welded to the gate.

M. Gate frames shall be of 1.9 inch outside diameter pipe weighing 2.83 pounds per linear foot. Corner fittings shall be of heavy, malleable iron castings or pressed steel. Fabric shall be same as in fence. Each gate frame shall be equipped with ⅜ inch diameter adjustable truss rod. Gates shall be complete with ball-and-socket hinges, catch and stops. Double gates shall have center rests. Hinges shall provide for swinging the gate open through an arc of not less than 180°. Gates shall be suitably braced and reinforced to prevent sagging. Double gates shall be provided with center plunger rod, catch and semi-automatic outer catches to secure gate in opened position. Pedestrian gates shall have 4 foot openings. Vehicular gates shall be of double swing type with 20 foot opening, unless shown otherwise on the Drawings.

N. All tension bars shall be ¼-inch by ¾-inch ASTM A 36 mild carbon steel, and hot dipped galvanized. Tension bars shall extend the full height of the chain link fabric with no splices. Tension bars shall be held in place by ⅞-inch galvanized tension bands at a maximum spacing of 24 inches.

O. All ferrous materials entering into the construction of required fencing shall be heavily galvanized by the hot dip process.

2.2 PRIVACY SLATS

A. Privacy slats shall be manufacturer's standard aluminum slats. Color to be selected by Owner.

PART 3 - EXECUTION

3.1 INSTALLATION

A. End, corner, and gate posts shall be set in a concrete base not less than 12 inches in diameter which shall extend at least 3 inches below the bottom of the post. The post shall extend to a depth of at least 3 feet below the surface of the ground. A brace shall be spaced midway in height of each end, corner, and gate post and shall extend to the first line post. Braces shall be securely fastened to posts by means of malleable iron connections and trussed from line post back to end, corner, or gate post with a ⅜-inch diameter rod.

B. Line posts shall be set in a concrete base not less than 10 inches in diameter which shall extend at least 3 inches below the bottom of the post. The post shall extend to a depth of at least 30 inches below the surface of the ground. Line posts shall be equally spaced along the line of fence at not to exceed 10-foot intervals.

C. Galvanized steel pipe sleeves, 4-inch O.D. for corner, pull, and gate posts and 3½ inch O.D. for line posts shall be embedded in concrete as shown on the Drawings for all fence posts to be installed on concrete structures.

D. Top rail shall be installed between line posts. Fabric shall not be erected until concrete has had sufficient time to cure. Chain-link fabric shall be stretched to uniform tightness on the outside of the posts with suitable tools and shall be attached with No. 6 gauge galvanized wire clips. Fabric shall be fastened to line posts at 14 inch intervals with 9 gauge ties. Fabric shall be attached to top rail at 24 inch intervals by 9 gauge tie wires.

E. A No. 7 gauge galvanized wire shall be stretched along the bottom of the fence and securely fastened to the posts. The chain-link fabric shall be attached to the tension wire at intervals not to exceed 2 feet with No. 9 gauge aluminum coated tie wires.

F. Barbed wire extension arms shall be attached to the top of each post, inclined at an angle of 45° from the vertical. Three strands of barbed wire shall be securely fastened to all extension arms. The top strand of barbed wire shall be 12 inches from the fence line horizontally and 12 inches above the top of the fabric vertically.

G. Install privacy slats running diagonally in both directions in each link of the fabric.

END OF SECTION 32 31 13

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SECTION 32 92 20 - SEEDING AND SODDING

PART 1 - GENERAL

1.1 SCOPE

A. The work covered by this Section consists of furnishing all labor, equipment, and material required to place topsoil, seed or sod, commercial fertilizer, agricultural limestone, and mulch material, including seedbed preparation, harrowing, compacting, and other placement operations on graded earthen areas as described herein and/or shown on the Drawings. In general, seeding operations shall be conducted on all newly graded earthen areas not covered by structures, pavement, or sidewalks; all cleared or grubbed areas which are to remain as finish grade surfaces. Areas disturbed by borrow activities shall also be seeded according to these Specifications. Sodding shall be performed where specifically called for on the drawings.

B. The work shall include temporary seeding operations to stabilize earthen surfaces during construction or inclement weather and minimize stream siltation and erosion. Temporary seeding shall be performed at the times and locations necessary to minimize siltation.

1.2 QUALITY ASSURANCE

A. Prior to seeding operations, the Contractor shall furnish to the Engineer labels or certified laboratory reports from an accredited commercial seed laboratory or a state seed laboratory showing the analysis and germination of the seed to be furnished. Acceptance of the seed test reports shall not relieve the Contractor of any responsibility or liability for furnishing seed meeting the requirements of this Section.

B. Prior to topsoil operations, the Contractor shall obtain representative samples of the topsoil and furnish soil test certificates including textural, pH, organic content analyses and recommendations for liming and fertilizing from the State University Agricultural Extension Services or other certified testing laboratory.
   1. SPECIAL NOTE TO CONTRACTOR: The requirements and procedures of this section are intended as a guide. If the Contractor can demonstrate the ability to establish a satisfactory coverage of healthy grass of the type specified for meadow and embankments, he will not be required to conform to the exact requirements of this section of the specifications.

C. Installer Qualifications: A qualified landscape installer whose work has resulted in successful turf establishment.
   1. Experience: Three years experience in turf installation.

1.3 SUBMITTALS

A. Submit in accordance with Section 01 33 00.

B. Product Data: For each product specified showing compliance with specifications.

C. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture, stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.

D. Product Certificates: For each product specified.

E. Qualification Data: For landscape installer.

F. Maintenance Data: Recommended procedures to be established by Owner for maintenance of turf during a calendar year. Submit before expiration of required maintenance periods.

PART 2 - PRODUCTS

2.1 GENERAL

A. Species, rate of seeding, fertilization, and other requirements shall meet the minimum requirements of Section 860 of ALDOT Standard Specifications for Highway Construction, latest edition unless otherwise dictated by the plans.

2.2 TOPSOIL

A. The Contractor shall place a minimum of 4 inches of topsoil over all graded earthen areas and over any other areas to be seeded. Sources of topsoil shall be approved by the Engineer prior to disturbance. No additional compensation will be allowed for spreading of topsoil.

B. Topsoil shall be a friable loam containing a large amount of humus and shall be original surface soil of good, rich, uniform quality, free from any material such as hard clods, stiff clay, hardpan, partially disintegrated stone, pebbles larger than ½-inch in diameter, lime, cement, bricks, ashes, cinders, slag, concrete, bitumen or its residue, boards, sticks, chips, or other undesirable material harmful or unnecessary to plant growth. Topsoil shall be reasonably free from perennial weeds and perennial weed seeds, and shall not contain objectionable plant material, toxic amounts of either acid or alkaline elements or vegetable debris undesirable or harmful to plant life.

C. Topsoil shall be natural topsoil without admixture of subsoil material, and shall be classifiable as loam, silt loam, clay loam, sandy loam, or a combination thereof. The pH shall range from 5.5 to 7.0. Topsoil shall contain not less than 5% or more than 20%, by weight, of organic matter as determined by loss on ignition of oven-dried samples to 65°C.

2.3 SEED

A. Seed shall be delivered in new bags or bags that are sound and labeled in accordance with the U. S. Department of Agriculture Federal Seed Act.

B. All seed shall be from the last crop available at time of purchase and shall not be moldy, wet, or otherwise damaged in transit or storage.

C. Seed shall bear the growers analysis testing to 98% for purity and 90% for germination. At the discretion of the Engineer samples of seed may be taken for check against the grower's analysis.

D. Species, rate of seeding, fertilization, and other requirements are shown in the Seeding Requirements Table.

2.4 SOD

A. All grass sod shall be replaced with the same type as is removed. If type cannot be determined, sod type shall be centipede.

B. All grass shall be native to the locality of the Work.

C. All sod shall be procured from areas where the soil is fertile and contains a high percentage topsoil and where the grass is well rooted and full grown.

D. Mechanical devices, such a sod cutters, may be used for cutting the sod into strips, blocks or rolls at least 12 inches wide with depth of ¾-inch of soil removed with the turf.

E. Sections of sod shall be cut away below the root line and shall be removed in such a manner that no tearing or breaking will occur. Approved mechanical methods will be permitted. All broken or dried sod shall be rejected.

F. The sod shall, in general, be transplanted within three (3) days from the time it is harvested. Temporary storage shall be in a cool, moist, shady location with the grass side up.

G. In no event shall more than 10 days elapse between the cutting and planting of the sod.

2.5 FERTILIZER AND LIMING MATERIALS

A. Fertilizer and liming materials shall comply with applicable state, local, and federal laws concerned with their production and use.

B. Commercial fertilizer shall be a ready mixed material and shall be equivalent to the grade or grades specified in the Seeding Requirements Table. Container bags shall have the name and address of the manufacturer, the brand name, net weight, and chemical composition.

C. Agricultural limestone shall be a pulverized limestone having a calcium carbonate content of not less than 85% by weight. Agricultural limestone shall be crushed so that at least 85% of the material will pass a No. 10 mesh screen and 50 percent will pass a No. 40 mesh screen.

2.6 MULCH MATERIAL

A. All mulch materials shall be air dried and reasonably free of noxious weeds and weed seeds or other materials detrimental to plant growth.

B. Mulch shall be composed of wood cellulose fiber, straw, or stalks, as specified herein. Mulch shall be suitable for spreading with standard mulch blowing equipment.

C. Wood-cellulose fiber mulch shall be as manufactured by Weyerhauser Company, Conway Corporation, or equal.

D. Straw mulch shall be partially decomposed stalks of wheat, rye, oats, or other approved grain crops.

E. Stalks shall be the partially decomposed, shredded residue of corn, cane, sorghum, or other approved standing field crops.

2.7 MULCH BINDER

A. Mulch on slopes with 3 to 1 ratio or steeper shall be held in place by the use of an approved mulch binder. The mulch binder shall be non-toxic to plant life and shall be acceptable to the Engineer.

B. Emulsified asphalt binder shall be Grade SS-1, ASTM D 977. Cut-back asphalt binder shall be Grade RC 70 or RC 250.

2.8 INOCULANTS FOR LEGUMES

A. All leguminous seed shall be inoculated prior to seeding with a standard culture of nitrogen-fixing bacteria that is adapted to the particular seed involved.

2.9 WATER

A. Water shall be clean, clear water free from any objectionable or harmful chemical qualities or organisms and shall be furnished by the Contractor.

PART 3 - EXECUTION

3.1 SECURING AND PLACING TOPSOIL

A. Topsoil shall be secured from areas from which topsoil has not been previously removed, either by erosion or mechanical methods. Topsoil shall not be removed to a depth in excess of the depth approved by the Engineer.

B. The area or areas from which topsoil is secured shall possess such uniformity of soil depth, color, texture, drainage, and other characteristics as to offer assurance that, when removed the product will be homogeneous in nature and will conform to the requirements of these Specifications.

C. All areas from which topsoil is to be secured, shall be cleaned of all sticks, boards, stones, lime, cement, ashes, cinders, slag, concrete, bitumen, or its residue, and any other refuse which will hinder or prevent growth.

D. In securing topsoil from a designated pit, or elsewhere, should strata or seams of material occur which do not come under the requirements for topsoil, such material shall be removed from the topsoil, or if required by the Engineer, the pit shall be abandoned.

E. Before placing or depositing topsoil upon any areas, all improvement within the area shall be completed, unless otherwise approved by the Engineer.

F. The areas in which topsoil is to be placed or incorporated shall be prepared before securing topsoil for use.

3.2 SEEDBED PREPARATION

A. Before fertilizing and seeding, the topsoil surfaces shall be trimmed and worked to true line free from unsightly variation, bumps, ridges and depressions, and all detrimental material, roots, and stones larger than 3 inches in any dimension shall be removed from the soil.

B. No earlier than 24 hours before the seed is to be sown, the soil surface to be seeded shall be thoroughly cultivated to a depth of not less than 2 inches with a weighted disc, tiller, pulvimixer, or other equipment, until the surface is smooth and in a condition acceptable to the Engineer.

C. If the prepared surface becomes eroded as a result of rain or for any other reason, or becomes crusted before the seed is sown, the surface shall again be placed in a condition suitable for seeding.

D. Ground preparation operations shall be performed only when the ground is in a tillable and workable condition, as determined by the Engineer.

3.3 FERTILIZATION AND LIMING

A. Following seedbed preparation, fertilizer shall be applied to all areas to be seeded so as to achieve the application rates shown in the Seeding Requirements Table.

B. Fertilizer shall be spread evenly over the seedbed and shall be lightly harrowed, raked, or otherwise incorporated into the soil for a depth of ½-inch.

C. Fertilizer need not be incorporated in the soil as specified when mixed with seed in water and applied with power sprayer equipment. The seed shall not remain in water containing fertilizer for more than 30 minutes when a hydraulic seeder is used.

D. Agricultural limestone shall be thoroughly mixed into the soil according to the rates in the Seeding Requirements Table. The specified rate of application of limestone may be reduced by the Engineer if pH tests indicate this to be desirable. It is the responsibility of the Contractor to obtain such tests and submit the results to the Engineer for adjustment in rates.

E. It is the responsibility of the Contractor to make one application of maintenance fertilizer according to the recommendations listed in the Seeding Requirements Table.

3.4 SEEDING

A. Seed of the specified group shall be sown as soon as preparation of the seedbed has been completed. No seed shall be sown during high winds, nor until the surface is suitable for working and is in a proper condition. Seeding mixture and rates shall be as shown in the Seeding Requirements table unless otherwise approved by the Engineer. Seed mixtures may be sown together provided they are kept in a thoroughly mixed condition during the seeding operation.

B. Seeds shall be uniformly sown by any approved mechanical method to suit the slope and size of the areas to be seeded, preferably with a broadcast type seeder, windmill hand seeder, or approved mechanical power drawn seed drills. Hydro-seeding and hydro-mulching may be used on steep embankments, provided full coverage is obtained. Care shall be taken to adjust the seeder for seedings at the proper rate before seeding operations are started and to maintain their adjustment during seeding. Seed in hoppers shall be agitated to present segregation of the various seeds in a seeding mixture.

C. Immediately after sowing, the seeds shall be covered and compacted to a depth of ⅛ to ⅜-inch by a cultipacker or suitable roller.

D. Leguminous seeds shall be inoculated prior to seeding with an approved and compatible nitrogen-fixing inoculant in accordance with the manufacturer's mixing instructions.

3.5 SODDING

A. All areas indicated on the drawings shall be solid sodded.

B. The sod shall be placed with the edges in close contact. Acceptable loamy topsoil may be used to fill the joints.

C. The entire areas shall then be packed into place.

3.6 MULCHING

A. All seeded areas shall be uniformly mulched in a continuous blanket immediately after seeding. The mulch shall be applied so as to permit some sunlight to penetrate and the air to circulate and at the same time shade the ground, reduce erosion, and conserve soil moisture. Approximately 25% of the ground shall be visible through the mulch blanket.

B. One of the following mulches shall be spread evenly over the seeded areas at the following application rates:
   1. Wood Cellulose Fiber - 1,400 lbs/acre
   2. Straw - 4,000 lbs/acre
   3. Stalks - 4,000 lbs/acre
   4. These rates may be adjusted at the discretion of the Engineer at no additional cost to the Owner, depending on the texture and condition of the mulch material and the characteristics of the seeded area.

C. Mulch shall be lightly disked into the soil using straight disks and shall be compacted using a cultipacker.

D. Mulch on slopes with 3 to 1 ratio or steeper shall be held in place by the use of an approved mulch binder. Binder shall be thoroughly mixed and applied with the mulch. Emulsified asphalt or cutback asphalt shall be applied at the approximate rate of 5 gallons per 1,000 square feet as required to hold the mulch in place.

E. The Contractor shall cover structures, poles, fence, and appurtenances if the mulch binder is applied in such a way that it would come in contact with or discolor the structures.

F. Mulch and binder shall be applied by suitable blowing equipment at closely controlled application rates in a manner acceptable to the Engineer.

3.7 WATERING

A. Contractor shall be responsible for maintaining the proper moisture content of the soil to insure adequate plant growth until a satisfactory stand is obtained. Watering shall be performed to maintain adequate water content in the soil until the project is accepted by the Owner.

B. Watering shall be accomplished by hoses, tank truck, or sprinklers in such a way to prevent erosion, excessive runoff, and overwatered spots.

3.8 MAINTENANCE

A. Upon completion of seeding operations, the Contractor shall clear the area of all equipment, debris, and excess material and the premises shall be left in a neat and orderly condition.

B. The Contractor shall maintain all established areas without additional payment until final acceptance of the work by the Owner, and any regrading, refertilizing, reliming, reseeding, or remulching shall be done at his own expense. The work shall be repeated on defective areas until a satisfactory uniform stand is accomplished. Damage resulting from erosion, gulleys, washouts, or other causes shall be repaired by filling with topsoil, compacting, and repeating the seeding work at his expense.

SEEDING REQUIREMENTS TABLE						
				Rates per 1,000 Square Feet		
Area	**Sowing Season**	**Species**	**Seed**	**Fertilizer**	**Limestone**	**Maintenance****
Flat to rolling terrain with slopes less than 3:1	3/1 to 6/1	Kentucky 31 Fescue Weeping Lovegrass	4 lbs. ¼ lb.	30 lbs. 6-12-12	200 lbs.	15 lbs. 10-10-10
	9/1 to 3/1	Kentucky 31 Fescue Weeping Lovegrass Annual Ryegrass	4 lbs. ¼ lb. 2 lbs.	30 lbs. 6-12-12	200 lbs.	15 lbs. 10-10-10
Embankments with slopes greater than 3:1	3/1 to 6/1	Crownvetch* Kentucky 31 Fescue Weeping Lovegrass	1 lb. 2 lbs. ¼ lb.	30 lbs. 6-12-12	200 lbs.	10 lbs. 0-20-20
	9/1 to 3/1	Crownvetch* Kentucky 31 Fescue Annual Ryegrass	1 lb. 2 lbs. 2 lbs.	30 lbs. 6-12-12	200 lbs.	10 lbs. 0-20-20
*Requires inoculation						
**Maintenance fertilizer shall be applied in early spring following initial establishment cover						

END OF SECTION 32 92 20

SECTION 33 01 30.83 - SANITARY SEWER MANHOLE COATING

PART 1 - GENERAL

1.1 SUMMARY

A. Scope: The section applies to reconditioning existing manholes.

B. Section Includes:
1. Cleaning of interior surfaces of manholes
2. Surface preparation for coating
3. Cleanup of sand or debris from cleaning and surface prep
4. Rebuilding the concrete with cementitious materials as needed
5. Application and curing of coating
6. Cleanup.

1.2 SUBMITTALS

A. Submit in accordance with Section 01 33 00.

B. Product Data:
1. Technical data sheet on each product used.
2. Material Safety Data Sheet (MSDS) for each product used.
3. ASTM references.
4. Descriptive literature, bulletins, and/or catalogs of materials.

C. Installation Instructions:
1. Work procedures including flow diversion plan, method of repair, etc.
2. Method of repair of leaks or cracks in manholes.

D. Inspection Reports: Final installation report on completed manholes.

E. Certificates: Contractor shall provide documentation that they are an approved installer and licensed by the monolithic surfacing manufacturer and specialized equipment supplier.

F. Warranty: 10-yr warranty of both manufacturer and applicator.

1.3 QUALITY ASSURANCE

A. Product Options and Alternatives:
1. The Specifications include specific product names that are approved for installation in this Contract. Whenever product names are specified followed by the phase "or equal," the specific products mentioned shall be understood as establishing the type, function, dimension, appearance and quality desired.
2. Alternative coating systems will be considered. Requests for approval of alternative coating systems shall include the manufacturer’s descriptive literature for each product,

giving name, product number, and generic type, manufacturer's recommended installation procedure, required testing lab results, and other information as deemed necessary by the engineer to determine the suitability of the substitute. Pre-approval requests must be submitted no later than 10-days prior to bid opening. This time allows the Engineer time to determine if the proposed lining system will meet all of the requirements of these specifications. All alternative coating systems shall also provide a record of experience showing no less than 5-years of experience coating sanitary sewers manholes. Pre-approval package must also include:

a. An affidavit executed under seal by an officer of the Manufacturer stating that if their proposed coating system is used on this project; the Manufacturer will warrant the finished, in-place, coating system for a minimum of 10 years from the installation date. Documentation shall be provided which lists these installations showing customer, location, diameter and depths of manholes coated and product used.

b. An affidavit executed under seal by an officer of the Manufacturer stating that the proposed coating system has been successfully installed in a minimum of 2,500 sanitary sewer manholes over the last 3 years in the United States.

3. The Owner will decide which alternate products to accept based upon all the information submitted. If an alternate product is accepted it shall be named in an addendum. The Owner's decision regarding evaluation and acceptance of alternate products shall be final and binding.

B. Qualifications of Applier:

1. The Contractor shall apply the system and be responsible for the complete performance of the system, including materials, application and quality control. Contractor shall provide documentation that they are an approved installer and licensed by the monolithic surfacing manufacturer and specialized equipment supplier. The Applicator shall have at least 3 years experience with the coating system proposed and shall have coated a minimum of 50,000 sq. ft. of similar surfaces with the product.

C. Experience and Sole-Source Responsibility

1. The manufacturer/installer of the liner system shall be a company that specializes in the design and manufacture/installation of corrosion protection systems for manholes. The installer shall be completely trained in leak repair, surface preparation and materials application on manholes.
2. To ensure total unit responsibility, all materials and installation shall be furnished and installed by one supplier/installer who assumes full responsibility of the entire coating system.

D. Coating systems which include cementitious material will not be considered.

1.4 REFERENCE STANDARDS

A. The following ASTM standards are referenced herein:

1. ASTM C 297 – Flatwise Tensile Strength of Sandwich Constructions.
2. ASTM D 93 – Standard Test Methods for Flash Point by Pensky-Martens Closed Cup Tester
3. ASTM D 412 – Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers – Tension.
4. ASTM D 543 – Water Vapor Transmission of Organic Coating Films.

5. ASTM D 543 – Resistance of Plastics to Chemical Reagents.
6. ASTM D 695 – Compressive Properties of Rigid Plastics.
7. ASTM D 638 – Tensile Properties of Plastics.
8. ASTM D 790 – Flexural Properties of Unreinforced and Reinforced Plastics.
9. ASTM D 1737 – Method of Test for Elongation of Attached Organic Coatings with Cylindrical Mandrel Apparatus.
10. ASTM D 2240 – Durometer Hardness, Type D.
11. ASTM D 2584 – Volatile Matter Content.
12. ASTM D 4060 – Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser
13. ASTM D 4541 – Pull-off Strength of Coatings Using a Portable Adhesion Tester.

B. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.5 WARRANTY

A. The supplied lining system shall include a 10-year limited warranty covering both materials AND installation beginning on the date of final acceptance. Both the Manufacturer and the Applicator shall stand behind this warranty for 10 years. An affidavit executed under seal by an officer of the Manufacturer stating that the Manufacturer will warrant the finished, in-place, lining system against infiltration and corrosion for a minimum of 10 years from the installation date will be required to accompany the installers written warranty.

PART 2 - PRODUCTS

2.1 100% SOLIDS EPOXY OR POLYURETHANE MANHOLE LINING SYSTEM

A. Product Requirements: The manhole lining system shall be spray-applied 100% solids epoxy or 100% polyurethane monolithic surfacing system for use in sewer manholes.

B. The 100% solids epoxy lining system shall be one of the following products:
1. Warren Environmental System 100% Solids Epoxy
2. Raven Lining Systems 100% Solids Epoxy
3. Or Equal

C. The 100% polyurethane lining system shall be:
1. Spraywall
2. Or Equal

D. In order to be considered as an equal a product will have the following minimum characteristics as measured by the applicable ASTM standards referenced herein:
1. Minimum Compressive Strength: 12,000 psi
2. Minimum Tensile Strength: 7,400 psi
3. Minimum Flexural Strength: 12,000 psi
4. Minimum Tensile Elongation: 4%
5. Minimum Bond Strength: 900 psi
6. Minimum Corrosion Resistance: suitable for environments PH of 0.5

E. In order for a product to be considered equal the final product must be tested to meet or exceed the minimum standards included in this specification. A bonded third party testing company must perform the testing.

F. The product shall provide a minimum anticipated service life of 20 years. It shall be guaranteed by the coating manufacturer for 10 years.

G. The interior surfacing system shall be continuously bonded to all brick, mortar, concrete, chemical sealant, grout, pipe and other surfaces inside the manhole according to ASTM C 882 testing and therefore shall be designed for hydrostatic loading.

2.2 MULTI-COMPONENT STRESS PANEL LINING SYSTEM

A. Product Requirements: The manhole lining system shall be multi-component lining system for use in sewer manholes. The multi-component lining system shall be SpectraShield. The multi-component lining system shall be a multi-component stress panel liner system as described below:

1. Liner

Layer	**Material**
Moisture barrier	Modified Polymer
Surfacer	Polyurethane/Polymeric blend
Final corrosion barrier	Modified polymer

2. Modified polymer shall be sprayable, solvent free, two-component polymeric, moisture/chemical barrier specifically developed for the corrosive wastewater environment.

TYPICAL CHEMICAL ANALYSIS		
"A" Component		
Viscosity, 77 °F, cps., ASTM D1638	300-400	
Physical State	Liquid	
Color	Clear to amber	
Hygroscopicity	Reacts with water	
"B" Component		
Viscosity, 77 °F, cps., ASTM D1638	400-600	
Physical State	Liquid	
Color	Flamingo Pink	
Non-Volatile	100%	
Reaction Profile (100 grams, 175 °F sample)		
Gel Time, seconds	1-2	
Tack Free Time, seconds	15	
Cure Time, seconds	30	
Processing		
A Component/B Component, volume ratio	1.00/1.00	
TYPICAL PHYSICAL PROPERTIES		
Tensile Strength (PSI)	ASTM D412	4280
Elongation (%)	ASTM D412	200
100% Module	ASTM D412	2200
300% Module	ASTM D412	2600
Tear Strength (PLI)	ASTM D2240	350
Hardness (shore D)	ASTM D1737	60D
Flexibility (1/8" Mandrel)	ASTM D1737	Pass
Flashpoint (°F)	ASTM Pensky-Martin	>200
Taber Abrasion (mg loss)	ASTM D4060	52

3. Polyurethane Rigid Structure, low viscosity two-component, containing flame retardants.

TYPICAL CHEMICAL ANALYSIS	
"A" Component	
Viscosity, 77 °F, cps., ASTM D1638	200
Physical State	Liquid
Color	Dark Brown
Hygroscopicity	Reacts with water and evolves CO2 gas
"B" Component	
Viscosity, 77 °F, cps., ASTM D1638	600-1000
Physical State	Liquid
Color	Tan
Hygroscopicity	Absorbs water rapidly thus changing ratio
Reaction Profile (100 grams, 77 °F sample)	
Cream Time, seconds	1-4
Tack Free Time, seconds	5-8
Rise Time, seconds	6-10
Processing	
A Component/B Component, volume ratio	1.00/1.00

4. Total thickness of multi-component stress panel liner shall be a minimum of 500 mils.

2.3 CONCRETE REPAIR

A. Materials: A quick setting cementitious material meeting the following requirements shall be used as a patching mix:

Compressive Strength	ASTM C 579 B	1400 psi @ 6 hr
Shrinkage	ASTM C 596	0% @ 90% relative humidity
Bond	ASTM C 321	140 psi @ 28 days
Density (when applied)		±105 pcf

2.4 CHEMICAL GROUT

A. Used for stopping active infiltration in concrete and masonry manholes and filling exterior soil voids:
   1. Grout shall be Avanti AV-100, Scotch-Seal 5610, Prime Resins Prime-Flex920, or equivalent.

PART 3 - EXECUTION

3.1 GENERAL

A. Planning:
   1. Details of the structure size, condition (including a picture), location and a recommendation of new thickness shall be submitted to the Engineer. Engineer may then approve additional thickness to be paid for based on the appropriate pay item.
   2. The cured surfacing shall be monolithic with proper sealing connections to all unsurfaced areas and shall be placed and cured in conformance with the recommendations of the monolithic surfacing system manufacturer.
   3. When cured, the system shall form a continuous, tight-fitting, hard, impermeable surfacing that is suitable for sewer system service and chemically resistant to any chemicals, bacteria or vapors normally found in domestic sewage.
   4. The system shall effectively seal the interior surfaces of the manhole and prevent any penetration or leakage of groundwater infiltration.
   5. The system shall be compatible with the thermal conditions of the existing sewer manhole surfaces.

B. Equipment Requirements: Heated, plural component, specially designed equipment for use in the spray or spincast application of the specified system approved for use by the monolithic surfacing system manufacturer.

3.2 PRE-COAT INSPECTION

A. Applicator shall inspect all surfaces specified to receive the monolithic surfacing system prior to surface preparation.

B. Applicator shall notify Owner in writing of any detects in the surfaces that may interfere with the proper preparation or application of the monolithic surfacing system.

3.3 SURFACE PREPARATION

A. All contaminants including: all oils, grease, incompatible existing coatings, waxes, efflorescence, sealers, salts, or other contaminants shall be removed.

B. Surface Preparation:
   1. Surface preparation method(s) shall be based upon the conditions of the substrate and the requirements of the monolithic surfacing system to be applied.
   2. Surfaces to receive protective coating shall be cleaned and abraded to produce a sound concrete surface with adequate profile and porosity to provide a strong bond between the monolithic surfacing system and the substrate.
   3. The first procedure upon entering each structure will be to blast all specified surfaces by low pressure water cleaning as defined by NACE Standard 5.
   4. All concrete that is not sound or has been damaged by chemical exposure shall be restored to a sound concrete surface using cementitious material specified under the heading “CONCRETE REPAIR”.
   5. When all loose or contaminated debris has been removed, the surface will be acid etched with a 20% muratic acid solution to clean and open the pores of the substrate.
   6. Then the surface shall be water blasted by the use of a hand held wand again.

7. The wash water shall include a dilute solution of chlorine to diminish microbiological bacteria growth and to kill any bacteria residing on or in the surface.
8. The surface will be tested at this point to ensure that the pH is within acceptable limits (not to exceed 8.5).
9. These tests will be performed in the presence of the Engineer with litmus paper on various areas within the structure.
10. All test results will be retained by the Contractor.

C. Additional Cleaning or Profiling:
1. Surfaces that require additional cleaning or profiling will be prepared by abrasive blast to rough the surface sufficient to obtain and ensure adequate bonding of the system.
2. A minimum surface profile of 8-10 mils or 10% of the total recommended coating system thickness must be achieved to assure proper adhesion.
3. Detergent water cleaning and hot water blasting may be necessary to remove oils and grease from the concrete.
4. Whichever methods are used, they shall be performed in a manner that provides a uniform, sound clean surface that is not excessively damaged.

D. Active water infiltration shall be stopped by using a hydroactive grout material specified under the heading "CHEMICAL GROUT."

3.4 APPLICATION OF FIELD APPLIED INTERIOR SURFACING SYSTEM

A. Application procedures shall conform to the recommendations of the interior surfacing system manufacturer, including material handling, mixing, and environmental controls during application, safety, and equipment.

B. The equipment shall be specially designated to accurately ratio and apply the specified materials and shall be regularly maintained and in proper working order.

C. All manhole surfaces shall be lined with the surfacing system to provide an average total thickness of 250 mils for the monolithic lining system or 500 mils for the multi-component stress panel liner system. The cured surfacing shall be monolithic with proper sealing connections to all unsurfaced areas and shall be placed and cured in accordance with the recommendations of the monolithic surfacing system manufacturer. Specially designed spray application equipment shall be used to apply each coat of the system.

3.5 TESTING AND INSPECTION

A. A spark test shall be performed to identify any small holes in the coating. Any areas where the spark test indicates a hole, the coating shall be re-coated and re-tested.

B. A final visual inspection of the lining system shall be made by the Engineer and Applicator. Any deficiencies in the finished system shall be marked and repaired according to the procedures set forth by Applicator.

3.6 CONCRETE REPAIR

A. Applied according to the manufacturer's recommendations.

3.7 CHEMICAL GROUT

A. A pre-mixed quick set chemical grout shall be injected through the manhole wall to form a watertight seal on the exterior of the manhole and fill voids in soils immediately adjacent to the manhole wall.

B. Grout mixing, additive/accelerators, preparation, and application shall be in accordance with manufacturer's requirements. Grout pumping equipment shall have metering device to document gallons of grout pumped.

3.8 MEASUREMENT AND PAYMENT

A. Measurement will be in vertical feet of manhole coated.

B. Payment will be at the Per Vertical Feet price included in the Bid Schedule.

END OF SECTION 33 01 30.83

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SECTION 33 05 13 - PRECAST MANHOLES

PART 1 - GENERAL

1.1 SCOPE

A. The work covered by this section includes furnishing all labor, equipment, and materials required to install precast concrete manholes as described herein and/or shown on the Drawings.

1.2 DESIGN CRITERIA

A. Manholes shall be constructed of specified materials to the sizes, shapes, and dimensions and at the locations shown on the Drawings or as otherwise directed by the Engineer. The height or depth of the manhole will vary with the location, but unless shown otherwise on the Drawings shall be such that the top of the manhole frame will be at the finished grade of the pavement or ground surface and the invert will be at the designed elevations.

B. Where the difference in the invert elevation of a sewer 18 inches in diameter or smaller and any other sewer intersecting in one manhole is 2 feet or more, a drop manhole shall constructed as shown on the Drawings. They shall be similar in construction to the standard manhole except that a drop connection of pipe and fittings of the proper size and material shall be constructed outside the manhole and supported by Class A concrete.

1.3 QUALITY ASSURANCE

A. Prior to delivery all basic materials specified herein shall be tested and inspected by an approved independent commercial testing laboratory or, if approved by the Engineer, certified copies of test reports prepared by the manufacturer's testing laboratory will be acceptable. All materials which fail to conform to these specifications shall be rejected.

B. After delivery to the site, any materials which have been damaged in transit or are otherwise unsuitable for use in the work shall be rejected and removed from the site.

1.4 SHOP DRAWINGS AND ENGINEERING DATA

A. Complete shop drawings and engineering data on frames, covers, steps, and precast manhole sections shall be submitted to the Engineer in accordance with the requirements of the section entitled "Submittals" of these Specifications.

1.5 SHOP PAINTING

A. Frames, covers, and steps shall be cleaned, shop primed, and shop painted with a bituminous paint in accordance with the requirements of the section entitled "General Materials Stipulations" of these Specifications.

PART 2 - PRODUCTS

2.1 BRICK

A. Brick used in manhole construction shall be solid or cored, medium hard or better, Grade SM brick conforming to requirements of ASTM C 32 for sewer and manhole brick.

2.2 MORTAR

A. Mortar for brick manhole construction shall be sand-cement mortar composed of one part Portland cement to two (2) parts clean sand conforming to ASTM C 144. Twenty (20) pounds of hydrated lime per sack of cement may be added. No retempered mortar shall be used.

2.3 PRECAST CONCRETE MANHOLES

A. Precast concrete manholes shall consist of precast reinforced concrete sections, a conical or flat slab top section, and a base section conforming with the typical manhole details as shown on the Drawings.

B. Precast manhole sections shall be manufactured, tested, and marked in accordance with the latest provisions of ASTM C 478.

C. The minimum compressive strength of the concrete for all sections shall be 4,000 psi. Special corrosion resistant concrete utilizing Type II Portland Cement (ASTM Standard) with Class "F" fly ash or New-Cem by Blue Circle Cement must be used. The latest version of ASTM C 618 classification must be followed for chemical requirements, physical properties, and for all other technical and non-technical specifications. Verification of fly ash characteristics must be down according to the latest edition of ASTM C 311. Contractor to verify that supplier of fly ash has a quality control program in conformance with ASTM C 618. Proportioning of fly ash or New-Cem shall be as recommended by the manufacturer. The Contractor shall provide certification to the Engineer indicating that all precast manhole sections meet the Corrosion Resistant Cement requirements.

D. The maximum allowable absorption of the concrete shall not exceed 8% of the dry weight.

E. The circumferential reinforcement in the riser sections, conical top sections, and base wall sections shall consist of one line of steel and shall be not less than 0.12 square inches per lineal foot.

F. The ends of each reinforced concrete manhole riser section and the bottom end of the manhole top section all be so formed that when the manhole risers and the top are assembled, they will make a continuous and uniform manhole.

G. Precast reinforced concrete manhole sections shall conform to ASTM Specification C-478. All joints for precast sections shall be tongue and groove and shall be approved by the Engineer. All pipe connections to precast manholes shall use a flexible rubber sleeve cast into the manhole section and stainless steel clamps.

H. Each section of the precast manhole shall have not more than two (2) holes for the purpose of handling and laying. These holes shall be tapered and shall be plugged with mortar after installation.

I. All interior surfaces of the manhole sections shall be given a brush clean or light brush sandblast and shall be coated with 2 coats of Indurall Ruff Stuff 2100 coal tar epoxy or equal, minimum dry thickness of 8 mils per coat.

J. Manhole steps shall be installed in each section of the manhole in accordance with the details on the Drawings. Maximum distance from the top manhole step to the top of the frame shall be 16 inches or less.

2.4 FRAMES, COVERS, AND STEPS

A. Manhole frames and covers shall be cast iron conforming to the minimum requirements of Federal Specifications WW-I-652 or to ASTM A 48 for Class 30 Gray Iron Castings. All castings shall be made accurately to the required dimensions, fully interchangeable, sound, smooth, clean, and free from blisters and/or other defects. Defective castings which have been plugged or otherwise treated shall not be used. All castings shall be thoroughly cleaned and painted or coated with a bituminous paint. Each casting shall have its actual weight in pounds stenciled or painted on it in white paint.

B. Manhole steps conforming to the applicable provision of ASTM Standard Specification Serial Designation C478 such as "Wedg-Lok" as manufactured by Delta Pipe Products. Steps shall be constructed of ½-inch steel rod completely encased in a corrosion-resistant rubber. Each step shall have a vertical load resistant of 400 lbs. and a pull out resistance of 500 lbs. per leg. Steps shall have foot guide lugs and tracting cleats.

C. Standard manhole frames and covers shall have a minimum of 24 inches clear inside diameter and shall be a minimum of 7 inches high, with guide ring, and shall weigh not less than 310 pounds, total. Frame and cover shall be Vulcan Foundry No. VM-3MOD, Neenah Foundry No. R-1668, U.S. Foundry No. 360-F, or approved equal.

D. Watertight manhole covers shall be furnished with a rubber gasket, stainless steel bolts, machined bearing surfaces, and concealed water tight pickhole, and shall weigh not less than 345 pounds, and have minimum of 22 inches clear inside diameter and shall be a minimum of 7 inches high. Frame and cover shall be Vulcan Foundry No. VM-80WT, U.S. Foundry No. 604-AU-BWT, Neenah Foundry No. R-1915-H2, or approved equal.

E. All sanitary sewer manhole covers shall have the word "SEWER" cast on the top in letters 2 inches high.

F. The contact surfaces of all manhole covers and the corresponding supporting rings in the frames shall be machined to provide full perimeter contact.

PART 3 - EXECUTION

3.1 CONSTRUCTION OF PRECAST CONCRETE MANHOLES

A. After placing manhole base, inverts shall be constructed using Class B concrete in accordance with details on contract drawings and inverts shall have the same cross section as the invert of the sewers which they connect. The manhole invert shall be carefully formed to the required size and grade by gradual and even changes in sections. Changes in direction of flow through the sewer shall be made to a true curve with as large a radius as the size of the manhole will permit.

B. After the base section has been set, and inverts formed, the precast manhole sections shall be placed thereon, care being exercised to form the incoming and outgoing sewer pipes into the wall of the manhole at the required elevations.

C. The cast iron frame for the manhole cover shall be set at the required elevation and properly anchored to the masonry. Where manholes are constructed in paved areas, the top surface of the frame and cover shall be tilted to conform to the exact slope, crown and grade of the existing adjacent pavement.

D. Masonry work shall be allowed to set for a period of not less than 24 hours. Outside forms, if any, then shall be removed and the manhole backfilled and compacted. All loose or waste material shall be removed from the interior of the manhole. The manhole cover than shall be placed and the surface in the vicinity of the work cleaned off and left in a neat and orderly condition.

E. After backfilling has been completed, the excavated area, if located in a street, alley or sidewalk, shall be provided with a temporary surface.

3.2 FIELD INSPECTION

A. After completion, all manholes will be inspected. The Contractor shall make, at his own expense, all necessary changes, modifications, and/or adjustments required to assure satisfactory operation.

3.3 MANHOLE TESTING

A. All manholes constructed shall be watertight and shall show no visible sign of leakage. Any manhole which shows visible sign of leakage shall be repaired or replaced even if it passes the leakage test. Each manhole shall be tested after assembly and shall be tested by one (1) of the following methods:

1. Manhole Exfiltration Test: The test shall be conducted by the Contractor in coordination with the Engineer. All incoming and outgoing sewer lines shall be plugged and the manhole filled with water to a level above the highest section joint. If the water level drop exceeds 1/8" per vertical foot of manhole depth in 5 minutes, the manhole shall have failed the test and shall be repaired or replaced at the expense of the Contractor and re-tested until it passes.
2. Manhole Vacuum Test: The test shall be conducted in accordance with ASTM C-1244 by the Contractor in coordination with the Engineer. Each manhole shall be tested, after assembly in accordance with ASTM C-1244, as follows: All pipe openings shall be sealed by installing suitable plugs that completely isolate the manhole structure; any other

openings such as lifting holes, shall be permanently sealed. A suitable vacuum pump shall be connected to the manhole, and a vacuum of 10" of Hg drawn. The pump shall then be isolated from the manhole by valving, and the test period begun. The test shall be successful if the vacuum remains at 9" of Hg or greater according to the following table:

Minimum Test Times (seconds)			
	Diameter (feet)		
Depth (feet)	**4**	**5**	**6**
6 or less	16	20	26
8	21	27	34
10	26	34	42
12	31	40	49
14	37	48	59
16	42	54	68
18	47	61	75
20	52	68	84

B. All manholes which fail the test shall be repaired or replaced at the expense of the Contractor until the manhole passes the test.

C. The cost of this testing shall be included in the price bid for manholes.

END OF SECTION 33 05 13

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SECTION 33 05 50 - POLYVINYL CHLORIDE (PVC) PRESSURE PIPE

PART 1 - GENERAL

1.1 SCOPE

A. The work covered by this section includes furnishing all labor, equipment, and materials required to install and test polyvinyl chloride (PVC) pressure pipe, including valves, unions, fittings, couplings, adaptors, and accessories, as shown on the Drawings and/or specified herein.

B. The Contractor's attention is called to the fact that all PVC piping and accessories are not necessarily shown completely on the Drawings which are more or less schematic. However, the Contractor shall furnish and install all piping indicated or required for proper operation of the equipment or services requiring such piping.

C. Contractor's work includes collecting samples and having samples checked and approved for bacteriological analysis by the State Board of Health for water lines.

1.2 RELATED WORK ELSEWHERE

A. Section 31 00 01 – Earthwork for Utility Lines

B. Section 33 05 51 - Ductile Iron Piping and Ductile Iron and Cast Iron Fittings

1.3 QUALITY ASSURANCE

A. The Contractor, at the Engineer's request, shall furnish a certificate from the manufacturer of the pipe and fittings that the manufacturer is fully competent and capable of manufacturing PVC pipe and fittings of uniform texture and strength that will fully comply with these specifications and have so manufactured this class of pipe in sufficient quantities to be certain that it will meet all normal field conditions of usage. The manufacturer must have adequate equipment and quality control facilities to be sure that each extrusion of pipe is uniform in texture, dimensions, and strength.

B. All pipe shall be tested and inspected at the place of manufacture for all requirements of the latest ASTM and Commercial Standard tests and certified copies of the test reports covering each shipment shall be submitted to the Engineer prior to laying.

C. Each length of pipe and each fitting shall have the following data clearly marked on each piece:
   1. Nominal size
   2. Type and grade of material and ASTM or AWWA standard
   3. SDR, DR, class, or schedule rating
   4. Manufacturer
   5. National Sanitation Foundation's seal of approval (for all potable water pipe)

1.4 SHOP DRAWINGS AND ENGINEERING DATA

A. Complete shop drawings and engineering data shall be submitted to the Engineer in accordance with the requirements of the section entitled “Shop Drawings, Product Data and Samples” of these Specifications.

1.5 STORAGE AND PROTECTION

A. All pipe and fitting shall be stored under cover.

B. All pipe and accessories shall be stored aboveground and fully supported so as not to bend or deflect excessively under its own weight. Height of stacked pipe shall not exceed 4 feet. Bundled pipe shall not be stacked more than two (2) bundles high.

C. Kinked, flattened, buckled, broken, or otherwise defective pipe and fittings shall not be used and shall be removed from the site.

D. Pipe shall be handled using nylon slings. Wire rope slings or chains shall not be used.

1.6 COLOR

A. Pipe used to convey potable water shall be blue or shall be color coded or marked in accordance with 62.555.320(21)(b)3 F.A.C. Pipe used to convey wastewater shall be any color other than white, blue or purple.

PART 2 - PRODUCTS

2.1 PVC PIPE AND FITTINGS

A. The pipe and fittings shall be homogenous throughout and be free from visible cracks, holes, foreign inclusions, or other injurious defects. The pipe shall be as uniform as commercially practical in color, opacity, density, and other physical properties.

B. The manufacturer shall provide waterstops, acceptable to the Engineer, which shall be applied to the outside of plastic pipe when the pipe is to be enclosed in any structure where concrete or mortar is used which will prevent leakage along the outer wall of the barrel of the pipe.

C. No single piece of pipe shall be laid on any project covered by this specification unless it is found to be generally straight. Such pipe shall have a maximum ordinate as measured from the concave side of the pipe not to exceed 1/16-inch per foot of length. If the deviation from straightness exceeds this requirement, then the particular piece of pipe shall be rejected for use until it can comply with this provision.

D. Wyes, tees, bends, and adapters and any other fittings 3" and larger required or directed by the Engineer shall be constructed of ductile iron as directed in section entitled “Ductile Iron Piping and Ductile Iron and Cast Iron Fittings” of these Specifications. Engineering data from such fittings showing cross-sectional views with dimensions shall be provided and such data and

fitting shall be approved by the Engineer prior to their use. The materials used in the manufacturer of fittings shall conform with the requirements for the pipe with which they shall be used and any variation of such requirements shall be subject to the approval of the Engineer. Fittings shall have wall thicknesses equal to or greater than that of the pipe to which they are joined.

2.2 PIPE

A. PVC pipe shown on the Drawings to be buried underground and used to convey water or wastewater shall be supplied by a major manufacturer approved by the Engineer and shall have push-on joints unless otherwise noted on the Drawings. All pipe material shall be Grade 1, Type I, polyvinyl chloride (PVC) in accordance with ASTM D 1784, Class 12454-B. All pipe material for water lines shall be National Sanitation Foundation approved for use with potable water. Pipe in sizes 1 ½ inches through 3 inches shall be SDR 21 with 200 psi pressure rating in accordance with ASTM D 2241 or DR 14, Class 200 in accordance with AWWA C900. Pipe in sizes 4 inches through 12 inches for water lines shall be either SDR 21 with 200 psi pressure rating in accordance with ASTM D 2241, DR 14, Class 200 in accordance with AWWA C900 or DR 21 or DR 25 with 200 psi pressure rating in accordance with AWWA C905, depending on which is called for on the Drawings. Pipe in sizes 4 inches through 12 inches for wastewater shall be either SDR 21 with 200 psi pressure in accordance with ASTM D 2241 or DR 21 with 200 psi pressure rating in accordance with AWWA C905. Pipe in sizes larger than 12 inch shall be either DR21 or DR25 in accordance with AWWA C905. If the type pipe is not shown on the drawings, the choice shall be the Contractor's option. Maximum lengths of pipe shall not exceed 20 feet.

2.3 FITTINGS

A. Fittings in PVC piping system for pipe smaller than 3 inches conveying water or wastewater may be PVC where the required fittings are available and with the approval of the Engineer. Such fittings shall be supplied by the same company that manufactured the pipe and shall comply with the requirements of ASTM D 2467 for Moulded, Schedule 80, socket welded fittings.

B. Fittings for pipe 3 inches or larger or unavailable in PVC, shall be cast iron or ductile iron as specified in section entitled "Ductile Iron Pipe and Ductile Iron and Cast Iron Fittings" of these Specifications. Engineering data for fitting showing cross-sectional views with dimensions shall be provided and such data and fittings shall be approved by the Engineer prior to their use. Connections between cast iron or ductile iron fittings and PVC pipe shall be made by use of special adaptors similar to Mueller Transition Gland A-399 by Mueller Company, Transition Gasket F6340 by Clow Corporation or a similar transition which has been approved by the Engineer. The joint shall be mechanical joint for ductile iron or cast iron as described in section entitled "Ductile Iron Piping and Ductile Iron and Cast Iron Fittings" of these Specifications.

2.4 JOINTS (PUSH-ON)

A. The joints shall be designed so that the pipe and fittings may be connected on the job without the use of solvent cement or any special equipment. The push-on joint shall be single rubber gasket joint designed to be assembled by the positioning of a continuous, molded, rubber ring

gasket in an annular recess in the pipe or fitting entering pipe into the socket thereby compressing the gasket radially to the pipe to form a positive seal. The gasket and the annular recess shall be so designed and shaped that the gasket is locked in place against displacement as the joint is assembled. Details of the joint design and assembly shall be in accordance with the joint manufacturer's standard practice. The joints shall be designed so as to provide for the thermal expansion or contraction experienced with a total temperature change of at least 75°F in each joint per length of pipe. The joint shall comply with ASTM D 3139. Gasket shall comply with ASTM F 477.

B. Lubricant furnished for lubricating joints shall be nontoxic, shall not support the growth of bacteria, shall have no deteriorating effects on the gasket or pipe material, and shall not impart color, taste, or odor to water. The lubricant containers shall be labeled with the manufacturer's name.

C. Gaskets shall meet all applicable requirements of ANSI A21.11. Gasket dimensions shall be in accordance with the manufacturer's standard design dimensions and tolerances. The gasket shall be of such size and shape as to provide adequate compressive force against the spigot and socket after assembly to effect a positive seal under all combinations of joint and gasket tolerances. The trade name or trademark, size, mold number, gasket manufacturer's mark and year of manufacture shall be molded in the rubber on the back of the gaskets.

D. Gaskets shall be vulcanized natural or vulcanized synthetic rubber. No reclaimed rubber shall be used. When two (2) hardnesses of rubber are included in a gasket, the soft and hard portions shall be integrally molded and joined in a strong vulcanized bond. They shall be free of porous areas, foreign material, and visible defects. The required properties of the gasket rubber and the required method of test are given in the following table:

Property	**ASTM Test Method**	**Main Body of Gasket**	**Harder Portion (if used)**
Hardness, Durometer "A"	D676 at 76±	45-70	78-90
Minimum Ultimate Tensile (psi)	D412	2000	1200
Minimum Ultimate Elongation (%)	D412	300	125
Minimum Aging (%)*	D572***	60	60

*Of original length
**Of original values of tensile and ultimate elongation.
***Oxygen pressure method: After 96 hours at 70±1°C at 300+10 psi.

E. The gasket manufacturer shall set up such quality control procedures as will insure the gasket's meeting the requirements of this standard. He shall furnish a monthly report of representative quality control test results to the pipe manufacturer.

F. A sample push-on fitting shall be submitted to the Engineer for examination and approval prior to delivery of any pipe.

2.5 DETECTOR WIRE

A. A continuous single strand solid copper #12 AWG detector wire shall be placed approximately 6" over all PVC pipe. Provide a continuous loop to ground level in all valve boxes and at all hydrants.

PART 3 - EXECUTION

3.1 LAYING PIPE

A. All provisions with respect to trenching, backfilling, bedding, and pipe laying shall conform to the applicable requirements of the sections entitled “Earthwork” and “Ductile Iron Piping and Ductile Iron and Cast Iron Fittings” of these Specifications.

B. All provisions with respect to connections and existing utilities shall comply with the applicable requirements of the section entitled “Ductile Iron Piping and Ductile Iron and Cast Iron Fittings” of these Specifications.

C. When a joint consists of a PVC flange and a metal flange, the metal flange shall be flat faced and furnished with a full face resilient gasket.

D. Valves shall be installed with the flow arrow in the proper direction.

E. Service line taps into PVC pipe shall be made using tapping saddle constructed for use on PVC pipe. The saddle shall be constructed of bronze or brass, shall have all stainless steel bolts or screws, and have a resilient rubber gasket to provide a positive, watertight seal.

F. PVC pipe laid underground shall have a minimum of 48 inches of cover in traffic areas and 30 inches of cover in non-traffic areas.

G. A 3-inch wide detector tape shall be buried 12 inches above the top of the pipe continuously along the entire length of pipe.

3.2 SEPARATION AND PROTECTION

A. All existing sewers, water lines, gas lines, underground conduits, telephone lines, sidewalks, curbs, gutters, pavements, electric lines, or other utilities or structures in the vicinity of the work shall be carefully protected by the Contractor from damage at all times. Where it is necessary for the proper accomplishment of the work to repair, remove and/or replace any such utility, the work shall be done under the provisions set forth in the “General Conditions.” No separate payment shall be made for removing and replacing and/or repairing damaged existing sewers; water, gas, electric, telephone lines or conduits; or other utilities, culverts, drains, or conduits of similar existing services or structures. Similar repair and replacement of sidewalks, curbs, gutters, and pavements are provided elsewhere in these Specifications.

B. Sewers and force mains shall be laid to provide at least 6 feet of horizontal separation from any existing or proposed water main or to provide at least 3 feet of horizontal separation from any existing or proposed reclaimed water main. Reclaimed water mains shall be laid to provide at

least 3 feet of horizontal separation from any proposed or existing water main or sewer line. If conditions prevent the above separation, the sewer may be constructed closer to a water main or reclaimed water main if it is laid in a separate trench and if the elevation of the invert of the water main is at least 18 inches above the top of the sewer, force main or reclaimed water main.

C. When sewers cross under water or reclaimed water mains, the top of the sewer shall be at least 18 inches below the bottom of the water or reclaimed water main. If conditions prevent the above separation with joints staggered, one full length of ductile iron water or reclaimed water main shall be centered over the sewer so that both joints will be at least 6 feet from the sewer.

D. When it is impossible to obtain proper horizontal and vertical separation as stipulated above, both water main and sewer shall be constructed of mechanical-joint cast iron pipe and shall be pressure tested to assure water tightness.

E. When sewer lines cross under culverts where the sewer and the culvert are less than 18 inches apart, the sewer line shall be encased in concrete or shall be constructed of ductile iron if shown on the drawings.

3.3 THRUST RESTRAINT

A. All piping, valves, and hydrants shall be securely anchored and restrained against movement at the specified test pressure in accordance with Section entitled “DUCTILE IRON PIPE AND DUCTILE IRON AND CAST IRON FITTINGS” of these specifications.

3.4 FIELD TESTING

A. After all piping has been placed and backfilled between the joints, each run of newly laid pipe, or any valved section thereof, shall be tested by the Contractor in the presence of the Engineer, and tests shall be continued until all leaks have been made tight to the satisfaction of the Engineer.

B. All piping shall be subject to hydrostatic gauge pressure equal to the rated pressure class of the pipe being tested and the leakage determined. No pipe installation shall be accepted until the leakage is less than 10 U.S. gallons per 24 hours per mile of pipe per inch nominal pipe diameter. All visible leaks are to be repaired regardless of quantity. Where the joints and fittings are exposed, the duration of the test shall be a minimum of 2 consecutive hours or until all joints and fittings are inspected for leakage, whichever is greater. The duration for backfilled or partially backfilled pipelines, where the joints and fittings are not exposed, shall be at least 6 consecutive hours.

C. The Contractor shall take all precautions necessary to protect any equipment that might be damaged by the pressures used in the tests. Delicate equipment shall be valved off, removed, or otherwise protected.

D. All piping shall be securely anchored and restrained against movement prior to application of test pressures. Prior to the pressure test, pipe laid in trenches shall be partially backfilled adequately to secure the pipe during the test. All joints, fittings, and valves will be left exposed. All exposed pipe, fittings, valves, and joints shall be carefully examined during the pressure test.

E. Before applying the specified test pressure, all air shall be expelled from the pipe. If hydrants, blow-offs, or air release valves are not available at the high places, the Contractor shall make the necessary taps at points of highest elevation before the test is made and insert plugs after the test has been completed.

F. Any excessive leakage revealed during the test shall be corrected at the Contractor's expense. If the defective portion cannot be located, the Contractor, at his expense, shall remove and reconstruct as much of the original work as necessary to obtain a facility meeting the specified leakage limits.

G. After all tests on any section have been completed to the satisfaction of the Engineer, the Contractor shall carefully clean, blow out, and drain the line of all water to prevent the freezing of the same. The Contractor shall also demonstrate to the satisfaction of the Engineer that any and all lines are free from obstructions and foreign material.

H. The Contractor shall bear the complete cost of the tests, including set-up, labor, temporary piping, blocking, gauges, bulkheads, water, air, soap solutions, and any other materials required to conduct the tests.

3.5 DISINFECTION

A. After installation and testing, all potable water piping shall be disinfected in accordance with the requirements of AWWA C651.

3.6 CHLORINATION OF COMPLETED WATER LINE

A. Before placing into service all new water distribution systems, or extensions to existing systems, or any valved section of such extension or any replacement in the existing water distribution system shall be chlorinated.

B. Any of the following methods of procedure shall be followed, subject to the approval of the Engineer.
1. Liquid Chlorine gas-water mixture
2. Direct Chlorine feed
3. Calcium Hypochlorite and water mixture

C. Preliminary Flushing: Prior to chlorination, all dirt and foreign matter shall be removed by a thorough flushing through the hydrants, or by other approved means. Each valved section of newly laid pipe shall be flushed independently. This shall be done after the pressure test is completed. All water mains shall be flushed at a velocity greater than or equal to 3.0 feet per second.

D. Liquid Chlorine: A chlorine gas-water mixture shall be applied by means of a solution- fed chlorinating device, or if approved by the Engineer, the gas shall be fed directly from a chlorine cylinder equipped with a proper device for regulating the rate of flow and effective diffusion of gas within the pipe. (Chlorination with the gas-waster mixture is preferred to direct feed).

E. Point of Application: The preferable point of application of the chlorination agent shall at the beginning of the pipe line extension, or any valved section of it, and through a corporation stop

inserted in the horizontal axis of the newly laid pipe. The water injector for delivering the gas-water mixture into the pipe shall be supplied from a tap on the pressure side of the gate valve controlling the flow into the pipe line extension. In a new system, application may be at the pumping station, or the elevated tank, or the standpipe, or reservoir if available. If a supply of water is not available, the Contractor shall haul the water by tank or other approved means. All water used for testing of chlorinating shall be approved by the Engineer. No additional payment will be made to the Contractor for hauling water.

F. Rate of Application: Water from the existing distribution system or other source of supply shall be controlled to flow very slowly into the newly laid pipe line during the application of chlorine. The rate of chlorine gas-water mixture flow shall be in such proportions to the rate of water entering the pipe that the chlorine dose applied to the water entering the newly laid pipe shall exceed 50 PPM.

G. Back Pressure Prevented: Back pressure, causing a reversal of flow in the pipe being treated, shall be prevented.

H. Retention Period: Treated water shall be retained in the pipe long enough to destroy all non-spore-forming bacterial. This period shall be at least 24 hours and preferably longer as may be directed. After the chlorine treated water has been retained for the required time, the chlorine residual at pipe extremities and at other representative points shall be at least 25 PPM.

I. Chlorination Valves and Hydrants: In the process of chlorinating newly laid water pipe, all valves or other appurtenances shall be operated while the pipeline is filled with the chlorinating agent.

J. Final Flushing and Test: Following chlorination, all treated water shall be thoroughly flushed from the newly laid pipe line at its extremities until the replacement water throughout its length shall, upon test, both chemically and bacteriologically, be proved to have zero coliform growth and approved by the Public Health Authority having jurisdiction. Certified test reports of chemical and bacteriological analysis shall be provided to the Engineer and proper authorities of the Owner.

K. Repetition of Procedure: Should the initial treatment, in the opinion of the Engineer, prove ineffective, the chlorination procedure shall be repeated until confirmed test show that water sampled from the newly laid pipe conforms to the requirements of CHLORINATION OF COMPLETED PIPE LINE, (I).

L. Alternate Chlorination:
1. Calcium Hypochlorite: On approval of the Engineer, a mixture of calcium hypochlorite ("HTH", "Perchloron", and "Mexochlor") of known chlorine content and water may be substituted as an alternative for liquid chlorine.
2. Proportions of Calcium Hypochlorite and Water Mixtures: A 5% of powder to 95% of water by weight.
3. Application: This calcium hypochlorite and water mixture, first made into a paste and then thinned to a slurry, shall be injected or pumped into the newly laid pipe under conditions heretofore specified for liquid chlorine application, after preliminary flushing.
4. Approval: Provisions for final flushing, testing, and approval under this alternative shall be the same as those described above.

M. Procedure When Cutting into Existing Pipe Lines: Unless the Engineer shall direct otherwise, cuts made in existing pipe lines for the insertion of valves, fittings, repairs, or for any other purpose shall be chlorinated by shaking a quantity of the powder, predetermined by the Engineer, into the pipe on each side of the cut-in. After slowly filling the section and reversing the flow, the chlorinated water shall be retained for several hours, then flushed until no odor of chlorine can be detected in the waste water, or preferable until a check shall have been made for residual chlorine as provided for herein.

N. Resumption of Service: After satisfactory chlorination by any of these alternative procedures, the consumers may be served from the newly laid pipe line or the services may be resumed on existing pipe lines upon obtaining approval from State Health Department.

3.7 DECHLORINATION

A. Prior to discharging chlorinated water from the disinfected water line, all water shall be de-chlorinated so that the total chlorine residual is less than 0.1 mg/l.

END OF SECTION 33 05 50

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SECTION 33 05 51 - DUCTILE IRON PIPING & DUCTILE IRON & CAST IRON FITTINGS

PART 1 - GENERAL

1.1 SCOPE

A. The work covered by this section includes furnishing all labor, equipment, and materials required to furnish, install, and test ductile iron piping, including all fittings, wall pipe and sleeves, couplings, toppings, anchor blocks, and accessories, as specified herein and/or shown on the Drawings.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 33 05 50 - Polyvinyl Chloride Pressure Pipe

B. Section 33 31 13.01 - Polyvinyl Chloride Sewer Pipe and Service Pipe

C. Section 33 31 13.03 - Vitrified Clay Pipe Sewers

1.3 QUALITY ASSURANCE

A. The Contractor shall submit to the Engineer written evidence that the pipe furnished under this specification is in conformance with the material and mechanical requirements specified herein. Certified copies of independent laboratory test results or mill test results from the pipe supplier may be considered evidence of compliance provided such tests are performed in accordance with the appropriate ASTM or AWWA testing standards by experienced, competent personnel. In case of doubt as to the accuracy or adequacy of mill tests, the Engineer may require that the Contractor furnish test reports from an independent testing laboratory on samples of pipe materials.

B. Each ductile iron pipe length and fitting and cast iron fitting shall be clearly marked with the pressure rating, metal thickness class, heat mark, net weight (excluding lining or coating) and name of manufacturer. In addition, each item of piping shall be marked with an identifying mark corresponding to the appropriate mark on the shop drawings for that particular item of piping.

1.4 SHOP DRAWINGS AND ENGINEERING DATA

A. Complete shop drawings and engineering data on all piping and accessories shall be submitted to the Engineer in accordance with the requirements of the section entitled "Submittals" of these Specifications.

1.5 STORAGE AND PROTECTION

A. All pipe and fitting shall be stored under cover.

B. All pipe and accessories shall be stored aboveground and fully supported so as not to bend or deflect excessively under its own weight. Height of stacked pipe shall not exceed 4 feet. Bundled pipe shall not be stacked more than two (2) bundles high.

C. Kinked, flattened, buckled, broken, or otherwise defective pipe and fittings shall not be used and shall be removed from the site.

PART 2 - PRODUCTS

2.1 GENERAL

A. All pipe shall be manufactured in the United States. All pipe and fittings shall be either new or refurbished by the original manufacturer who shall certify them equivalent to new.

B. No broken, cracked, deformed, misshapened, imperfectly coated, or otherwise damaged or defective pipe or fittings shall be used. All such material shall be removed from the site of the work.

C. Unless otherwise shown on the Drawings or directed by the Engineer, the minimum pipe wall thickness and thickness class of pipe shall be as follows:

	Metal Wall	
Pipe Size (in.)	**Pressure Class**	**Thickness (in.)**
4	350	0.25
6	350	0.25
8	350	0.25
10	350	0.26
12	350	0.28
16	250	0.30
18	250	0.31
20	250	0.33
24	200	0.33
30	150	0.34

2.2 DUCTILE IRON PIPE

A. Ductile iron pipe shall be designed in accordance with ANSI A21.50, Thickness Design of Ductile Iron Pipe, using 60,000 psi tensile strength, 42,000 psi yield strength, and 10 percent elongation.

B. Ductile iron pipe shall be manufactured in accordance with ANSI A21.51, Ductile Iron Pipe Centrifugally Cast in Metal Molds or Sand-Lined Molds for Water or Other Liquids, and shall be made of ductile iron having a minimum tensile strength of 60,000 psi, a minimum yield strength of 42,000 psi and 10 percent minimum elongation.

2.3 CAST IRON AND DUCTILE IRON FITTINGS

A. All fittings 2 inch through 48 inch shall conform in every respect to ANSI A21.10 or A21.53 or AWWA C153 or C110.

B. Unless otherwise shown on the Drawings, directed or specified, all fittings shall be for pressure rating of 250 psi.

C. In general, fittings shall be any ANSI pattern. Long radius elbows shall be used where shown on the drawings. Special fittings and cast iron and ductile iron wall pipes and sleeves shall conform to the dimensions and details shown on the Drawings.

2.4 JOINTS FOR DUCTILE IRON PIPE AND FITTINGS AND CAST IRON FITTINGS

A. General
1. Joints for ductile iron pipe and fittings and cast iron fittings shall be mechanical joints, flanged joints, or push-on joints, as shown on the Drawings or specified herein.
2. Unless otherwise shown on the Drawings, specified or directed, all ductile iron pipe laid underground shall be joined using mechanical joints or push-on type joints.

B. Mechanical Joints
1. Mechanical joints shall consist of a bolt joint of the stuffing box type as detailed in ANSI A21.10 and described in ANSI A21.11.
2. Mechanical joints shall be thoroughly bolted in accordance with the manufacturer's recommendations with Tee Head Bolts and bolts of high strength, heat treated cast iron containing 0.50 copper or high strength low-alloy steel having a minimum yield point strength of 40,000 pounds per square inch and an ultimate tensile strength of 70,000 pounds per square inch.
3. Gaskets and bolts and nuts shall conform to ANSI A21.11. Gaskets shall be of neoprene or rubber of such quality that they will not be damaged by the liquid or gases with which they will come into contact.
4. Glands shall be of high strength cast iron.

C. Flanged Joints
1. Flanged joints shall conform to ANSI B 16.1, Class 125, and in accordance with Table 10.23 of ANSI A21.10.
2. Flanged joints shall be bolted with through stud or tap bolts of required size as directed. Bolts and nuts shall conform in dimensions to the American Standard heavy series. Nuts shall be hexagonal, cold pressed. Bolts and nuts shall be cadmium plated, cold pressed, steel machine bolts, conforming to ASTM A 307, Grade B. Cadmium plating shall be by an approved process and shall be between 0.003- to 0.0005-inch thick. After each joint has been made, all bolts, heads, and nuts shall be coated with two coats of heavy asphaltum or other approved coating.
3. Gaskets of "Cranite," red rubber, asbestos composition, or other approved quality shall be used in all flanged joints. Gaskets shall conform to the requirements of ANSI B16.21.
4. Flanged ductile iron pipe approximately 12 inches or less in length shall have flanges cast solidly to the pipe barrel. Flanges on ductile iron pipe longer than 12 inches may be of the screw type. Pipe threads shall be of such length that the flanges screwed home, the end of the pipe shall project beyond the face line of the flange. Flange and pipe shall then be machined to give a flush finish to the pipe and the flange and surface shall be

normal to the axis of the pipe. Ductile iron flanges shall be of such design that the flange neck completely covers the threaded portion of the pipe to protect same against corrosion. Flange faces on cast iron fittings shall be coated with white lead immediately after they have been faced and drilled. All pipe with screw type flanges shall be assembled, faced, and drilled at the point of manufacture, unless otherwise approved by the Engineer.

5. Where tap or stud bolts are required, flanges shall be drilled and tapped accordingly.

D. Push-On Joints

1. Push-on joints shall conform to ANSI 21.10 and ANSI 21.11 or AWWA C110 and AWWA C111. Push-On fittings shall conform to ANSI 21.10 or ANSI 21.53 or AWWA C110 or AWWA C153. Details of the joint design shall be in accordance with the manufacturer's standard practice such as "Fastite," "Bell-Tite," or "Tyton" joints.
2. Gaskets shall be in accordance with ANSI A21.11 and shall be of such quality that they will not be damaged by the liquid or gases with which they will come into contact.

2.5 COATING AND LINING

A. Lining for Wastewater: Interior of pipe and fittings to be lined with factory applied ceramic epoxy (Ceramapure PL 90, Perma-Shield PL Series 431, Permox-CTF, or approved equal), 40 mils thickness.

1. All internal surfaces of ductile iron pipe and fittings shall be delivered to the application facility without asphalt or any other protective lining on the interior surface. All oils, small deposits of asphalt paint, grease, and soluble deposits shall be removed in accordance with NAPF 500-03-01 Solvent Cleaning prior to abrasive blasting.
2. Pipe: Uniformly rotary-abrasive blast using angular abrasive to a NAPF 500-03-04: Internal Pipe Surface condition, full removal of annealing oxide layer. When viewed through magnification, the interior surfaces shall be free of all visible dirt, dust, annealing oxide, rust, mold coating, and other foreign matter. Any area where rust appears before application shall be reblasted. The surface shall contain a minimum angular anchor profile of 3.0 mils (reference NACE RP0287 or ASTM D 4417, Method C).
3. Fittings: Uniformly abrasive blast using angular abrasive to a NAPF 500-03-05: Fitting Blast Clean #1 condition, no staining. When viewed without magnification, the interior surfaces shall be free of all visible dirt, dust, annealing oxide, rust, mold coating, and other foreign matter. Any are where rust appears before application shall be reblasted. The surface shall contain a minimum angular anchor profile of 3.0 mils (reference RP0287 or ASTM D 4417, Method C.
4. All surfaces must be clean, dry, and free of oil, grease, and other contaminants.
5. Contractor shall have available on-site enough field touch-up and coating repair kits to coat pipes that are cut or otherwise damaged. Coating using field repair kits shall be installed per manufacturer’s written instructions.
6. The interior lining of all pipe and fittings shall be tested for pinholes with a non-destructive, 2500 volt test. Any defects shall be repaired prior to shipment.

B. Lining for Water: Interior of pipe and fittings to receive a cement mortar lining of standard thickness in accordance with ANSI A21.4.

C. Coating: Coat exterior of pipe and fittings to be buried with an asphaltic material approximately 1 mil thick in accordance with AWWA C151/ANSI A21.51, AWWA C110/ANSIA 21.10, and AWWA C153/ANSI A 21.53. Coat exterior of all exposed ductile iron pipe and fittings with a primer as specified in paragraph 3.6.

D. Color Identification: Pipe shall have four (4) each, 2-inch wide stripes painted at 90-degree angles around the pipe exterior. Color of stripes shall be blue for water and green for sewer.

2.6 PIPE COUPLINGS

A. Pipe couplings shall be installed where shown on the Drawings, required for installation, or directed by the Engineer.

2.7 WALL PIPE AND WALL SLEEVES

A. Contractor shall furnish and install cast iron wall pipe or wall sleeves where ductile iron piping connects with or passes through concrete walls or floors and in locations where small piping and electric wiring and conduits connect with or pass through concrete walls or floors.

B. Where wall pipes or sleeves are to be installed flush with the wall or slab, the flange or bell shall be tapped for studs. Where the flange or bell will project beyond the wall, the projection shall be sufficient to allow for installation of connecting bolts.

PART 3 - EXECUTION

3.1 LAYING

A. Proper and suitable tools and appliances for safe and convenient handling and laying of pipe and fittings shall be used. Great care shall be taken to prevent the pipe coating from being damaged, particularly cement linings on the inside of the pipes and fittings. Any damage shall be remedied as directed by the Engineer.

B. All pipe and fittings shall be carefully examined by the Contractor for defects just before laying and no pipe or fitting shall be laid which is defective. If any defective pipe or fitting is discovered after having been laid, it shall be removed and replaced in a satisfactory manner with a sound pipe or fitting by the Contractor at his own expense.

C. All pipes and fittings shall be thoroughly cleaned before they are laid and shall be kept clean until they are used in the completed work. Open ends of pipe shall be kept plugged with a bulkhead during construction.

D. Pipe laid in trenches shall be laid true to line and grade on a firm and even bearing for its full length at depths and grades as shown on the Drawings. Adequate precautions shall be taken to prevent floatation of pipelines prior to backfilling. Installation of ductile iron pipe in underground pressure piping systems shall conform to the requirements of AWWA C600. Excavation of trenches and backfilling around pipes shall conform to the requirements of the section entitled "Earthwork" of these Specifications.

E. All bends, tees, branches, crosses, plugs, caps, fire hydrants, and reducers in pressure piping systems shall be adequately restrained against thrust. Underground pressure piping containing unharnessed push-on or mechanical joints or expansion joints shall be restrained by thrust blocks. Thrust blocks shall consist of concrete having a minimum 28-day compressive strength

of 2,500 psi and shall be of the size and shape as shown on the Drawings. The Contractor may use forms or earth walls to mold the thrust blocks. When earth walls are used, they shall be cut true to shape and all excess earth removed. The work shall be conducted so that no loose earth will become mixed with the concrete. At the end of 24 hours, damp earth may be placed over the concrete to retain moisture.

F. Wall pipe and wall sleeves shall be accurately located and securely fastened in place before concrete is poured. All wall pipe and wall sleeves shall have wall collars properly located to be in the center of the wall where the respective pipes are to be installed.

G. Wall pipe and wall sleeves shall be installed when the wall or slab is constructed. Blocking out or breaking of the wall for later insertion shall not be permitted.

H. Cutting or weakening of structural members to facilitate pipe installation shall not be permitted. All piping shall be installed in place without springing or forcing.

I. Sufficient couplings and flanged joints shall be provided to facilitate equipment installation and removal.

J. Exposed ductile iron piping shall be supported as shown on the Drawings and specified in the section entitled "Pipe Supports and Hanger" of these Specifications.

3.2 CUTTING

A. Whenever pipe requires cutting to fit the lines, the work shall be done in such manner as to leave a smooth end at right angles to the axis of the pipe. When a piece of pipe is cut to fit into the line, no payment will be made for the portion cut off and not used.

B. Whenever existing pipe requires cutting to install new fittings, the work shall be done in such manner as to leave a smooth end at right angles to the axis of the pipe and special care shall be exercised to guard against breaking or splitting the existing piping.

C. All cutting of ductile iron pipe shall be done with a cutting saw. All burrs shall be removed from the inside and outside edges of all cut pipe.

3.3 JOINING

A. Mechanical Joints
   1. The successful operation of the mechanical joint specified requires that the spigot be centrally located in the bell and that adequate anchorage shall be provided where abrupt changes in direction and dead ends occur.
   2. The surfaces with which the rubber gasket comes in contact shall be brushed thoroughly with a wire brush just prior to assembly to remove all loose rust or foreign material which may be present and to provide clean surfaces which shall be brushed with a liberal amount of soapy water or other approved lubricant just prior to slipping the gasket over the spigot end and into the bell. Lubricant shall be brushed over the gasket prior to installation to remove loose dirt and lubricate the gasket as it is forced into its retaining space.

3. Joint bolts shall be tightened by the use of approved wrenches and to a tension recommended by the pipe manufacturer. When tightening bolts, it is essential that the gland be brought up toward the pipe flange evenly, maintaining approximately the same distance between the gland and the face of the flange at all points around the socket. This may be done by partially tightening the bottom bolt first, then the top bolt, next the bolts at either side and last, the remaining bolts. This cycle shall be repeated until all bolts re within the range of acceptable torques. If effective sealing is not attained at the maximum torque indicated above, the joint shall be disassembled and reassembled after thorough cleaning. Overstressing of bolts to compensate for poor installation shall not be permitted.
4. After installation, bolts and nuts in buried or submerged piping shall be given two (2) heavy coats of a bituminous paint.

B. Flanged Joints
1. All flanges shall be true and perpendicular to the axis of the pipe. Flanges shall be cleaned of all burrs, deformations, or other imperfections before joining. Flanged joints shall be installed so as to ensure uniform gasket compression. All bolting shall be pulled up to the specified torque by crossover sequence. Where screwed flanges are used, the finished pipe edge shall not extend beyond the face of the flange, and the flange neck shall completely cover the threaded portion of the pipe.
2. Connections to equipment shall be made in such a way that no strain is placed on the equipment flanges. Connecting flanges must be in proper position and alignment and no external force may be used to bring them together properly.
3. After installation, bolts and nuts in buried or submerged piping shall be given two (2) heavy coats of a bituminous paint.

C. Push-On Joints
1. The inside of the bell and the outside of the pipe from the plain end to the guide stripe must be wiped clean immediately before assembling the pipe joint. Then the rubber gasket shall be inserted into a groove or shaped recess in the bell. Both the bell and spigot ends to be jointed shall be wiped again to ensure they are thoroughly clean. A liberal coating of special lubricant furnished by the pipe manufacturer shall be applied to the outside of the pipe from the plain end to the yellow guide stripe and to the inside of the gasket. The plain end shall be centered in the bell and the spigot pushed home. Wherever possible the pipe shall be socketed by hand; however, jacking may be required to push the spigot in place on the larger sizes of pipe. The completed joint shall be permanently sealed and watertight.
2. Whenever the pipe is cut in the field, the cut end shall be conditioned so it can be used in making up a joint by filing or grinding the cut end to remove burrs or sharp edges that might damage the gasket.

D. Permissible Deflection of Joints
1. Deflection of ductile iron pipe at joints for long radius curves or for avoiding obstacles shall be permitted only upon approval of the Engineer.
2. Where deflection of joints is permitted, such deflection shall be made in accordance with and shall not exceed limits provided in Section 9b.5 and Section 9c.4 as applicable, of the AWWA C600.

E. Joints of Dissimilar Metals

1. When a flanged joint consists of a ductile iron flange mated to a steel or alloy flange, the steel flanges shall be flat faced and furnished with full-faced gaskets, insulating bushings, and stainless steel bolts.

3.4 THRUST RESTRAINT

A. General: Plugs, caps, tees bends deflecting 11¼° or more, and fire hydrants shall be provided with thrust blocking and/or retainer glands or metal tie rods as directed. Valves shall be security anchored or provided with thrust blocking to prevent movement.

B. Concrete Thrust Blocks: Concrete having a minimum 28 day strength of 2,500 psi shall be placed between the fitting and undisturbed ground. The thrust and bearing sides of the blocks shall be poured directly against the fitting and undisturbed earth. The sides of the blocking not subject to thrust may be poured against form. Blocking shall be placed so that the fitting will be accessible for repair. The minimum area of bearing shall be as shown however actual area of bearing shall be increased to provide sufficient bearing area when low strength soils are encountered.

C. Retainer Gland: Retainer glands shall be used on ductile iron pipe only and be designed and manufactured in accordance with DIPRA-01. The gland shall be rated for 350 psig by Underwriters Laboratories. Restraining shall be accomplished by wedge acting lugs tightened by bolts with break-away heads to provide uniform pressure.

D. Metal Tie Rods: Tie rod joints shall consist of threaded tie rods connected to joints with eye bolts or lugs or lugged fittings. All rods, eyebolts, couplings and nuts shall be ¾-inch high strength ASTM A242-81 (CorTen) corrosion resistant steel. The minimum number of rods used on 4 inch and 6 inch joints shall be two (2), three (3) rods for 8 inch pipe, four (4) for 10 inch pipe and six (6) rods for 12 inch pipes.

E. Megalug Joint Restraint: Mechanical joint restraint shall include a restraining mechanism which, when actuated, imparts multiple wedging action against the pipe, increasing its resistance as the pressure increases. Flexibility of the joint shall be maintained after burial. Gland body, wedges, and wedge actuating components shall be manufactured of ductile iron conforming to ASTM A536-84. Restraining devices shall be of ductile iron heat treated to a minimum hardness of 370 BHN. Dimensions of the gland shall be such that it can be used with the standardized mechanical joint bell and tee-head bolts conforming to ANSI/AWWA C111/A21.11 and ANSI/AWWA C153/A21.53 of latest revision. Twist-off nuts shall be used to insure proper actuating of the restraining devices.
   1. The mechanical joint restraint device shall have a working pressure of at least 250 psi with a minimum of safety factor of 2:1 and shall be EBAA Iron, Inc. MEGALUG or equal.

3.5 FIELD TESTING

A. After all piping has been placed and backfilled between the joints, each run of newly laid pipe, or any valved section thereof, shall be tested by the Contractor in the presence of the Engineer, and tests shall be continued until all leaks have been made tight to the satisfaction of the Engineer.

B. Inspection and testing of ductile iron pipe and all fittings used for pressure applications shall be carried out in accordance with procedures established in Section 33 05 50 of these specifications.

C. Inspection and testing of ductile iron pipe and all fittings used for gravity sewer shall be carried out in accordance with procedures established in Section 33 31 13.01 or 33 31 13.03 of these Specifications.

3.6 FIELD PAINTING

A. After installation and testing, all exposed piping shall be field primed and painted in accordance with the requirements of the section entitled "General Materials Stipulations" of these Specifications.

END OF SECTION 33 05 51

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SECTION 33 05 53 - PIPE AND FITTINGS

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section contains information required to furnish and install piping and related components as shown on the drawings and specified in these specifications.

B. Related Work Elsewhere:
   1. Section 31 22 00: Site Grading (Compaction)
   2. Section 40 05 51: Valves

1.2 SUBMITTALS

A. Submit shop drawings showing all proposed piping including class or schedule of pipe, pipe dimensions, wall pipes and other pertinent information in accordance with Section 0l 33 00. Submit pressure test schedule as required in the specifications at least 14 days prior to beginning of testing.

PART 2 - PRODUCTS

2.1 POLYVINYL CHLORIDE (PVC) PIPE

A. Pressure Rated PVC Pipe shall be Class 160 meeting requirements of ASTM D-2241 and ASTM D-l784. All pipe must meet requirements of PS 22-70, with standard dimension ratio SDR 26, and bearing the National Sanitation Foundation Seal for potable water pipe. Pipe shall be made from clean, virgin materials.

B. Scheduled Rated PVC Pipe shall be Schedule 40 or Schedule 80 as shown on the drawings meeting requirements of ASTM D 1785. Pipe shall bear the National Sanitation Foundation seal for potable water pipe. Pipe shall be made from clean virgin materials.

C. Joints for PVC pipe shall be one of the following types:
   1. Integral bell gasketed joints and couplings meeting requirements of ASTM D-3l39 shall be used on all pressure rated PVC pipe.
   2. Solvent cement couplings meeting requirements of ASTM D-3036 or solvent cement threaded joints with NPT threads shall be used on all schedule rated PVC pipe.

D. Fittings for PVC pressure rated pipe 3 inches and smaller shall be PVC and furnished in accordance with ASTM D-2467. Fittings for PVC Schedule Pipe shall be in accordance with ASTM Dl785. Fittings for PVC Pressure Rated Pipe larger than 3 inches shall be cast iron and be furnished in accordance with ASTM.

E. Detector Tape: Unless specified separately, 3 inch metallic locator tape shall be placed over all PVC pipe.

F. Color Identification: Pipe used for water shall be blue or white. Pipe used for sewer shall be green.

2.2 DUCTILE IRON PIPE (DIP) AND FITTINGS

A. All ductile iron pipe shall be designed in accordance with ANSI Specification A21.5l (AWWA Cl5l). The pressure rating, metal thickness class, net weight of pipe, length of pipe and name of manufacturer shall be clearly marked on each length of pipe. All ductile iron pipe shall be cement mortar lined.

B. All buried pipe shall be mechanical joint or approved push-joint type. All joints and fittings shall meet the specifications of ANSI 21.10 and ANSI 21.11 (AWWA C110 and AWWA C111). Mechanical joints shall have nuts and bolts of alloy steel (Corten type such as U.S. Alloy or approved equal). Gaskets shall be made of plain rubber with 70-75 durameter. For buried pipe with 30 inches or more cover, metal thickness shall be governed by ANSI Specification A21.51, Table 51.1. Metal thickness of pipe with less than 30 inches cover shall be governed by interpolating the table below. Unless directed by the Engineer, all buried pipe shall be designed for trench Condition 1.

C. All exposed pipe shall be flanged pipe and shall be minimum Class 53.

D. At Contractor's option, grooved-end joints conforming to AWWA C606 for rigid radius cut grooves, couplings and fittings may be substituted in lieu of flanges for line sizes 36 inches and smaller. Grooved fittings shall conform to ANSI/AWWA C110, AWWA/ ANSI C606 and ANSI B16.1 as manufactured by the Victaulic Company of America. Couplings shall be ductile iron, ASTM A536, Victaulic style #31.

E. All pipe to be used with Dresser type couplings shall be furnished with plain ends in accordance with AWWA Specifications on tolerances.

F. Lining for Wastewater: Interior of pipe and fittings to be lined with factory applied ceramic epoxy (Ceramapure PL 90, Perma-Shield PL Series 431, Permox-CTF, or approved equal), 40 mils thickness.
   1. All internal surfaces of ductile iron pipe and fittings shall be delivered to the application facility without asphalt or any other protective lining on the interior surface. All oils, small deposits of asphalt paint, grease, and soluble deposits shall be removed in accordance with NAPF 500-03-01 Solvent Cleaning prior to abrasive blasting.
   2. Pipe: Uniformly rotary-abrasive blast using angular abrasive to a NAPF 500-03-04: Internal Pipe Surface condition, full removal of annealing oxide layer. When viewed through magnification, the interior surfaces shall be free of all visible dirt, dust, annealing oxide, rust, mold coating, and other foreign matter. Any area where rust appears before application shall be reblasted. The surface shall contain a minimum angular anchor profile of 3.0 mils (reference NACE RP0287 or ASTM D 4417, Method C).
   3. Fittings: Uniformly abrasive blast using angular abrasive to a NAPF 500-03-05: Fitting Blast Clean #1 condition, no staining. When viewed without magnification, the interior surfaces shall be free of all visible dirt, dust, annealing oxide, rust, mold coating, and other foreign matter. Any are where rust appears before application shall be reblasted.

The surface shall contain a minimum angular anchor profile of 3.0 mils (reference RP0287 or ASTM D 4417, Method C.

4. All surfaces must be clean, dry, and free of oil, grease, and other contaminants.
5. Contractor shall have available on-site enough field touch-up and coating repair kits to coat pipes that are cut or otherwise damaged. Coating using field repair kits shall be installed per manufacturer's written instructions.
6. The interior lining of all pipe and fittings shall be tested for pinholes with a non-destructive, 2500 volt test. Any defects shall be repaired prior to shipment.

G. Lining for Water: Interior of pipe and fittings to receive a cement mortar lining of standard thickness in accordance with ANSI A21.4.

H. Coating: Coat exterior of pipe and fittings to be buried with an asphaltic material approximately 1 mil thick in accordance with AWWA C151/ANSI A21.51, AWWA C110/ANSIA 21.10, and AWWA C153/ANSI A 21.53. Coat exterior of all exposed ductile iron pipe and fittings with a universal primer compatible with the specified top coat.

I. Color Identification: Pipe shall have four (4) each, 2-inch wide stripes painted at 90-degree angles around the pipe exterior. Color of stripes shall be blue for water and green for sewer.

REQUIRED PIPE THICKNESS (IN.)

Nominal Pipe Diameter (in.)	Depth Cover (ft.)	Typical Laying Condition				
		1	2	3	4	5
8	0.5	0.37	0.36	0.34	0.31	0.28
	1	0.32	0.30	0.29	0.26	0.19
	1.5	0.28				
	2	0.26				
16	0.5	0.51	0.48	0.46	0.40	0.27
	1	0.46	0.43	0.40	0.33	
	1.5	0.41	0.38	0.34	0.27	
	2	0.37	0.34	0.30		
30	0.5	0.65	0.59	0.53	0.45	0.33
	1	0.62	0.56	0.49	0.42	
	1.5	0.57	0.51	0.43	0.37	
	2	0.53	0.45	0.39		
42	0.5	0.73	0.63	0.55	0.47	0.30
	1	0.71	0.61	0.53		
	1.5	0.67	0.57	0.49		
	2	0.62	0.52	0.44		

2.3 GALVANIZED STEEL PIPE

A. Steel pipe shall be galvanized with screw joints, and shall conform to the requirements of ASTM Al20-76 and Federal Specifications WW-P-406, Type I, Class A.

B. At Contractor's option, joints may be installed using a galvanized mechanical pipe coupling of a bolted type, with a pressure-responsive gasket along with galvanized mechanical pipe fittings

and grooved end valves, as manufactured by the Victaulic Company of America. Grooved piping systems shall be installed and supported in accordance with the latest published manufacturer's specifications. Style #07 rigid couplings shall be installed on all horizontal pipe lines, except at equipment hook-ups where a minimum of three (3) flexible style #75 couplings may be used in lieu of flex connectors for vibration attenuation.

2.4 FIBERGLASS REINFORCED PLASTIC PIPE (FRP)

A. Fiberglass reinforced pipe shall be either contact molded or filament wound. Pipe shall be suitable for use at 150 psi at 73°F. with a 4:1 safety factor or at 140°F with a 2:1 safety factor. Joints and fittings shall be flanged with ASA 150 lb. schedule bolting.

2.5 VITRIFIED CLAY PIPE (VCP)

A. Clay pipe and fittings shall have applied pre-molded joint for jointing connections. The pipe and fittings shall be extra strength, bell and spigot, glazed or unglazed, and shall meet the requirements of ASTM Specification C700-75. Joints and gaskets shall conform to ASTM Specification C425-75.

2.6 REINFORCED CONCRETE PIPE (RCP)

A. Concrete pipe shall be Class III wall B and conform to the latest requirements of ASTM C-76 for reinforced concrete pipe, tested and approved.

B. Concrete pipe shall have O-ring rubber gaskets unless otherwise specified in the plans.

2.7 CORRUGATED METAL PIPE (CMP)

A. Corrugated metal pipe shall conform to the latest requirements of AASHTO M 36 for uncoated pipe and AASHTO M 190, Type A for bituminous coated pipe. Metal gauges unless otherwise indicated shall be in accordance with The Florida Department of Transportation; Standard Specifications for Road and Bridge Construction, Latest Edition or the Alabama Highway Department: Standard Specifications for Highways and Bridges, Latest Edition.

B. Joints where necessary shall be made with standard connecting bands and gaskets. Bands shall be installed in accordance with standard practices and uniformly tightened. Contractor shall keep foreign matter from between the connecting bands and the pipe. When bituminous coated pipe and bands are used Contractor shall recover any exposed metal with a bituminous patch before placing the backfill.

2.8 STEEL PIPE

A. Steel Pipe for Process Liquid or Air: Steel pipe shall be designed in accordance with AWWA Specification C200. The pressure rating, metal thickness, net weight of pipe and name of manufacturer shall be clearly marked on each length of pipe.

B. All pipe shall be coated with an approved coal tar epoxy coating system on exterior and interior in accordance with AWWA C210. Coating shall be applied in the factory and shall be touched-up in the field to provide a final continuous coating.

C. All sections of pipe shall be seamless and sections shall be furnished in lengths as long as practicable to minimize the number of field welds but shall in no case be less than 20 feet.

D. All steel pipe shall be designed for a working pressure of 1.5 times the maximum working pressure which can be experienced in the pipe section of any given time.

E. All pipe shall be furnished with butt ends suitable for field welding.

F. At Contractor's option, joints may be installed using a mechanical pipe coupling of a bolted type, with a pressure-responsive gasket along with mechanical pipe fittings and grooved end valves, as manufactured by the Victaulic Company of America. Grooved piping systems shall be installed and supported in accordance with the latest published manufacturer's specifications. Style #07 rigid couplings shall be installed on all horizontal pipe lines, except at equipment hook-ups where a minimum of three (3) flexible style #75 couplings may be used in lieu of flex connectors for vibration attenuation.

G. Steel Pipe for Natural Gas: Natural gas piping shall be Schedule 40 black steel with welded fittings and joints for pipe larger than 2 inches and with malleable screwed joints and fittings for pipe 2 inches and smaller. Pipe shall be mil wrapped and all joints and fittings shall be wrapped with "Tape-Coat-20" or equal pipe protective coating.

2.9 POROUS WELL CONCRETE DRAIN PIPE

A. Porous concrete drain pipe to be extra strength pipe as manufactured by Walker Poroswall Pipe Co., Little Ferry, N.J. from a mixture of Portland Cement, Water, ⅜ trap rock and sand.

B. The cross section of pipe to be circular inside and out. The tongue and groove joint to be formed of solid concrete extending into barrel for approximately one inch at each end. All joints to be of the interlocking tongue and groove type with the exterior of the groove in the same plane as the exterior of the barrel.

C. All porous concrete pipe to be thoroughly cured in modern steam curing rooms and stored until properly aged before shipping. The finished pipe to be straight, free from cracks, checks or other defects and reasonably uniform in color and texture.

D. Pipe physical properties to conform to the following table:

Inside Diameter (in.)	Laying Length Min. (ft.)	Weight per Foot Min. (lb.)	Wall Thickness Min. (in.)	3 Edge Bearing Min. Crushing Strength (lb/LF)	Infiltration Rate per Ft. Min.
4	2	22	1.25	2200	8
6	2.5	29	1.25	2300	12
8	2.5	46	1.50	2700	16
10	3	64	1.625	2900	17
12	3	84	2.00	3100	18
15	3	122	2.25	3750	23
18	3	180	2.50	3750	24

2.10 PERFORATED DRAIN PIPE

A. The underdrain pipe shall meet the requirements of Sections 943 and 948-2 of the Florida Department of Transportation Standard Specifications for Roads and Bridges, Latest Edition, or the Alabama Highway Department Standard Specifications for Highways and Bridges, Latest Edition.

2.11 EXPANSION JOINTS

A. Expansion joints shall be equal to Mercer Rubber Company's Invincible Expansion Joints. Joints shall be of the arch type with number of arches dependent on movement expected when installed as shown on drawings. They shall be constructed of multiple plies or woven fabric, impregnated with elastomer (as listed below) and reinforced with welded steel rings imbedded in the body. They shall have flanges integral with the body of fabric-reinforced rubber, with ANSI 125 pound drilling, and a Hypalon coating applied at the factory for protection from ozone and weathering. Each end flange shall be backed up with ⅜-inch thick galvanized steel retaining rings.

B. Filled arches shall be used. Arches shall be filled with a soft flexible elastomer vulcanized to the carcass underneath the inner tube (liner) to prevent contact with the fluid carried.

C. All expansion joints shall be properly anchored wherever installed in pressurized pipe (such as pump discharge pipe), wherever needed to prevent excessive elongation due to weight or where shown on Plans. Control units (restraining rods) shall be installed if adequate anchoring is not practical, in accordance with the manufacturer's standard installation instructions. Control units shall consist of two (2) control rods and four (4) gusset plates for joints up to 40 inch ID; 40 inches to 54 inches, three (3) rods and six (6) plates; 54 inches to 96 inches, four (4) or more rods and eight (8) or more plates. Rods and plates should be of steel, and rubber grommets used to isolate the rods from the plates. Straight or concentric or eccentric tapered joints shall be used as shown on the drawings.

2.12 FLEXIBLE COUPLINGS

A. The pipe coupling shall be of a gasketed, sleeve-type with diameter to properly fit the pipe. Each coupling shall consist of one steel middle ring, of thickness and length specified, two (2) steel followers, two (2) rubber-compounded wedge section gaskets and sufficient track-head steel bolts to properly compress the gaskets.

B. The middle ring and followers of the coupling shall be true circular sections free from irregularities, flat spots, or surface defects. They shall be formed from mill sections with the follower-ring section of such design as to provide confinement of the gasket. After welding, they shall be tested by cold expanding a minimum of 1% beyond the yield point.

C. The coupling bolts shall be of the elliptic-neck, track-head design with rolled threads. The manufacturer shall supply information as to the recommended torque to which the bolts shall be tightened. All bolt holes in the followers shall be oval for greater strength.

D. The gaskets of the coupling shall be composed of a crude or synthetic rubber base compounded with other products to produce a material which will not deteriorate from age, from heat, or exposure to air under normal storage conditions. It shall also posses the quality of resilience and ability to resist cold flow of the material so that the joint will remain sealed and tight indefinitely when subjected to shock, vibration, pulsation and temperature or other adjustments of the pipe line.

E. The couplings shall be equal to Dresser, Style 38, as manufactured by Dresser Manufacturing Division, Bradford, Penn.

2.13 WALL PIPES AND SLEEVES

A. All pipes passing through walls of tanks which contain liquid shall be by use of wall pipes unless otherwise shown on the plans. Wall pipes and sleeves shall be of the dimensions shown on the plans or approved shop drawings and shall be furnished with the type ends shown on the plans or approved shop drawings. Flanges shall be drilled to ANSI 125 pound template. All wall pipes and sleeves shall be furnished with an intermediate wall collar located such that it will be located in the center of the wall in which it is placed. All wall pipes and sleeves shall be constructed of cast iron.

2.14 BRICK FOR MANHOLES

A. Brick used for constructing manholes shall be hard burned common brick meeting ASTM Specification No. C-32-50, Grade NA or concrete brick meeting ASTM Specification No. C-55-37.

2.15 PRECAST REINFORCED CONCRETE MANHOLES

A. Precast reinforced concrete manhole sections shall conform to ASTM Specification C-478. All joints for precast sections shall be watertight and shall be of material specifically designed for use in precast manhole joints.

2.16 SELECT FOUNDATION MATERIAL

A. The select foundation material shall be crushed stone or gravel passing 1 inch and retained on No. 4 sieve and shall be free of debris or other matter that would prohibit a smooth bed for the pipe.

2.17 POLYVINYL CHLORIDE (PVC) SERVICE PIPE

A. Pipe shall be manufactured from ultra-high molecular weight polyethylene (average molecular weight of 1,750,000) defined by ASTM D-1248-68 PE Type II (3306). Pipe shall be made of all virgin material and shall conform to Commercial Standard CS-266-63.

B. The pipe shall be permanently imprinted with manufacturer's brand name, pipe size, commercial standard notation, identification of the National Sanitation Foundation approval, recommended working pressure and production code.

C. Pipe dimensions and tolerance shall correspond with copper tubing sizes.

D. Pipe shall have working pressure of 160 psi at 73.4°F and must be capable of maintaining test pressures of 340 psi at 73.4°F for 1000 hours.

E. Pipe connections for PVC service connections shall be by compress joint methods and utilize approved sleeves.

2.18 STAINLESS STEEL AIR PIPING

A. Stainless steel air piping 2 inches in nominal diameter and smaller shall be Schedule 40S per ASTM A312. Stainless steel air piping larger than 2 inches in nominal diameter shall be Schedule 10S per ASTM A312. Fittings for stainless steel air piping 2 inches nominal diameter and smaller shall be socket-weld , Schedule 40S per ASTM A403. Fittings for stainless steel air piping larger than 2 inches in nominal diameter shall be butt-weld Schedule 40S per ASTM A403. All pipe and fittings shall be 304L stainless steel.

B. Flanges shall be 304L stainless steel rated for three (3) times the maximum pressure experienced in the pipe and with a bolt pattern to match the flange mated with.

PART 3 - EXECUTION

3.1 GENERAL PIPE INSTALLATION

A. Inspection:
1. Of Material at Factory - All materials are subject to inspection and approval at the plant of the manufacturer. All materials shall meet the requirements hereinafter specified, and the Contractor shall have made by a laboratory, approved by the Engineer, tests showing the material does meet the specifications. The records of the tests shall be furnished prior to the pipe being laid. The cost of such test will be borne by the Contractor.
2. Of Materials at Delivery Point - During the process of unloading, all pipe and accessories shall be inspected by the Contractor for loss or damage in transit.
3. Field Inspection. All pipe and accessories shall be laid, jointed, tested for defects and for leakage with pressure in the manner herein specified in the presence of the Engineer or his authorized inspector, and subject to his approval.
4. Disposal of Defective Material - All material found during the progress of the work to have cracks or other defects will be rejected and the Contractor shall promptly remove from the site of the work such defective material.

B. Handling Pipe and Accessories:
1. Care - Ductile iron pipe, fittings and other accessories shall, unless other-wise directed, be unloaded at the point of delivery, hauled to and distributed at the site of the project by the Contractor; they shall at all times be handled with care to avoid damage. In loading and unloading, they shall be lifted by hoists or slid or rolled on skidways in such a

manner as to avoid shock. Under no circumstances shall they be dropped. Pipe handled on skidways must not be skidded or rolled against pipe already on the ground.

2. At Site of Work - In distributing the material at the site of the work, each piece shall be unloaded opposite or near the place where it is to be laid in the trench.
3. Care of Pipe Coating - Pipe shall be handled in such manner that a minimum amount of damage to the coating will result. Damaged coating shall be repaired in a manner satisfactory to the Engineer.
4. Bell Ends, How Faced - Pipe shall be placed on the site of the work parallel with the trench alignment and with bell ends facing the direction in which the work will proceed unless otherwise directed.
5. Pipe Kept Clean - The interior of all pipe, fittings, and other accessories shall be kept free from dirt and foreign matter at all times.

C. Alignment and Grade:
1. General - All pipe shall be laid and maintained to the required lines and grades with fittings and valves at the required locations, with joints centered and spigots home and with all valve stems plumb.
2. Protecting Underground and Surface Structures - Temporary support, adequate protection and maintenance of all underground and surface utility structures, drains, sewers and other obstructions encountered in the progress of the work shall be furnished by the Contractor at his own expense.
3. Deviation with Engineer's Consent - No deviation shall be made from the required line or grade except as directed by the Engineer.
4. Sub-Surface Explorations - Whenever necessary to determine the location of existing pipes, valves or other underground structures, the Contractor shall examine all available records and shall make all explorations and excavations for such purpose.
5. Depth of Pipe Cover - All pipe shall be laid to the depth shown or described, measured from the established street grade or the surface of the permanent improvements to the top of the barrels of the pipe.

D. Excavation and Preparation of Trenches:
1. Description - The trench shall be dug to the alignment and depth required and only so far in advance of pipe laying as the Engineer shall permit. The trench shall be so braced and drained that workmen may work therein safely and efficiently. It is essential that the discharge from pumps to lead to natural drainage channels, to drains, or to sewers.
2. Width - The trench width may vary with and depend upon the depth of trench and the nature of the excavated material encountered, but in any case shall be of ample width to permit the pipe to be laid and jointed properly and the backfill to be placed and compacted properly. The minimum width of unsheeted trench shall be 18 inches, and for pipe 10 inches or larger, at least one foot greater than the nominal diameter of the pipe.
3. Pipe Foundation in Good Soil - The trench, unless otherwise specified, shall have a flat bottom, conforming to the grade to which the pipe is to be laid. The pipe shall be laid upon sound soil cut true and even so that the barrel of the pipe will have a bearing for its full length.
4. Correcting Faulty Grade - Any part of the trench excavated below grade shall be corrected with approved material, thoroughly compacted.
5. Pipe Foundation in Poor Soil - When the bottom uncovered at sub-grade is soft and in the opinion of the Engineer cannot support the pipe, a further depth and/or width shall be excavated and refilled to pipe foundation grade with select foundation material. This select foundation material shall be placed in 6 inch layers and be thoroughly compacted to the satisfaction of the Engineer.

6. Bell Holes Required - Bell holes of ample dimensions shall be dug in earth trenches at each joint to permit the jointing to be properly made.
7. Braced and Sheeted Trenches - Wherever necessary to prevent caving, excavations in sand, gravel, sandy soil or other unstable material shall be adequately sheeted and braced. Where, in the opinion of the Engineer, sheeting is required to protect adjacent paving, structures or other property, sheeting shall be used when ordered by the Engineer. Where sheeting and bracing are used, the trench width shall be increased accordingly. Trench sheeting shall remain in place until the pipe has been laid, tested for defects, and repaired if necessary, and the earth around it compacted to a depth of 2 feet over the top of the pipe.
8. Care of Surface Material for Reuse: If local conditions permit their reuse, all surface materials suitable for re-use in restoring the surface shall be kept separate from the general excavation material.
9. Manner of Piling Excavated Material - All excavated material shall be piled in a manner that will not endanger the work and that will avoid obstructing sidewalks and driveways. Gutters shall be kept clear or other satisfactory provisions made for street drainage. Also storm drains shall be kept clear.
10. Trenching by Machine or by Hand - The use of trench-digging machinery will be permitted except in places where operation of same will cause damage to trees, buildings or existing structures above or below ground; in which case hand methods shall be employed.
11. Barricades, Guards, and Safety Provisions - To protect persons from injury, and to avoid property damage, adequate barricades, construction signs, torches, red lanterns and guards as required shall be placed and maintained during the progress of the construction work and until it is safe for traffic to use the trenched highway. Rules and regulations of the local authorities respecting safety provisions shall be observed.
12. Traffic and Utility Controls - Excavation for pipe laying operations shall be conducted in a manner to cause the least interruption to traffic. Where traffic must cross open trenches, the Contractor shall provide suitable bridges at street intersections and driveways. Hydrants under pressure, valve pit covers, valve boxes, curb stop boxes, fire or police call boxes, or other utility controls shall be left unobstructed and accessible during the construction period.
13. Flow of Drains and Sewers Maintained - Adequate provisions shall be made for the flow of sewers and drains encountered during construction, and the structures which may have been disturbed shall be satisfactorily restored upon completion of the work.
14. Property Protection - Trees, fences, poles and all other property shall be protected unless their removal is authorized; and any property damaged shall be satisfactorily restored by the Contractor.
15. Interruption of Water Service - No valve or other control on existing systems shall be operated for any purpose by the Contractor without approval of the Engineer, and all consumers affected by such operation shall be notified by the Contractor at least one hour before the operation and advised of the possible time when the service will be restored.
16. Removing Pavement - The Contractor shall remove pavement as necessary for installing the new pipe lines and appurtenances and for making connections to existing pipe lines. Pavement shall be cut back from the top edges of ditch lines for a distance of at least 9 inches on each side of the ditch to allow for solid bearing edges for pavement to be replaced.
    a. Marking - Before removing any pavement, the pavement shall be marked for cuts neatly paralleling pipe lines and existing street lines. Asphalt pavement shall be broken along the marked cuts by use of jack hammer or other suitable tool.

Concrete pavement shall be scored to a depth of approximately 1½ inches along the marked cuts. Scoring shall be done by use of a rotary saw, after which the pavement may be broken below the scoring by use of a jack hammer or other suitable tool.

b. Machine Pulling - No pavement shall be machine pulled until completely broken and separated along the marked cuts.

c. Damage to Adjacent Pavement - the pavement adjacent to pipe line trenches must not be disturbed or damaged due to any cause such as caving ditch banks, indiscriminate use of construction machinery, etc. The Contractor shall remove the damaged pavement and shall replace at his own expense.

E. Pipe Laying:

1. Manner of Handling Pipe and Accessories into Trench - Proper implements, tools and facilities shall be provided and used by the Contractor for the safe and convenient prosecution of the work. All pipe and fittings shall be carefully lowered into the trench, piece by piece, by means of a derrick, ropes, or other suitable tools and equipment, in such manner as to prevent damage to pipe or pipe coating. Under no circumstances shall pipe or accessories be dropped or dumped into the trench.
2. Hammer Test - Before lowering and while suspended, the pipe shall be inspected for defects and rung with a light hammer to detect cracks. Any defective, damaged or unsound pipe shall be rejected.
3. Laying the Pipe - The spigot shall be centered in the bell, the pipe shoved into position, and brought into the alignment; it shall be secured there with earth carefully tamped under and on each side of it, excepting at the bell holes. Care shall be taken to prevent dirt from entering the joint space.
4. Preventing Trench Water from Entering Pipe - At times when pipe laying is not in progress, the open ends of pipe shall be closed by approved means, and no trench water shall be permitted to enter the pipe.
5. Cutting Pipe - Cutting of pipe for inserting valves, fittings, or closure pieces shall be done in a neat and workmanlike manner without damage to the pipe.
6. Bell Ends to Face Direction of Laying - Unless otherwise directed, pipe shall be laid with bell ends facing in the direction of laying; and for lines on an appreciable slope, bells shall at the discretion of the Engineer, face upgrade.
7. Permissible Deflection at Joints - Wherever necessary to deflect pipe from a straight line, either in the vertical or horizontal plane, to avoid obstructions, to plumb stem, or where long radius curves are permitted, the degree of deflection shall be approved by the Engineer.
8. Unsuitable Conditions for Laying Pipe - No pipe shall be laid in water, or when the trench conditions or weather is unsuitable for such work, except by permission of the Engineer. Full lengths of pipe shall be used wherever possible. Short lengths of pipe with couplings will not be permitted, except as may be approved by the Engineer to eliminate overstressed or misalignment. All pipe shall be cut to exact measurement and shall be installed without forcing or springing.

F. Pipe Supports:

1. The Contractor shall furnish all necessary supports, including all clamps, rods, angles, channels, plates, etc., for supporting the various piping installed by him under this contract. The Contractor shall obtain the Engineer's approval of the method of supporting the piping before installation. Drawings shall reference standard pipe hanger designs shown in the plans.

2. Pipe Lines close to the floor may be supported from the floor by structural shapes or by poured concrete blocks or piers. In such cases, care shall be taken to avoid blocking floor drainage.
3. Structural Steel, as indicated on the structural drawings may be used for supporting pipe hangers with the approval of the Engineer. Structural members shall not be drilled or welded for hangers without the approval of the Engineer.
4. Expansion Bolts shall be used only upon the approval of the Engineer.
5. All Vertical Piping shall be properly supported with suitable brackets to prevent swinging or sagging.
6. Heavy Valves or Fittings shall be supported by hangers, poured concrete, blocks, or other special provisions that may be necessary to avoid stress on the piping.
7. The Maximum Spacing of Pipe Supports for steel and ductile iron piping shall be in accordance with the following table, except where otherwise indicated on the drawings.
   a. Pipes ½" and ¾" - Not more than 6.5’ O.C.
   b. Pipes 1" and 1¼" - Not more than 8’ O.C.
   c. Pipes 1½" and 2" - Not more than 10’ O.C.
   d. Pipes 6" and larger - Not more than 16’ O.C.
8. The Maximum Spacing of Pipe Supports for PVC piping shall be in accordance with the following table:
   a. Pipes 1" and 1½" - Not more than 5’ O.C.
   b. Pipes 2" and - Not more than 6’ O.C.
   c. Pipes 3" and - Not more than 7’ O.C.
   d. Pipes 4" and - Not more than 7’ O.C.
   e. Pipes 6" and larger - Not more than 9’ O.C.

G. Joints and Fittings: Joints and fittings shall be installed in strict accordance to the recommendations of the manufacturer.

H. Anchorage of Bends, Tees, and Plugs:
1. Limiting Pipe Diameter and Degree of Bend - Reaction or thrust backing shall be applied on all pipe lines 4 inches in diameter or larger at all tees, plugs, caps and at bends deflecting 22½° or more.
2. Material for Reaction Backing - Reaction or thrust backing shall be of concrete of a mix not leaner than 1 cement, 2½ sand, 5 stone, having compressive strength of not less than 2,000 psi. Backing shall be placed between solid ground and the fitting to be anchored the area of bearing on pipe and on ground in each instance shall be no less than that shown on the drawings. The backing shall, unless otherwise directed, be so placed that the pipe and fitting joints will be accessible for repairs.
3. Metal Harness- Metal harnesses or tie rods and pipe clamps of adequate strength to prevent movement, or other suitable means may be used instead of concrete backing, as approved by the Engineer. Steel rods and clamps shall be galvanized, or otherwise rustproof treated, or shall be painted as directed by the Engineer.

I. Leakage Test:
1. Pressure During Test - After the pipe has been laid and partially backfilled as specified, all newly laid pipe, or any valved section of it shall be subjected to hydro-static pressure test. Pressure to be one and one-half times the maximum pressure experienced in the pipe section at any given time or 50 psig, whichever is greater. The Contractor shall prepare a schedule of all pipes to be tested and proposed test pressure for approval of the Engineer.

2. Duration of Pressure Test - The duration of each pressure test shall be at least two hours continuous or until the line has been completely inspected for visible leaks, whichever is greater.
3. Procedure - Each section of pipe shall be slowly filled with water and specified test pressure, measured at the lowest point of elevation, shall be applied by means of a pump connected to the pipe in a satisfactory manner. The pump, pipe connections, gauges and all necessary apparatus shall be furnished by the Contractor.
4. Expelling Air Before Test - Before applying the specified test pressure, all air shall be expelled from the pipe. To accomplish this, taps shall be made, if necessary at points of highest elevation, and afterwards tightly plugged.
5. Permissible Leakage - Suitable means shall be provided by the Contractor for determining the quantity of water lost by leakage under normal operating pressure. No pipe installation will be accepted until or unless this leakage is less than 10 U. S. Gal. per 24 hours per mile of pipe per inch nominal diameter.
6. Correcting Leakage - Should any test of combined section of pipe laid disclose leakage per mile of pipe greater than that specified, or if individual sections show leakage greater that the specified limit, the Contractor shall, at his own expense, locate and repair the defective joints or other points of leakage until the leakage is within the specified allowance as evidenced by retesting.
7. Leakage Defined - Leakage is defined as the quantity of water to be supplied into the newly laid pipe, or any valved section of it necessary to maintain the specified leakage test pressure after the pipe has been filled with water and the air expelled.

J. Backfill:
1. Backfilling - Backfill material shall be free from rocks or boulders and shall be deposited in the trench simultaneously on both sides of the pipe for the full width of the trench to an elevation of at least 6 inches above the top of the barrels of the pipe. Materials shall be dry enough to compact to the equivalent density of the surrounding earth. If too dry, the backfill material shall be dampened. Backfill containing broken pavement shall not be used.
    a. The remainder of the backfill shall be accomplished in layers, by an approved method that will obtain the density required in that particular location as defined in Section 31 22 00. Care shall be taken to prevent damage to the pipe by compaction equipment.
2. Deficiency of Backfill by Whom Supplied - Any deficiency in the quantity of material for backfilling the trenches, or for filling depressions caused by settlement, shall be supplied by the Contractor.

K. Repaving: Any pavement cut by these operations shall be repaved in a workman-like manner and restored to their original condition as shown or specified. The paving shall be of material equal to that removed and shall be laid in accordance with the specifications covering the type of paving. Where paved streets are cut, shell or gravel shall be provided immediately following backfill and such crossing shall be maintained until repaved. The cost of furnishing the shell or gravel and maintaining the ditches shall be borne by the Contractor. The details of the pavement replacement shall be as shown on the drawings. If no details are shown then replacement shall be as follows:
1. When flexible pavement is replaced, a 6 inch thick concrete base shall be poured for the top width of the trench plus 6 inches on each side and shall be cut back l½ inches below the finish grade of the existing pavement. After the concrete has been cured, the remaining l½ inches shall be paved with a bituminous mix of the same type as that removed. Prior to replacing the bituminous pavement, the 6 inch concrete base shall

receive a tack coat of 0.05 gallons per square yard of cut back asphalt. Where concrete or other types of pavement are removed they shall be replaced with the same type and thickness as that removed. Just prior to repaving, edges shall be squared and cut to a string line so that the ditch will present a neat appearance.

2. Disinfecting: Prior to placing in service all potable water piping shall be disinfected in accordance with AWWA Standard for Disinfecting Water Mains, AWWA C600.

3.2 GRAVITY FLOW PIPES

A. Gravity flow pipes shall be installed according to paragraph 3.l with the following exceptions:

B. Leakage Test: Lines shall be tested for leakage by either infiltration tests or exfiltration tests, as appropriate. Leakage as measured by either the infiltration test or exfiltration test shall not exceed 0.25 gallons per inch of diameter per hour per 100 feet of line.

1. Unless otherwise directed by the Engineer, all gravity flow pipe and laterals will be tested for leakage. The Contractor will provide for water and all equipment necessary to make the required tests at no cost to the Owner.
2. Exfiltration testing will be performed where the ground water table is less than one foot above the top of the sewer main at the midpoint of the test section.
3. Infiltration testing will be performed where the ground water table is more than one foot above the top of the sewer main at the midpoint of the test section.
4. Where grades are slight, two sections between manholes may be hydrostatically tested at once. All laterals in the test section shall be installed prior to testing. Laterals running from wye branches on the mains shall be plugged at their upper end if the test head would cause them to overflow.
5. Where exfiltration testing is required, a section of sewer line shall be prepared for testing by plugging the upstream opening of the downstream manhole and all openings in the upstream manhole except the downstream opening. Exfiltration testing will be performed by filling the upstream manhole of the test section with water to within one foot of the top of the manhole ring. At the beginning of the test the elevation of the water in the upper manhole shall be carefully measured from a point on the manhole rim. After a period of one hour, or less, with the approval of the Engineer, the water elevation shall be measured from the same point on the manhole rim and the loss of water during the test period calculated. If directed by the Engineer, enough water shall be precisely measured into the upper manhole to restore the water to the level existing at the beginning of the test, and the amount added shall be used to determine the leakage.
6. Where infiltration testing is required a section of sewer line shall be prepared for testing by plugging all holes in the upstream manhole except the downstream opening. Infiltration testing will be performed by measuring the amount of flow coming into the downstream manhole by a method approved by the Engineer.
7. Sewer sections showing leakage in excess of that allowed shall be repaired or reconstructed as necessary to reduce the leakage to that specified as evidenced by retesting.
8. The Contractor's attention is, however, directed to the fact that the stipulation of a maximum allowable leakage shall in no way relieve the Contractor of his obligation to correct, stop or otherwise remedy individual leaks in the system due to defective workmanship or material even though such leakage might come within the allowable maximum.

9. An air test may be substituted for the water test only with specific approval of the Engineer. When allowed, the air test shall be conducted in conformance with the requirements and procedures as directed by the Engineer.

C. Test for Displacement of Sewers: Gravity flow lines shall be inspected by the Engineer and Contractor to determine whether any displacement of the pipe has occurred after the trench has been backfilled and tamped as specified. The test shall be completed as follows: A light shall be flashed between manholes by means of reflecting sunlight with a mirror. If the illuminated interior of the pipe line shows poor alignment, displaced pipe, or any other defects, the defects as designated by the Engineer shall be satisfactorily remedied by the Contractor. This test shall be completed prior to any patching or paving of streets and parking areas.

D. Wye and Tee Connections and Laterals: Wyes and tees shall be installed in the sewer mains to provide connection for laterals. Construction shall be as shown on the plans. Wyes and tees shall be of the same material as the sewer main pipe.
1. Riser pipe shall generally be used on sewer mains more than 8 feet below finished grade of the street or the surface of the ground adjacent to the street, and the use of riser pipe shall in all cases be subject to the approval of the Engineer.

E. Manholes: Every manhole is to be fully and completely built as the work progresses, as each manhole is reached, and shall be carried up to the grade as given by the Engineer. Manholes shall be neatly and accurately built according to the plans. Brick walls shall be plastered on the inside and outside as shown on the plans. The invert and bottom curves of all manholes shall be neatly and accurately built, and so formed as to facilitate the entrance and flows of sewage over them. Steps shall be placed as shown on the plans. The Contractor shall furnish properly set in mortar to line and grade, all cast iron frames and covers.

3.3 DRAIN PIPE

A. Drain pipe shall be installed according to Paragraph 3.1 except as follows: The pipes shall be laid with bells upstream on 4 inches of approved coarse aggregate. The pipe shall then be backfilled with a minimum of 1 foot of approved course filler aggregate. A minimum of 24 inches of washed concrete sand shall be placed over the coarse aggregate. The backfill above the filler media shall be of an impervious material.

3.4 WELDED PIPING

A. Welded piping shall be installed according to Paragraph 3.1 with the following exceptions:
1. All welding of steel piping shall be in accordance with the AWWA Standard for Field Welding of steel water piping joints, AWWA C206, latest edition. All welders and machine operators shall be certified as qualified under the above code.
2. All other metallic pipe welding shall be in accordance with the ANSI Code for Pressure Piping, ANSI B31.1 Power Piping, latest edition. All welders and welding machine operators shall be certified as qualified under the above code.

3.5 PIPE IDENTIFICATION

A. All exposed pipes shall be clearly and permanently marked with an identification of its contents or its discharge location. Such identification shall be located, where possible, adjacent to control devices such as valves, pumps, etc. as an aid in operation. Letters and arrows shall be located so as to be clearly visible. Size of letters shall be determined from table below. Flow direction in pipe shall also be clearly and permanently marked with arrows every 10 feet. All letters and arrows shall be color coded as directed by the Engineer. Pipes carrying chlorine (gas or solution) shall be painted yellow and letters and arrows shall be black.

Outside Diameter of Pipe or Covering (in.)	**Min. Height of Letters (in.)**
1.25 or smaller	0.5
1.5-2	0.75
2.5-6	1.25
8-10	2.5
Larger than 10	3.5

3.6 STRESS ON EQUIPMENT OR STRUCTURES

A. All pipes and fittings shall be made up, fitted, checked, and supported in place prior to actual connection. Connections shall be made only on aligned pipe and fittings. Prying, forced bending, forced twisting, etc., of pipe and fittings will not be allowed. Any systems found to be constructed in this manner shall be removed and replaced with new materials that have not been strained at no cost to the Owner.

END OF SECTION 33 05 53

SECTION 33 31 13.01 - POLYVINYL CHLORIDE (PVC) SEWER PIPE AND SERVICE PIPE

PART 1 - GENERAL

1.1 SCOPE

A. The work covered by this section includes furnishing all labor, equipment, and materials required to install and test polyvinyl chloride (PVC) pipe, including accessories, as shown on the Drawings and/or specified herein.

1.2 QUALITY ASSURANCE

A. The Contractor, at the Engineer's request, shall furnish a certificate from the manufacturer of the pipe and fittings that the manufacturer is fully competent and capable of manufacturing PVC sewer pipe, fittings, and accessories of uniform texture and strength that will fully comply with these Specifications and have so manufactured this class of pipe in sufficient quantities to be certain that it will meet all normal field conditions of usage. The manufacturer must have adequate equipment and quality control facilities to be sure that each extrusion of pipe is uniform in texture, dimensions, and strength.

B. Pipe shall be tested when requested by the Engineer and all pipe so designated shall be tested in accordance with ASTM D 2412 "Standard Method of Test for External Loading Properties of Plastic Pipe by Parallel Plate Loading."

C. Each length of pipe and each fitting shall have the following data clearly marked on each piece:
   1. Manufacturer's name
   2. Pipe size and use
   3. PVC compound used
   4. ASTM material specification for the PVC compound used

1.3 SHOP DRAWING AND ENGINEERING DATA

A. Complete shop drawing and engineering data shall be submitted to the Engineer in accordance with the requirements of the section entitled "Submittals" of these Specifications.

1.4 STORAGE AND PROTECTION

A. PVC piping and accessories shall be stored and protected in accordance with the requirements of the section entitled "Storage and Protection" of these Specifications.

B. PVC pipe and fittings shall be stored under cover.

C. All pipe and accessories shall be stored above ground and fully supported so as not to bend or deflect excessively under its own weight.

1.5 COLOR

A. Sewer pipe shall be any color other than white, blue or purple.

PART 2 - PRODUCTS

2.1 PVC PIPE AND FITTINGS

A. The pipe and fittings shall be homogenous throughout and free from visible cracks, holes, foreign inclusions, or other injurious defects. The pipe shall be as uniform as commercially practical in color, opacity, density, and other physical properties.

B. The manufacturer shall provide waterstops, acceptable to the Engineer, which shall be applied to the outside of the plastic pipe when the pipe is to be enclosed in any structure where concrete or mortar is used which will prevent leakage along the outer wall of the barrel of the pipe.

C. No single piece of pipe shall be laid on any project covered by this Specification unless it is found to be generally straight. Such pipe shall have a maximum ordinate as measured from the concave side of the pipe not to exceed 1/16-inch per foot of length. If the deviation exceeds this requirement, then the particular piece of pipe shall be rejected from use until it can comply with this provision.

D. Wyes, tees, bends, adapters, and any other fittings required or directed by the Engineer shall be provided. Engineering data for such fittings showing cross-sectional views with dimensions shall be provided and such data and fittings shall be approved by the Engineer prior to their use. The materials used in the manufacture of fittings shall conform to the requirements for the pipe with which they shall be used and any variation of such requirements shall be subject to the approval of the Engineer. Fittings shall have wall thicknesses equal to or greater than that of the pipe to which they are joined.

2.2 PIPE

A. PVC piping and accessories shall be made from Virgin Type I, Grade 1 PVC compounds with physical and chemical properties conforming to those defined and described in ASTM D 1784 for "Rigid Poly (Vinyl Chloride) Compounds and Chlorinated Poly (Vinyl Chloride) Compounds."

B. The standard length of PVC pipe under this Specification shall be 12.5 feet, except that all pipe used in service lines shall not exceed 10 feet in length unless otherwise approved by the Engineer.

C. For PVC pipe 15 inches and smaller, pipe and accessories shall be manufactured in accordance with the requirements of ASTM D 3034, Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings. Pipe for gravity sewers shall have an SDR of 35 or less.

D. For PVC pipe larger than 15-inch, the pipe and accessories shall be manufactured in accordance with the requirements of ASTM F679, Type T-1 PVC Sewer Pipe and Fittings. Pipe for gravity sewer shall have a minimum pipe stiffness of 46 psi.

2.3 JOINTS

A. PVC pipe joints shall be the bell and spigot type subject to the approval of the Engineer. The bell shall consist of an integral wall section stiffened with two PVC retainer rings which securely lock the solid section rubber ring into position and shall meet or exceed the requirements of ASTM D-3212.

B. Joints shall be sealed with a rubber O-ring gasket, and shall be of a composition and texture which is resistant to common water, and which will endure permanently under the conditions likely to be imposed by this usage. The gasket installation shall be done in accordance with the pipe manufacturer's instructions using all the necessary materials, lubricants and equipment recommended by the manufacturer.

PART 3 - EXECUTION

3.1 PIPE LAYING

A. Before sewer pipe is placed in position in the trench, the bottom and sides of the trench shall be carefully prepared and bracing and sheeting installed where required. A mason's line, supported at intervals not exceeding 50 feet, shall be stretched tightly above ground level at a grade parallel to and directly above the axis line of the pipe. Each pipe shall be accurately placed to the exact line and grade called for on the Drawings by measuring down from this line to the invert of the pipe in place. The Contractor shall furnish all labor and materials necessary for erecting batter boards and establishing lines and grades thereof.

B. The Contractor may use the laser beam method of setting a line and grade for the sewer by using the laser beam coaxially through the center of the sewer being laid. The laser beam projector is to be rigidly mounted to its support platforms, with a 2-point suspension, or equivalent, assuring that all ground and equipment vibrations are kept to an absolute minimum. All equipment including equipment necessary to control atmospheric conditions in the pipe to keep line and grade to acceptable standards of accuracy shall be furnished by the Contractor. The laser beam system must be operated by competent experienced men who have been properly trained to operate the equipment used.

C. The Contractor shall stake check pegs at all manholes throughout the job. Check pegs midway between manholes and any other check points deemed necessary to assure accuracy of the equipment shall be provided by the Contractor.

D. Each piece of pipe and special fitting shall be carefully inspected before it is placed and no defective pipe shall be laid in the trench. Pipe laying shall proceed upgrade, starting at the lower end of the grade and with the bells uphill. No pipe shall be laid except in the presence of an inspector representing the Engineer. Trench bottoms found to be unsuitable for foundations after pipe laying operations have started shall be corrected and brought to exact line and grade with approved compacted materials.

E. Bell holes shall be of sufficient size to allow ample room for making the pipe joints properly. Bell holes shall not be cut out more than ten joints ahead of pipe laying. The bottom of the trench between bell holes shall be carefully graded so that the pipe barrel will rest on a solid foundation for its entire length as shown on the Drawings. Each joint shall be laid so that it will

form a close concentric joint with adjoining pipe in order to avoid sudden offsets of inequalities in the flow line.

F. Water shall not be allowed to run or stand in the trench while pipe laying is in progress or before the joints are completely set or before the trench has been backfilled. The Contractor at no time shall open up more trench than his available pumping facilities are able to dewater. Where sewer pipelines are located in or across stream beds or drainage ditches, the Contractor shall divert the stream flow and dewater each section as the work progresses.

G. No joints shall be made where pipe or joint materials have been soiled by earth in handling until such soiled surfaces are thoroughly cleaned by wire brushing and wiping until all traces of the earth are removed.

H. As the work progresses, the interior of all pipe shall be kept thoroughly clean. After each line of pipe has been laid, it shall be carefully inspected and all earth, trash, rags, and other foreign matter removed from the interior. A filled bag or other approved type of follower shall be pulled through the line immediately after each joint is made in order to remove any debris which may be left on the inside of the pipe.

I. Backfilling of trenches shall be started immediately after the pipe in place has been inspected and approved by the Engineer and backfill shall be deposited and compacted as detailed on the Drawings.

J. Installation of service pipe shall conform to the appropriate requirements of main line sewers.

3.2 INSTALLATION OF TEES, WYES, AND PLUGGED STUBS

A. Tee branches or wyes shall be installed in the sewer lines at all places shown on the Drawings, specified herein or otherwise directed by the Engineer. Tee branches on pipe less than 12 inches in diameter shall be cast or extruded and manufactured monolithic with the barrel.

B. Plugged pipe stubs for future connections to manholes and sewerage structures shall be installed where shown on the Drawings or directed by the Engineer.

C. Plugged stubs and such branches of pipelines that are not to be used immediately shall be closed with PVC stoppers held securely in place.

D. Where specifically directed by the Engineer or shown on the Drawings, connections to reinforced concrete pipe over 18 inches in diameter shall be made in accordance with details shown on the Drawings.

3.3 CONNECTIONS

A. If the work consists of the construction of a sewer that is to replace an existing sewer, all of the existing service lines shall be kept in operation and connected to the new line.

B. Connections shall be made to all existing sewer lines in the vicinity of the work by removing a section of the sewer from the existing line and inserting in the space a tee branch of proper size or by the construction of a manhole over the existing line.

C. Connections to existing manholes or inlets where no plugged stubs exist shall be made by cutting a hole in the wall of the existing structure, inserting a length of sewer pipe into the hole, filling around same with concrete or mortar and troweling the inside and outside surfaces of the joint to a neat finish. The bottom of the manhole shall be shaped to fit the invert of the sewer pipe as specified under the section entitled "Manholes" of these Specifications.

D. Connections to building services shall be made in a neat and workmanlike manner. Cleanout plugs shall be installed, wherever feasible, by making the connections with a standard wye or tee.

3.4 EXISTING UTILITIES

A. All existing sewers, water lines, gas lines, underground conduits, telephone lines, sidewalks, curbs, gutters, pavements, electric lines, or other utilities or structures in the vicinity of the work shall be carefully protected by the Contractor from damage at all times. Where it is necessary for the proper accomplishment of the work to repair, remove and/or replace any such utility, the work shall be done under the provisions set forth in the "General Conditions." No separate payment shall be made for removing and replacing and/or repairing damaged existing sewers; water, gas, electric, telephone lines or conduits; or other utilities, culverts, drains, or conduits of similar existing services or structures. Similar repair and replacement of sidewalks, curbs, gutters, and pavements are provided elsewhere in these Specifications.

B. Sewers shall be laid to provide at least 6 feet of horizontal separation from any existing or proposed water main or at least 3 feet of horizontal separation from any existing or proposed reclaimed water main. If conditions prevent the 6 foot separation, the sewer may be constructed closer to a water main if it is laid in a separate trench and if the elevation of the top of the water main is at least 18 inches above the invert of the sewer.

C. When sewers cross under water mains, the top of the sewer shall be at least 18 inches below the bottom of the water main. If necessary, the water main shall be relocated to provide this separation or reconstructed with mechanical-joint cast iron or ductile iron pipe for a distance of 10 feet on each side of the sewer. One full length of water main shall be centered over the sewer so that both joints will be as far from the sewer as possible.

D. When it is impossible to obtain proper horizontal and vertical separation as stipulated above, both water main and sewer shall be constructed of mechanical-joint cast iron pipe and shall be pressure tested to assure water tightness.

E. When sewer lines cross under culverts where the sewer and the culvert are less than 18 inches apart, the sewer line shall be encased in concrete or shall be constructed of ductile iron if shown on the drawings.

3.5 CLEANING

A. Clean out all pipe prior to testing by propelling snug-fitting inflated rubber ball through pipe or by using pressure cleaner. Properly dispose of all material removed.

3.6 INSPECTION AND TESTING

A. After completion of any section of sewer, the grades, joints and alignment shall be true to line and grade. Joint surfaces shall be smooth. There shall be no visual leakage and the sewer shall be completely free from any cracks and from protruding joint materials, deposits of sand, mortar, or other materials on the inside.

B. Infiltration or exfiltration testing shall be performed on all pipe and manholes installed in accordance with the following procedure:
   1. Determine if the water table is at least 2 feet above the top of the sewer pipe at the upstream manhole for each run of pipe. If so, infiltration testing will be allowed for that run using the procedure described below. If not, exfiltration testing will be required for that pipe run as described below.
   2. For infiltration testing, plug the pipe where it exits both the downstream and upstream manholes. Allow at least 2 hours and determine how much water has leaked into the pipe. If the water level in the downstream manhole is not at least 2 feet below the groundwater table outside the manhole, reduce the time allowed for the test and repeat. Calculate the leakage rate in U.S. gallons per inch of pipe diameter per 24 hours. If the leakage rate is 50 or less, the pipe and manhole in that run pass the leakage test. If the leakage rate is above 50, repair the pipe or joints and repeat the test until that pipe run passes the leakage test.
   3. For exfiltration testing, plug the pipe where it enters both the downstream and upstream manholes. Fill the upstream manhole with water so that the water level in the manhole is at least three feet above the water level outside the manhole or the top of the pipe, whichever is greater. Allow at least 2 hours and determine how much water has leaked out of the pipe. If the water level in the upstream manhole is not at least two feet above the water level outside the manhole and the top of the pipe, reduce the time allowed and repeat the test. Calculate the leakage rate in U.S. gallons per inch of pipe diameter per 24 hours. If the leakage rate is 50 or less, the pipe and manhole in that run pass the leakage test. If the leakage rate is above 50, repair the pipe or joints and repeat the test until that pipe run passes the leakage test.

C. Low pressure air testing may be used in lieu of infiltration testing at the Contractor's request and upon approval by the Engineer. When approved by the Engineer, low pressure air test shall be made in accordance with the procedures and standards listed below.
   1. Plug all pipe outlets with suitable test plugs. Brace each plug securely to prevent blowouts. As a safety precaution, pressurizing equipment shall include a regulator set at no higher than 6.0 psig to avoid over-pressurizing and damaging an otherwise acceptable line. Never pressurize line above 6.0 psig. No one shall be allowed in the manholes during testing.
   2. If the pipe to be tested is submerged in groundwater, insert a pipe probe by boring or jetting, into the backfill material adjacent to the center of the pipe, and determine the pressure in the probe when air passes slowly through it. This is the back pressure due to groundwater submergence over the end of the probe. All gauge pressures in the test should be increased by this amount.
   3. Add air slowly to the portion of the pipe installation under test until the internal air pressure is raised to 4.0 psig.
   4. After an internal pressure of 4.0 psig is obtained, allow at least two (2) minutes for air temperature to stabilize, adding only the amount of air required to maintain pressure.
   5. When pressure decreases to 3.5 psig, start stopwatch. Determine the time in seconds that is required for the internal air pressure to reach 2.5 psig. Minimum permissible pressure

holding times for runs of single pipe diameter are indicated in the table. Times for mixed pipe sizes of varying lengths should be calculated as described in ASTM F 1417-92, paragraph 9.6, using formula t = K x d/q (q = 0.0015).

Pipe Diameter (in.)	Min. Time (min:sec)	Length for Min. Time (ft.)	Time for Longer Length (sec)	Specified Minimum Time for Length (L) Shown (min:sec)							
				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
42	39:48	57	41.883 L	69:48	104:42	139:37	174:30	209:24	244:19	279:13	314:07
48	45:34	50	54.705 L	91:10	136:45	182:21	227:55	273:31	319:06	364:42	410:17
*Q is the allowable leakage rate in cu.ft./min/ft^2 of inside surface area of pipe (Q=0.0015)											

D. Any leakage, including active seepage, shall be corrected by removal and replacement of pipe or joint where such leakage exists until the pipelines meet the requirements of the allowable leakage specifications.

E. Contractor shall furnish all supplies, materials, labor, equipment, services, etc., needed to make infiltration or exfiltration tests, including water. No separate payment will be made for equipment, supplies, material, water or services.

F. The maximum allowable deflection for PVC pipe is 5%. After the PVC pipe has been installed and backfilled, the Contractor shall check the deflection by pulling a vertical floating pin type go/no go mandrel sized at 95% of the actual inside diameter of the pipe used through the pipe. Deflection tests shall not be conducted before the elapse of 24 hours after backfilling. Any pipe not passing the mandrel shall be replaced and rechecked. Minimum diameters of mandrels to be used are:

Pipe Size (in)	Min. Mandrel Ø (in.)
8	7.28
10	9.08
12	10.79
15	13.20
18	16.74

G. Final Inspection Preceding Acceptance: Final inspection will include a visual inspection of each section sewer by looking from manhole to manhole with the aid of reflected sunlight or an electric torch. Such light used for inspection shall be plainly visible from manhole to manhole. Reflected light from manhole to manhole will not be considered as plainly visible light and shall be reason for rejection of the section of sewer as not being laid true to line and grade. The pipe shall be true to both line and grade; shall show no leaks, shall be free from cracks, and protruding joint materials which will reduce the full cross sectional area. Ground water infiltration shall not exceed the rates hereinbefore stipulated and shall be distributed uniformly throughout the collecting system and not occur through a few joints. All joints shall be tight. All finished work shall be neat in appearance and of first class workmanship.

3.7 CLEANUP

A. After completing each section of the sewer line, the Contractor shall remove all debris, construction materials, and equipment from the site of the work, grade and smooth over the surface on both sides of the line and leave the entire right-of-way in a clean, neat, and serviceable condition.

END OF SECTION 33 31 13.01

SECTION 33 32 19.31 – SYSTEM PUMP STATION RETROFITS

PART 1 - GENERAL

1.1 SCOPE

A. This specification governs replacement pumps and controls for three existing Wastewater Pumping Stations within the Brundidge Sewer System to be refurnished. The retrofit of the recirculation pumping station at the Wastewater Treatment Facility is covered under a separate specification section.

1.2 DESCRIPTION OF WORK

A. The three (3) existing pump stations to be refurbished in this contract are all recessed impeller submersible stations constructed in the 1980's. The work of this contract entails replacing the pumps and controls in all three stations. Existing wet wells and valve vaults are to be retained but the concrete slabs over the wet well and vaults are also to be replaced.

PART 2 - PRODUCTS

2.1 SUBMERSIBLE NON-CLOG PUMPS

A. The Contractor shall furnish and install two (2) submersible non-clog sewage pumps in each station. Each pump shall be furnished with a 1750 RPM submersible electric motor suitable for operation on 230 volts, 3 phase, 60 hertz service, a 4-inch cast iron discharge connection with 316 S.S. wedge-type anchor bolts, upper guide bar bracket, 25 feet of stainless steel lifting chain with intermediate lifting links located every 3', and a minimum of 50 feet of Hypalon jacketed type SPC cable sized according to NEC and ICEA standards. Each stainless steel lifting chain shall be rated for a minimum lifting load of 2,400 pounds and shall be no smaller than 5/16" diameter.

B. Submersible pumps provided for this project shall be the size and type as outlined herein. Each pump shall be capable of handling raw unscreened sewage, shall meet the performance characteristics as outlined below, and shall be properly selected to conform in the intended application. Pump performance criteria for each pump shall be as follows:

Armory Pump Station

- Design Rating: 125 GPM @ 78' TDH
- Hydraulic Efficiency: 35% (minimum)
  - Secondary Rating: 350 GPM @ 63' TDH
- Hydraulic Efficiency: 60%
- Minimum Shutoff Head: 82'
- Motor HP: 10 HP
- Motor Speed: 1745 RPM
- Impeller Design: double vane, non-clog

- Minimum Sphere Size: 3” diameter
- Discharge Piping Size: 4” diameter
- Model: Ebara Model 100DLMKFU67.5 or Equal by KSB or Equal

Allen Road Pump Station

- Design Rating: 135 GPM @ 77’ TDH
- Hydraulic Efficiency: 36% (minimum)
  - Secondary Rating: 350 GPM @ 63’ TDH
- Hydraulic Efficiency: 60%
- Minimum Shutoff Head: 82’
- Motor HP: 10 HP
- Motor Speed: 1745 RPM
- Impeller Design: double vane, non-clog
- Minimum Sphere Size: 3” diameter
- Discharge Piping Size: 4” diameter
- Model: Ebara Model 100DLMKFU67.5 or Equal by KSB or Equal

Tenille Road Pump Station

- Design Rating: 135 GPM @ 44.5’ TDH
- Hydraulic Efficiency: 42% (minimum)
  - Secondary Rating: 250 GPM @ 38’ TDH
- Hydraulic Efficiency: 55%
- Minimum Shutoff Head: 53’
- Motor HP: 5 HP
- Motor Speed: 1740 RPM
- Impeller Design: double vane, non-clog
- Minimum Sphere Size: 3” diameter
- Discharge Piping Size: 4” diameter
- Model: Ebara Model 100DLMKFU63.7 or Equal by KSB, ABS or Equal

C. The Specifications and project drawings depict equipment and materials that are manufactured by Ebara Pumps Americas Corporation, which have been deemed the most suitable for the service anticipated. This is not intended to eliminate other products of equal quality and performance. However, the Contractor shall prepare his bid based on the specified equipment for purposes of determining low bid. Award of a contract shall constitute an obligation to furnish the specified equipment and materials.

1. After execution of the contract, the Contractor may offer substitutions to the specified equipment for consideration. Any equipment that is proposed for substitution must be pre-submitted in full compliance with the requirements of these Specifications, shall be superior in construction and performance to that specified herein, and the higher quality shall be demonstrated by a list of current users of the proposed equipment in similar installations.
2. In the event that the Contractor obtains Engineer's approval for equipment substitution, the Contractor shall, at his own expense, make all resulting changes to the enclosures, buildings, piping or electrical systems as required to accommodate the proposed equipment.

Revised detail drawings illustrating the substituted equipment shall be submitted to the Engineer prior to final acceptance and payment.

3. It will be assumed that the cost to the Contractor for the alternate equipment is less for the proposed substitution. Contractor shall provide quotes from the specified manufacturer, and from the proposed alternate manufacturer, and the contract price shall be reduced by an amount equal to the difference between the two.

D. Submersible pumps provided for this project shall be the size and type as outlined herein. Submersible pumps for the Armory and Allen Road pump stations shall be identical, with fully interchangeable parts. Each pump shall be capable of handling raw unscreened sewage, shall meet the performance characteristics as outlined above, and shall be properly selected to conform in the intended application. The pumps shall be capable of handling raw, unscreened sewage. The discharge connection elbow shall be permanently installed in the wet well along with the discharge piping. The pumps shall be automatically connected to the discharge connection elbow when lowered into place, and shall be easily removed for inspection or service. There shall be no need for personnel to enter pump well.

E. Site power furnished to pump station shall be **230/3/60 3-wire**, maintained within industry standards. Voltage tolerance shall be plus or minus 10 percent. Phase-to-phase unbalance shall not exceed 1% average voltage as set forth in NEMA standard MG-1. Control voltage shall not exceed 132 volts.

F. All major parts of the pumping unit(s) including the casing, impeller, suction cover, motor frame and discharge elbow shall be manufactured from gray cast iron, ASTM A-48 Class 35. Castings shall have smooth surfaces devoid of blow holes or other casting irregularities. The casing design shall be centerline discharge with a large radius on the cut water to prevent clogging. Units shall be furnished with a discharge elbow and a 125# flat face ANSI flange.

1. All exposed bolts and nuts shall be 304 stainless steel. All mating surfaces of major components shall be machined and fitted with NBR O-rings where watertight sealing is required. Machining and fitting shall be such that sealing is accomplished by automatic compression of O-rings in two planes and O-ring contact is made on four surfaces.
2. Internal and external surfaces are prepared to SPPC-VISI-SP-3-63 then coated with a Zinc-Rich primer. The external surfaces are then coated with a Ni-Build TNEMEC series 46H-413 Coal Tar paint.

G. Pump impellers shall be a double vane, semi-open back-swept design, dynamically balanced, and shall be designed for solids handling with a long thru let without acute turns. The inlet edge of the impeller vanes shall be angled toward the impeller periphery to facilitate the release of objects that might otherwise clog the pump. The design shall also include back pump out vanes to reduce the pressure and entry of foreign materials into the mechanical seal area.

1. A lip seal shall be located behind the impeller hub to further reduce the entry of foreign materials into the seal area.
2. Impellers shall be directly connected to the motor shaft with a slip fit, key driven and secured with an impeller bolt. The pump design shall include a replaceable cast iron suction cover. Impeller and suction cover shall be designed such that it may be adjusted to maintain working clearances and hydraulic efficiencies. The combination of a guide pin at the suction cover and the slot on the surface of the suction cover lead foreign material out to the discharge side of the casing to avoid clogging.

H. Pumps shall be sealed against leakage by means of a double mechanical seal in tandem arrangement. Seals shall operate bathed in propylene glycol or oil, with the filled seal chamber to

be designed to prevent over-filling and to include an anti-vortexing vane to ensure proper lubrication of both seal faces. Lower face materials shall be silicon carbide, upper faces carbon on ceramic, and the seals shall include NBR elastomers and 304 stainless steel hardware. The seal system shall not rely on a pumping medium for lubrication.

1. Mechanical seals shall require no special maintenance or routine unit adjustment, yet shall be easily inspected or replaced. No seal damage shall result from operating the pump for short periods of time out of the pumped liquid.

I. Each submersible pump motor will be driven by a motor of the size and RPM as indicated above, and shall be suitable for operation on electrical service as indicated herein or as shown on the Plans. Each motor and pump shall be suitably connected to comprise an integral pumping unit. Motors shall be an air-filled induction type with a squirrel-cage rotor and shell-type design, and shall be built to NEMA MG-1, Design B specifications. The use of oil filled motors, with the associated losses of pump efficiency, will not be considered acceptable. Motors shall be inverter duty and rated for VFD operation.

1. Stator windings shall be copper, insulated with moisture resistant Class H insulation, rated for 356° F (180° C). The stator shall be dipped and baked in Class H varnish and heat shrunk fitted into the stator housing. Rotor bars and short circuit rings shall be manufactured of cast aluminum. The motor shaft shall be one-piece AISI 403 SS material, rotating on two permanently lubricated ball bearings designed for a minimum life of 50,000 hours.
2. The motors shall be a premium efficient design, and shall meet the efficiency standard in accordance with IEC 60034-30, level IE3. Motor rating tests shall be conducted in accordance with IEC 60034-2-1.
3. The minimum motor service factor shall be 1.15, and the motor shall be capable of up to twenty (20) evenly-spaced starts per hour. Motors shall be designed for continuous duty pumping at a maximum sump temperature of 104° F. The motor shall be non-over loading over the entire specified range of operation and be able to operate at full load for up to 30 minutes while unsubmerged without damage to the unit.
4. The junction chamber shall be sealed off from the stator housing with O-rings and packing and contain a terminal board mounted on a DIN rail for simple connection of the cable conductors to the motor stator and sensor leads. The use of wire nuts or crimp-type connectors is not acceptable.

J. Voltage and frequency tolerances shall be a maximum ±10 / 5% respectively. Motor over temperature protection shall be provided by three miniature thermal protectors (one per phase) embedded in the windings. Mechanical seal failure protection shall be provided by a mechanical float switch located in a chamber above the seal. The float switch shall be comprised of a magnetic float that actuates a dry reed switch encapsulated within the stem. Should the mechanical seal fail, liquid shall be directed into the float chamber, and the rising liquid activates the switch opening the normally closed circuit. The float body and float shall be a polypropylene material with a 316 SS stopper.

K. The power and monitor cables shall be sized according to NEC & ICEA standards. Power/sensor cable shall be provided in sufficient length to reach the junction box or pump control panel, as indicated on the Plans, without need of any splicing. The outer jacket of the power/sensor cable shall be oil resistant chloroprene rubber. The motor and cable shall be capable of continuous submergence underwater without loss of watertight integrity to a depth of 65 feet. Cables entering the motor housing shall include three (3) separate sealing systems to prevent the entry of liquid into the motor housing. Cable entry systems shall be comprised of primary, secondary, and tertiary sealing methods.

1. The primary seal shall be achieved by an Buna-N tapered elastomeric grommet compressed between the cable gland, cable housing, and 304 stainless steel washers.
2. Secondary sealing shall be accomplished with a compressed O-ring made of Buna-N material. Compression and subsequent sealing shall preclude specific torque requirements.
3. The system shall also include tertiary sealing to prevent leakage into the motor housing due to capillary action through the insulation if the cable is damaged or cut. The cable wires shall be cut, stripped, re-connected with a copper butt end connector, and embedded in epoxy within the cable gland assembly, providing a dead end for leakage through the cable insulation into the motor junction area.
4. The cable entry system design shall be the same for both the power and control cables, with only the components varying to accommodate outside diameters of the respective cable jackets.

L. The pump manufacturer shall provide a monitor relay for each pump, for installation in the pump control panel during production. The relays shall continuously monitor the status of both the motor thermostats and the internal leakage sensor as described herein, and shall be designed to provide dry contacts for integration with the control panel's indicating pilot lights and alarm indication.
1. The relay unit shall continuously apply a low voltage DC signal to the motor thermal sensor to check its status. If the unit detects that the thermal sensor contacts are closed (i.e., normal condition), the overtemperature indication remains off, and the overtemperature relay is energized, closing the contacts between the designated terminal connections.
2. If the motor thermal sensor contacts open (i.e., overtemperature condition), the overtemperature indication is turned on, and the alarm relay is de-energized, opening the contacts between the designated connections.
3. When the high motor temperature condition has cleared, the unit will reset based on the position of alarm reset mode select switch (auto or manual). When in the auto position, the overtemperature alarm resets automatically. If the switch is in the manual position, the overtemperature reset pushbutton must be pushed for approximately 1.5 seconds to clear the alarm.
4. The unit shall also continuously apply a low voltage DC signal to the leakage sensor to check its status. If the unit detects that the leakage sensor contacts are closed (i.e., normal condition), the seal leakage indication remains off, and the leakage relay is energized, closing the contacts between the designated connections.
5. If the leakage sensor contacts open (i.e., seal leakage condition), the seal leakage indication is turned on and the leakage alarm relay is de-energized, opening/closing the contacts between the designated terminal connections.
6. Monitor relays shall be Ebara Model EPMR-4, and shall be factory-installed in the pump station control panel specified herein, and wired for operation as specified.

M. Each pump shall be provided with a guide rail system to allow for removal of the pumps from their mounted position in the wet well, without need for operators to enter the wet well. The design shall incorporate two (2) 304 S.S. Schedule 40 guide rails sized to mount directly to the quick discharge connector at the floor of the wet well and to a 316 stainless steel upper guide rail bracket mounted at the top of the wet well below the hatch opening as shown on the Plans. 316 stainless steel intermediate guide brackets are recommended for guide rail lengths greater than twenty (20) feet. Guide rails are not part of the pump package and shall be supplied by others.
1. The quick discharge connector shall be manufactured of gray cast iron, ASTM A48 Class 30. It shall be designed to adequately support the guide rails, discharge piping, and pumping unit under both static and dynamic loading conditions with support legs that are suitable for anchoring it to the wet well floor. The face of the inlet quick discharge

connector flange shall be perpendicular to the floor of the wet well. The discharge flange of the quick discharge connector shall conform to ANSI B16.1 Class 125.

2. The pump design shall include an integral self-aligning sliding bracket. Sealing of the pumping unit to the quick discharge connector shall be accomplished by the single linear downward motion of the pump. The entire weight of the pump unit shall be guided to and wedged tightly against the inlet flange of the quick discharge connector, making metal to metal contact with the pump discharge forming a seal without the use of bolts, gaskets or O-rings.

N. A 304 stainless steel lifting chain of adequate length and rating for removing and installing the pump unit shall be provided. The chain shall be provided with a round intermediate link with a 2-1/4" inside diameter located every three feet, to facilitate pump removal in the field. This link will allow for sliding a pinch bar through the link (or a tag line provided with a lifting hoist, if specified) to pick up the chain, more than once if necessary, at multiple intervals during pump removal and installation.

O. The pump manufacturer shall warrant the equipment supplied for this project to be of the highest quality construction, free of defects in material or workmanship. The written pump warranty shall indicate the specific parts and labor to be covered on a pro-rated basis, for a period of five (5) years or 10,000 hours from the date of shipment for typical permanent municipal installations.

1. It is not intended that the manufacturer assume liability for consequential damages or contingent liability that may arise from the failure of any product or parts to operate properly, however caused; whether by or resulting from, or arising out of, any defects in design or manufacture, delays in delivery, replacements or otherwise.
2. All equipment provided shall be covered by the manufacturer's warranty, excepting only those items that are normally consumed in service, such as light bulbs, oils, grease, packing, gaskets, O-rings, etc. Any components that fail to perform as specified by the Engineer, or as represented by the manufacturer, or that are proven defective in service during the specified warranty period shall be replaced, repaired, or satisfactorily modified by the manufacturer.
3. Pump warranty shall become effective upon the acceptance of equipment by the Owner or the Engineer, or sixty (60) days after installation, or ninety (90) days after shipment, whichever occurs first.

P. Manufacturer will supply five (5) sets of detailed standard submittal drawings, Operation and Maintenance instruction manuals, and parts list. Standard submittals will consist of:

- Pump outline drawings
- Control Data
- Access Frame Data
- Typical Installation Guides

1. Parts lists and technical manuals shall be supplied after start-up has been completed.

Q. The pump manufacturer shall demonstrate their experience in the production and support of sewage pumping systems by having a minimum of 1,000 units of similar type pumps installed and operating for not less than five (5) years in the U.S.

R. A portable davit crane shall be provided for the purpose of removing the sewage pumps from the wet well for inspection and/or maintenance. The crane shall be designed to facilitate pump removal in a single continuous lift without any need for intermediate grabs of chain, or the use of

special equipment or components. The crane shall be properly sized and rated for the pumps to be provided, with a minimum capacity of 2000 pounds at minimum reach and 45-degrees position, and 1100 pounds at full reach and 90-degrees (horizontal) position. Davit crane shall be Thern Commander Series, Model 5PT20 or approved equal, and shall be field- removable for storage and use elsewhere by the Owner as may be required.

1. Crane boom, mast, and base assembly shall be fabricated from heavy duty welded constructed structural steel pipe and tubing that limits deflection and meets ASTM standards. Quick-release clevis style stainless steel pins shall allow for easy field assembly and quick disassembly for transport or storage, without the need for tools. The crane shall have a telescoping boom and adjustable angle of inclination to provide fully adjustable reach to position the lifting hook directly over the pumps, and shall be of adequate height to remove the pumps from the wet well without need of additional clearance or posing interference problems. The boom may be extended to four positions by means of quick-release pins, and angle of inclination shall be adjusted manually by means of a manually-adjustable ratchet-style screw jack. The jack shall be provided with an extension handle for ease of operation. Lifting crane and pedestal base shall be provided with an electrostatic powder coat finish and corrosion-resistant fasteners.
2. Rotation of the crane assembly in the base socket shall be accomplished manually by the operator, by means of a handle provided on the frame. The lifting crane and pedestal base socket assembly shall be provided with a bright red electrostatic powder-coat finish, and shall be fitted with stainless steel fasteners to resist corrosion in harsh environments. Enamel paint shall not be utilized on the davit crane or socket base.
3. The crane winch shall be a worm gear design with a load brake to prevent runaway reverse rotation. The winch shall be provided with a powder coat finish, shall include a square nut on the side of the housing use with a low-speed drill driver, and shall be Thern Model 4WM2-K or approved equal. The winch shall incorporate machine-cut worm gears for accurate operation and long lasting service. Bronze bearings shall be provided. An enclosed oil bath shall provide continuous lubrication of the internal gears to minimize wear. Oil seals shall be provided to keep oil in and dirt out. An internal mechanical brake shall be provided.
4. The winch drum shall be large diameter to minimize wire rope wear during operation. In addition, a slot shall be provided on the face of the winch drum to allow connection of the wire rope specified below without the use of tools. A 1" hex drive nut and manual operating handle shall be provided on the winch. The winch may be operated manually, or can be power driven by a maximum 300 RPM drill-driver as described below.
5. The drill driver provided shall be a 11.5 amp 300 RPM unit, and shall include a right angle drive head and hex socket drive suitable for use with the specified winch. The drill driver shall be suitable for use with 115VAC, so that the accessory receptacle on the side of the pump control panel can be used for operation on site. Drill driver shall be Thern Model ED300-DW11, as offered by Thern, or approved equal.
6. A 316 stainless steel wire rope assembly with a 316 stainless steel hook and swaged bronze ball fitting will be included. The swaged ball will be designed to connect directly to the winch drum without the use of tools. Design of the cable system shall allow the operator to quickly attach or remove wire rope to/from the winch drum by means of the specified swaged ball fitting. Length of rope assemblies shall be based on final wet well elevations as shown on the Plans.
7. In addition to the wire rope assembly noted above, a 12" long tag line shall be provided by the hoist manufacturer, and shall be attached to the end of the boom arm. The tag line shall include 316 S.S. cable and hook assembly as outlined above, and shall be utilized with the pump manufacturer’s chain specified herein, to permit removal of the pumps without need

of entering the wet well. The manufacturer's representative shall demonstrate the use of the lifting hoist at startup of the station.

8. A pedestal base shall be provided to allow removal of the davit crane. The base shall be fabricated of powder-coated steel, and shall be permanently mounted by the Contractor in the location as indicated by the manufacturer's representative. Anchor bolts for the pedestal base shall be provided by the crane manufacturer, and reaction loads shall be supplied with the submittal data to allow the engineer to properly design the base or check loading of the wet well top slab.
9. A job-specific CAD drawing will be provided by the pump station supplier as a part of the station submittal data, indicating the location of the base socket(s) relative to the wet well prior to approval. The drawing shall be prepared for this specific project, and shall reflect the exact pumps specified, as well as the suggested position of the hoist socket relative to the pump station. An external reinforced concrete footer (estimated at one cubic yard - design to be provided by the Engineer) shall be installed by the Contractor in the location shown on the Plans.

S. After installation and successful startup of the pump stations, spare parts and/or equipment shall be provided to the Owner for use during normal operation and/or maintenance of the pumps and control panel. Spare parts shall be provided packed in suitable containers for extended storage. Any parts consumed during the course of equipment startup shall be replaced by the respective manufacturer without cost to the Owner. Spare parts provided shall include the following as a minimum:
1. Twelve (12) oil inspection plug gaskets for each size pump provided
2. One (1) mechanical seal kit for each pump model provided, to include spare bearings and all O-rings required to rebuild the pump when required
3. One (1) complete set of all O-rings required for each pump model provided, in addition to the requirements of Item 1 above
4. Twelve (12) spare LED lights for control panel pilot lights
5. One (1) spare level controller module (if provided)
6. One (1) spare level transducer (if provided)
7. One (1) spare float switch

2.2 CONTROL PANEL

A. GENERAL
1. The control system shall be designed to operate the required number of pumps specified on the drawing at the power characteristics shown on the plans.
2. The control function shall provide for the operation of the pumps under normal conditions, and shall alternate the pumps on each pump down cycle to equalize the run time. In the event the incoming flow exceeds the pumping capacity of the lead pump, subsequent pumps shall automatically start to handle the increased flow. As the flow decreases, the pumps shall cut off at the elevations as shown on the plans.
3. The control shall function as described below. The equipment listed below is a guide and does not relieve the supplier from supplying a system that will function as required.

B. MECHANICAL
1. The enclosure shall be a NEMA 4X Stainless Steel "Painted White" enclosure with a 3-point powerglide handle. The enclosure shall be a wall mount type with a minimum depth of 10" sized to adequately house all the components. Enclosures larger than 60" high x 36" wide shall be provided with 12" high leg stands. The enclosure door gaskets shall be

rubber composition with a retainer or seamless foamed in place to assure a positive weatherproof seal. The gasket material shall not retain memory. The door shall open a minimum of 180 degrees.

2. A polished aluminum dead front inner door shall be mounted on a continuous aircraft type hinge and shall contain cutouts for mounted equipment and provide protection of personnel from live internal wiring. Cutouts for breaker handles shall be provided to allow operation of breakers without entering the compartment. All control switches, indicator pilot lights, elapsed time meters, and other operational devices shall be mounted on the external surface of the dead front. The dead front shall open a minimum of 150 degrees to allow access to equipment for maintenance. A 3/4" break shall be formed around the perimeter of the dead front to provide rigidity.
3. The back plate shall be manufactured of 12 gauge sheet steel and be finished with a primer coat and two (2) coats of baked-on white enamel. All hardware mounted to the subpanel shall be accomplished with machine thread tapped holes. Sheet metal screws are not acceptable. All devices shall be permanently identified using engraved name plates. Use of DYMO type labels is not acceptable.

C. ELECTRICAL

1. The panel power distribution shall include all necessary components and be completely wired with tinned, stranded copper conductors rated at 90°C. All conductor terminations shall be as recommended by device manufacturer.
2. All circuit breakers shall be heavy duty thermal magnetic or motor circuit protectors similar and equal to SQUARE D type HDL. Each motor breaker shall be adequately sized to meet the pump motor operating characteristics and shall have a minimum of 10,000 amps interrupting capacity for 230 VAC and 18,000 amps at 480 VAC. The control circuit shall individually be controlled by a heavy duty breaker.
    a. Circuit breakers shall be indicating type, providing "on-off-trip" positions of the operating handle. When the breaker is tripped automatically, the handle shall assume a middle position indicating "trip."
    b. Thermal magnetic motor breakers shall be quick-make and quick-break on manual and automatic operation and have inverse time characteristics secured through the use of bimetallic tripping elements supplemented by a magnetic trip.
    c. Breakers shall be designed so that an overload on one pole automatically trips and opens all legs. Field installed handle ties shall not be acceptable.
    d. The following breakers shall be included in each control panel:
        1) Main Breaker (properly sized)
        2) Motor Breaker 1 (properly sized)
        3) Motor Breaker 2 (properly sized)
        4) Control Power Breaker (20 amp / 1 pole)
        5) Duplex Receptacle Breaker (20 amp / 1 pole)
        6) SCADA Breaker (20 amp / 1 pole)
        7) Site Light Breaker (20 amp / 1 pole)
    e. A phase converter (PC) will be supplied that will convert single phase power into three phase power to operate a pump or motor. The PC is a variable frequency drive (VFD) oversized to run a pump or motor at sixty hertz when the run command is received. The (PC) will be preprogrammed to match the electrical characteristics of each pump. If three phase utility power is available at the lift station site, then NEMA Rated FVNR Square D starters shall be used instead of phase converters.
    f. Control transformers shall be provided to provide the 120 VAC and/or 24 VAC for control circuits when required. Transformers shall be fused on the primary and secondary circuits. The secondary windings shall be grounded.

g. A lightning-transient protector with tell-tale warning lights on each phase to indicate loss of protection on the individual phases shall be provided. The device shall be solid state with a response time of less than 5 nanoseconds with withstanding surge capacity of 6500 amperes. Unit shall be instant recovery, long life and have no holdover currents.

h. The Phase Monitor shall be a 12 pin, plug in style unit. The Phase Monitor shall monitor Under Voltage, Phase Reversal, Loss of Power and Phase Imbalance. The motor starter circuits shall be de-energized upon sensing of any of the faults and shall automatically restore service upon return to normal power. The Phase Monitor shall be available to monitor Over Voltage as an option. The output relay shall be DPDT rated at 10A to 240 VAC.

D. ALARM SYSTEM

1. The alarm light shall be a weatherproof, shatterproof, red light fixture with a 40 watt bulb to indicate alarm conditions. The alarm light shall be turned on by the high level alarm and flash until the condition has been corrected. An open contact shall be provided for remote monitoring.

E. LEVEL CONTROL SYSTEM

1. A 24 volt ac control system shall be provided for the float control system. The system shall provide for the automatic and manual control and alternation of the pumps to maintain a pumped down condition of the wet well. Float regulators adjusted to the level shown on the plans shall sense levels. A float regulator shall control each pump and when tilted shall turn the pump on. The pump(s) shall remain "on" until a common "off" level is reached.
2. In the event the "off" float regulator fails, the system shall sense the failure and switch the "off" level to the second float regulator. The system shall provide indication for the regulators and indicate a failure of the "off" unit.
3. Control systems contingent on the "off" float regulator supplying control power to the other units is not acceptable.

F. ANCILLARY EQUIPMENT

1. A three position HOA switch shall be provided for each pump. The switch shall be NEMA 4X rated with 10 amp contacts except when provided on a dedicated controller unit. A position indicating legend plate shall be provided. The HOA switches shall be mounted on the inner dead front door unless provided in the controller units.
2. A green run pilot indicator shall be mounted on the dead front door. Level indicator lights or indicators shall be provided.
3. An elapsed time meter shall be mounted on the dead front door. The meter shall operate on 120 VAC, shall indicate in hours (6 digits) and tenths and shall be non-resettable.
4. The alternator shall be a plug in, solid state unit with lead-lag-auto selector and test switches except when provided in a dedicated control device. The unit shall operate on 120 VAC and provide DPDT ten amp rated contacts. Two LEDs shall indicate the next position to run as lead pump.
5. A thermal heater and thermostat shall be installed to maintain the internal temperature of the enclosure above the dew point.
6. Control wiring shall be copper, tinned, UL1015, 18ga. minimum.
7. One Mini-Cas 120 unit shall be supplied for each pump to monitor the pump for over-temp and leakage. The unit shall have an 11 pin, round base to mate with a standard 11 pin socket. The unit shall also be flanged in order to allow dead front door mounting with use of 11 pin reverse socket, Omron part number P3GA-11.

a. The unit is to be able to be powered by 24 VAC, 24VDC, or 120 VAC, and to contain LED indication for power on, over-temp, and leakage conditions. The unit shall contain an over-temp reset push-button to reset the unit after the fault has cleared, as well as a selector switch that allows the selection of manual or auto reset.
b. The sensor input circuitry is to contain both hardware and software filters for noise immunity, as well as sensor input short circuit protection.

8. Four mechanical stainless steel float switches shall be supplied for level control and be suspended at the desired height from its own cable. The float switches shall be supplied with a minimum 40' of cable.
9. Remote Contacts for SCADA shall be provided and include: High Level, Pump 1 Fail, Pump 2 Fail, Pump 1 Seal Fail, Pump 2 Seal Fail.

G. MANUFACTURER
1. Miscellaneous:
a. A final as-built drawing encapsulated in mylar shall be attached to the inside of the front door. Schematics shall be done in ladder logic with wire numbers and line numbers. Real time cross referencing of relay contact to line numbers shall be given as well as written description of component function on each circuit of the drawing. From/To wire and termination reports shall be shown on the as-built drawings. Drawings shall be available in HTML format. Terminal strip layouts shall be provided for ease of connecting external devices.
b. All component parts in the control panel shall be permanently identified with engraved legend plates as designated on the drawings. A list of all legends shall be available in Excel format and attached with the schematics on the panel door.
c. All equipment shall be tested to the operational requirements. Each control function shall be activated to check for proper indication.
d. All equipment shall be guaranteed for a period of one year from the date of installation. The guarantee is effective against all defects in workmanship and/or defective component. The warranty is limited to replacement of or repair of the defective equipment.
e. The manufacturer shall be a UL508 shop and provide evidence on the end product.

H. CONTROL PANEL STAND: The control panel stand shall be fabricated from stainless steel or aluminum. Control panel stand legs shall be cemented into the ground a minimum of 3 feet deep. The control panel shall be bolted at all four corners to the control panel stand with stainless steel hardware. When installed, the bottom of the control panel shall be approximately 4 feet above finished grade elevation.

I. LIQUID LEVEL CONTROLS
1. Each liquid level sensor shall be a 5-1/2" diameter, type 316 stainless steel Teflon-Coated float switch with a mercury switch inside having a 20 Amp rating at 115 and flexibly supported by a PVC jacketed cable. The float switch cable shall be type SO with three #14 AWG fine-stranded copper conductors (one conductor to serve as a ground). The cable shall have an additional neoprene jacket in the hinge area where the most cable flexing typically occurs. The switch shall be soldered to the cable leads and potted in epoxy to make a watertight seal. The switch assembly shall be installed in the neck of the stainless float body and held in place by a dual circular crimp. Each float switch electrical cord shall be sixty (60) feet in length.
2. Each float switch shall have a minimum total net buoyancy of 2 pounds (total net buoyancy = weight of displaced volume of water less weight of float). Each float switch shall be U.L. listed for sewage wet well applications.

3. The Contractor shall furnish, install and wire the float switches as shown on the drawings. The float switches shall be mounted to a stainless steel cable/weight kit utilizing all stainless steel float switch mounting hardware for common float switch suspension in the wet well. The cable/weight assembly shall utilize a 20# plastisol coated cast iron weight and be suspended from an eyelet in the top slab of the wet well.

2.3 PORTABLE PUMP HOIST

A. Only one portable hoist is required for the project; however, base sockets shall be provided on all submersible pump stations. The Contractor shall provide one portable pump hoist manufactured from 304 stainless steel tubing capable of supporting 1,330 pounds. The hoist shall have an adjustable reach of 36 inches and shall have a lifting height of 49 inches. Overall hoist height shall be 60 inches. The hoist shall be designed and manufactured for use with floor mounted stainless steel sockets to be installed at each submersible pump station. The hoist shall be provided with lubricated pulley, winch and static loop for double line operation. The winch shall be provided with a minimum of 45 feet of stainless steel cable and safety hook that is capable of supporting 1,330 pounds. The winch shall be provided with a self-actuating brake to hold the load securely in place if the handle is released.

B. Base sockets shall be constructed of 304 grade stainless steel. Sockets shall be designed for easy installation of hoist and to allow full rotation of hoist with minimum operator effort. Hoist shall fit in the socket with minimum play. Sockets shall be secured to the wet well top with stainless steel hardware.

2.4 DOCUMENTATION: The manufacturer, if requested, will supply a minimum of 5 sets of standard submittal data. Standard submittal data consists of:

1. Pump catalog data;
2. Pump performance curve;
3. Base elbow and guide rail assembly data;
4. Access frame data;
5. Typical installation drawing;
6. Control panel data;
7. Panel wiring schematic;
8. Accessory data;
9. Installation & Operation Manuals with Parts List.

2.5 ACCESS FRAME AND GUIDE RAILS

A. An aluminum access frame and cover, rated at 300 lb./sq. ft., complete with hinged and flush locking mechanism, 316L stainless steel upper guide rail holder and 316L stainless steel float bracket shall be furnished and installed on the pump station wet well and valve box. Frame shall be securely placed and mounted above the pumps. Frame shall be provided with sliding nut rails to attach the accessories required. Lower guide rail holders shall be integral with the discharge connection. Guide rails shall be Type 316L Schedule 40 stainless steel of the size indicated on the drawings. The guide rails shall not support any portion of the weight of the pump. The access frame and cover for the valve box shall be mounted in the center of the valve box as shown on the plans. Doors shall be skid proof design. All mounting brackets and hardware for the guide rail system shall be constructed of stainless steel.

B. A "Safe Hatch" shall be supplied with the wet well access cover. Each "Safe Hatch" shall be designed to combine covering of the hole per OSHA Standard 1910.23 and shall include fall through protection and controlled confine space entry.

C. A safety grate shall be made of 6061-T6 aluminum with a minimum ultimate strength of 38,000 psi and a minimum yield strength of 35,000 psi, as per ASTM B221. Grate design shall use safety factors as defined in the "Specifications for Aluminum Structures," by the Aluminum Association, Inc., 5th addition, December 1986 for "Bridge Type Structures."

D. Aluminum grating shall be designed to withstand a minimum live load of 300 pounds per square foot. Deflection shall not exceed 1/150th of the span.

E. Aluminum grate openings shall be 5" x 5", which will allow for visual inspection of the pit and float adjustment, once the access hatch is open.

F. Each aluminum grate shall be provided with a permanent hinging system, which will lock the grate in the 90 degree position once opened.

G. Design of the system must assure fall through protection is in place after the door has been closed, thereby protecting the next operator.

H. Each grate shall have an opening arm, with a red vinyl grip handle, which will allow opening of the grate, while providing the grate as a barrier between the operator and the pit. The opening arm shall also be equipped with a controlled confined space entry locking device (lock provided by others). This locking device will prevent unauthorized entry to the confined space. The grating system will allow anyone to make visual inspection and float adjustments without entering the confined space.

I. Grate shall be painted with OSHA type safety orange paint.

J. Welding shall be in accordance with ANSI/AWS d1.2-90 Structural Welding Code for Aluminum.

2.6 DISCHARGE PIPING: All discharge piping inside wet well shall be of Class 52 ductile iron. All fasteners will be of 300 series stainless steel. Discharge piping shall be furnished and installed in the wet well as shown on the plans.

PART 3 - EXECUTION

3.1 MAINTENANCE OF SERVICE: Prior to removing each station from service make arrangements using temporary pumps or other means to maintain sewer service to existing customers until construction is complete.

3.2 DEMOLITION: Demolish existing slabs, fences, etc., per Section 02 41 00 of these specifications. Existing pumps, controls, piping, and hatches to be removed shall remain the property of the Owner. Coordinate disposition with the Owner.

3.3 INSTALLATION

A. The Contractor shall install, level, align, and lubricate the pump, controls, piping, and related equipment as indicated on project drawings or outlined in the manufacturer's O&M manuals. Installation must be performed in strict accordance with the written instructions supplied by the manufacturer at time of delivery.

B. Check motor and control data plates for compatibility to site voltage. Install and test the station ground prior to connecting line voltage to station control panel.

C. Prior to applying electrical power to any motors or control equipment, check all the wiring for tight connections. Verify that protective devices (fuses and circuit breakers) conform to project design documents. Manually operate all of the circuit breakers and switches to ensure operation without binding. Open all circuit breakers and disconnects before connecting utility power. Verify line voltage, phase sequence and ground before actual start-up.

3.4 START-UP

A. The pumps and controls shall be tested at start-up by a qualified representative of the manufacturer. A start-up report as provided by the manufacturer shall be completed before final acceptance of the pumps and controls.

B. The pump and control supplier shall employ factory trained service personnel. These persons shall be authorized by the manufacturer to perform all maintenance and repair work on the above pumps and controls. Factory certification of service personnel shall be provided to the Engineer prior to approval of pumps and controls. Only factory certified personnel shall perform start-up on the specified material. The supplier shall also maintain a fully equipped service facility within 250 miles of the jobsite as well as a complete inventory of all normally replaceable parts for the above pumps and controls. Suppliers which cannot perform factory warranty work in their own service facility shall not be considered. Proof of such facilities shall be furnished to the Engineer.

END OF SECTION 33 32 19.31

SECTION 33 32 19.32 – RECIRCULATION PUMP STATION RETROFIT

PART 1 - GENERAL

1.1 SCOPE

A. This specification governs replacement pumps and controls for the existing Recirculation Pumping Station at the Brundidge Wastewater Treatment Facility to be refurnished.

1.2 DESCRIPTION OF WORK

A. The Recirculation Pump Station at the Brundidge Wastewater Treatment Facility was constructed as a utility pumping station in 1979 and was converted to return sludge service in 1987 when the Facility was converted to an Activated Sludge Plant in 1987. The original recessed impeller submersibles were replaced by self-primers sometime later. The work of this contract entails replacing all existing pumps, controls, discharge piping and valving with new chopper pumps and reverting the station back to utility and waste sludge service.

PART 2 - PRODUCTS

2.1 CHOPPER PUMP DESCRIPTION

A. Each vertical wet well chopper pump furnished for this project will be capable of successfully handling heavy concentrations of solids.

B. The pumps provided for this project shall be proven in similar applications. Adaptations of standard centrifugal pumps that do not incorporate the specified chopper design or dry-run pump capability will not be acceptable, and will constitute basis for rejection of the equipment by the Engineer.

C. Equipment shall meet the necessary performance characteristics outlined below, and shall be selected to conform to the requirements of the intended application. Pump performance criteria for each installation are as follows:

- Design: 500 GPM @ 24’ TDH (61% hyd. efficiency)
- Minimum Motor Size: 7.5 HP
- Maximum Motor Speed: 1165 RPM (nominal)
- Impeller Design: 3-Bladed Chopper Design
- Pump Casing Size: 4” Diameter
- Discharge Pipe Size: 6” Diameter, Class 125 Flanged

D. Pumps shall be Vaughan Model V4S-095 or equal.

2.2 PUMP CONSTRUCTION

A. The chopper pumps shall be specifically designed to agitate and pump waste solids at heavy consistencies. Materials shall be macerated and conditioned by the pump as an integral part of the pumping action.

B. The pumps must have demonstrated the ability to chop through, mix, and pump high concentrations of solids such as plastics, heavy rags, grease and hair balls, wood, paper products and stringy materials without plugging, both in factory testing and in field applications.

C. It is the further intent of these Specifications to describe equipment that is a regular production item of the specified pump manufacturer, and that has a proven record of performance in identical (not just similar) applications.

D. Pump impeller shall be the semi-open chopper type. Chopping/maceration of the materials must be accomplished by the action of the curved, cupped and sharpened leading edges at the bottom of the impeller blades as they move across the cutter bar, creating a smooth, efficient "slicing" effect.
   1. The pump impeller shall be constructed of ASTM A148 cast alloy steel, dynamically balanced, and heat treated to a minimum 60 Rockwell C Hardness.
   2. Pump out vanes shall be provided across the entire diameter of the impeller on the backing plate, in order to reduce pressure in the seal area, and to draw lubricant down from the oil reservoir should seal leakage occur.
   3. The impeller shall have a maximum of three (3) blades, to minimize chances of jamming and/or plugging, and shall be held in place with a key and cutter nut. The impeller shall have no axial adjustments or set screws, and shall not extend past the cutter bar.

E. An opposing cutter bar shall be provided in the suction inlet of the chopper pump. The cutter bar plate will be recessed into the pump bowl providing a funnel-shaped opening, and shall extend diametrically across the entire pump suction opening.
   1. The cutter bar shall be a single cast component recessed into the pump bowl, with a funnel shaped inlet opening. As a part of the casting, segment bars shall extend inwardly, to within .015" of the cutter nut. The set clearance between the cutter bar and impeller shall be adjustable to .005" to .020".
   2. The cutter bar shall be constructed of ASTM A148 cast alloy steel and heat treated to a minimum Rockwell C 60 Hardness.

F. The impeller pump-out vanes shall be specially modified to shear against an upper cutter assembly mounted into the back side of the casing, in order to eliminate any build up of rags, hair, or other stringy material in the seal area or between the impeller and the pump casing. The upper cutter shall be ASTM 148 cast alloy steel and heat treated to a minimum Rockwell C 60 Hardness.

G. A cutter nut used to secure the pump impeller to the shaft, and to eliminate binding or wrapping of stringy materials at the pump inlet and shall be constructed of ASTM A148 cast alloy steel and heat treated to a minimum Rockwell C 60 Hardness.

H. The pump shaft and impeller shall be fully supported by ball bearings. There shall be an AISI 4140 heat treated stub shaft through the pump casing connected through a solid steel shaft coupling to an AISI 1045 stress-proof shaft extension to the top of the pump.

1. All pump shafting shall have a minimum diameter of 1.5 inches in order to minimize deflection during heavy solids chopping.
2. Intermediate shafting sections shall be fabricated of alloy steel, with steel couplings joining sections as outlined above. Steel couplings shall be keyed and provided with set screws to prevent slipping.

I. Shaft support column shall be 4 inch O.D. precision steel tubing welded to steel flanges, and machined with piloted bearing fits to provide concentricity of all components. All support column tubes shall be leak tested. Distance between shaft bearings shall not exceed critical speed dimensions as determined by the pump manufacturer.

J. All pump shafting shall be supported by oil-lubricated ball bearings, with the exception of the top-most bearing which shall be permanently grease packed. With the exception of the top bearing, all shaft bearings shall operate fully submerged in oil as outlined herein. An oil level monitor as described herein shall prevent operation in the event of oil loss.
1. Pump shaft bearings will be oil bath lubricated by an ISO Grade 46 non-foaming turbine oil, with the exception of the top bearing, which shall be grease packed. All column bearings shall be secured by locking collars, and bearings shall have a minimum B-10 bearing life of 100,000 hours.
2. The complete chopper pump assembly shall be capable of operating when completely dry (i.e., with no water in either the pump volute or impeller) for extended periods of time.

K. Shaft thrust developed shall be taken up by either a double row angular contact ball bearing or two back-to-back mounted single row angular contact ball bearings, which bear against a machined shoulder on one side and the seal sleeve on the other side.

L. A mechanical seal shall isolate the bearings from the pumped media at operating temperatures up to 250 F. The mechanical seal shall be fitted with silicon carbide stationary and rotating faces to provide long life expectancy in the presence of grit and abrasive solids.

M. An automatic oil level monitor shall be located above the mounting plate, and be fitted with an internal 50 watt capacity oil level switch to detect oil level and shut off the motor in event of low oil level. The electrical control panel provided shall continuously monitor the oil level in the monitor reservoir, and shall be wired in such a manner as to stop the pump and illuminate an alarm light in the event of a low oil level. The oil monitor shall be easily accessible without removal of the pump from its mounted position, and addition to the oil level shall be easily accomplished from the top of the structure.

N. The pump assembly shall be mounted vertically on a common steel base plate with 150 pound standard discharge flange. Pump discharge piping shall be 6" O.D. fabricated steel tubing, with a Class 125 flanged discharge connection.
1. Discharge piping shall extend above the floor plate, and will be connected to the system piping as indicated on the Plans. A 6" Class 125 flanged connection shall be provided as shown on the Plans to connect to the system piping.
2. The discharge flange shall be provided with a 1/4" NPT pressure tap. The contractor shall provide an isolation cock, tee, and a pressure gauge on each pump. All pipe fittings used to pipe pressure gauges shall be 304 or 316 stainless steel.

O. An elastomeric type flexible coupling shall be provided to transmit power from the drive motor to the stub shaft at the top of the pump. The coupling shall be sized with a minimum service factor of 1.5, based on the drive rated horsepower, and shall be protected with a suitable

coupling guard meeting OSHA requirements. Couplings shall be completely enclosed to prevent accidental contact by the operating personnel.

P. A motor support base shall be provided with each chopper pump, which shall also be fabricated of carbon steel weldment, and furnished with piloted fits to positively aligning the drive motor and pump shaft without need of external adjustments. The motor support base shall be accurately machined to accept the C-flange motor described below without need for adjustment or shims.

Q. The pump assembly cover plate shall be fabricated of carbon steel with a minimum thickness of ½", and suitably reinforced as necessary to support all components without overload or undue stress under any conditions.
   1. The pump manufacturer shall provide certified drawings to the contractor outlining required slab openings for installation of the pump. Lifting eyes or lugs shall be provided on the base plate of all pumps to facilitate on-site handling and installation, as well as future removal by the Owner.
   2. Pump base plates shall not be grouted by the contractor after installation to facilitate future removal by the Owner if required.

R. Stainless steel nameplates shall be permanently attached to each pump and drive motor, and shall provide the manufacturer's model number, serial number, rated capacity, head, speed and all other pertinent data. All nameplate data shall be stamped or engraved on the plate.

2.3 MOTOR REQUIREMENTS

A. Each chopper pump shall be driven by a 7.5HP, 1165 RPM (nominal) motor suitable for operation on 460/3/60 electric service. Motors shall be the vertical solid shaft, ball bearing type, totally enclosed, premium efficiency design suitable for mounting in an outdoor unprotected location as shown on the plans. Each motor and pump shall be connected by means of a flexible coupling as specified herein to comprise an integral pumping unit.

B. Motors shall be provided with TEFC enclosures to permit wash down as a part of the regular maintenance regimen for this installation. Each motor and pump shall be connected by the flexible coupling outlined above so as to comprise an integral pumping unit. Motors shall be provided with C-face mounting to permit accurate alignment of the motor with the pump bearing housing, as specified in Section 2.2 P of these Specifications.

C. Pump motors will be manufactured in accordance with all applicable standards of NEMA, IEEE, AFBMA, NEC, and ANSI. The motors shall be premium efficiency squirrel cage induction type, with normal starting torque and slip characteristics. Winding insulation shall be non-hygroscopic, rated as Class F or better.

D. Pump motors shall be capable of carrying the full load current continuously, without injurious temperature rise in an ambient temperature of 40 degrees C. All motors shall be provided with a minimum service factor of 1.15.

E. Pump motors shall be sized to be non-overloading above the rated nameplate horsepower under any condition of operation from shut-off head to runout capacity. All motor thrust bearings shall be adequate to carry continuous thrust loads under all conditions of pump operation from zero head to shut-off.

F. Design of the pumps shall be such that the motors will not be damaged by sustained operation of the pump when the grease pit sump is completely dry, and when there is no liquid at all within the pump casing.

2.4 PUMP PAINTING

The exterior surfaces shall be solvent washed, sandblasted, and coated with minimum 30 MDFT Tnemec Perma-Shield PL Series 431 epoxy. (except motor).

A. All exposed metal surfaces of the pumps shall be prepared for painting by means of a white metal sandblast meeting the requirements of SSPC-SP5. Immediately after blast cleaning, all pumps and/or replacement parts provided shall be provided with a single primer coat of Tnemec 27WB epoxy if required by the paint system manufacturer. After curing, multiple finish coat(s) of Tnemec Perma-Shield Series 431 epoxy shall be applied to achieve a minimum 30 MDFT. All coatings shall be provided in strict accordance with the coating system manufacturers instructions. Motors shall be provided with the manufacturer's standard enamel paint finish.

B. Coatings shall be applied by the pump manufacturer prior to shipment of pumping equipment to the job site. Additional finish coatings shall be field-applied by the contractor in strict accordance with the requirements of other applicable Sections of these Specifications.

C. Motors shall be provided with the manufacturer's standard machinery enamel, for finish field painting in accordance with the requirements of these Specifications.

2.5 ELECTRICAL CONTROLS

A. A complete level control system shall be provided for the pumping station. Control panels shall be factory-tested to ensure that they function properly. Control panel design shall utilize a submersible level transducer and electronic level control for direct indication of the liquid level in the wet well and subsequent control of the pumps. Backup float switches shall also be provided as outlined herein. All pump start/stop functions shall be controlled from output and speed signals as generated by the level controller.

B. All required electrical control equipment shall be mounted in a single NEMA 4X dead front control enclosure fabricated of 14 gauge 304 S.S. The panel enclosure will be provided with either single or double doors on the front, depending on the space required for the specified equipment and accessories. Each door shall be fitted with a continuous hinge along one side and a stainless steel hinge pin. The enclosure door(s) shall open fully to allow full operator access to all of the control components, and shall be sealed by means of a neoprene gasket. Enclosure door(s) shall be hinged, and shall open fully to allow operator access to all of the control panel components. Doors shall be sealed with neoprene gaskets, and a three-point latch and external handle shall be provided on each door to permit opening without need of disengaging multiple clasps, knobs, or other devices.
   1. Wiring routed to any door mounted devices shall be bundled and confined by means of nylon wrap, and shall be provided with adequate bundle flex provided to allow full opening of the inner door without binding or chafing of the insulation. The enclosure shall be provided with mounting lugs for installation by the contractor in the position shown on the Plans.

2. The control panel shall be equipped with a panel heater to minimize the effects of humidity and condensation. The heater shall include an adjustable thermostat.
3. The enclosure shall be provided with mounting legs capable of supporting the full weight of the assembled panel, and positioning it at roughly eye level. The legs shall be approximately 18" high, shall also be 304 S.S., and shall be secured to the enclosure by the panel manufacturer prior to shipment to the site. The control panel, inner door, hardware, and support legs shall be as manufactured by Hoffman or equal.
4. All enclosures shall be sized to provide not less than 6" of free space below the lowest-mounted component or terminal block provided in the panel, to facilitate field installation and wiring practices. Submittal data provided shall clearly indicate the free space allowance on all applicable drawings.

C. All control components shall be mounted on a removable back panel of fabricated steel. The back panel shall be secured inside the enclosure with collar studs. All controls that are normally required for operation of the pumps, including pilot lights, elapsed time meters, level controller boards, main circuit breaker, circuit breaker locking handles, overload reset pushbuttons, and other equipment that are normally accessed by the operator shall be mounted on a hinged aluminum inner door with fastening hardware to allow opening. All operating controls and instruments shall be securely mounted on the inner door in a manner that allows full opening of the door, and shall be clearly labeled to indicate function.
   1. Operating components to be mounted on the inner door of the enclosure will include the following as a minimum:

      - Main circuit breaker operating mechanism
      - Pump circuit breaker operating mechanisms
      - Liquid level controller
      - Hand-Off-Auto selector switches
      - Elapsed time meters
      - Pilot lights as outlined herein
      - Overload reset buttons (if applicable)
      - Backup controller engaged pilot light

D. The manufacturer shall provide a main circuit breaker with a disconnect handle. Control panel overload combined short circuit KAIC rating shall be determined by the panel manufacturer and clearly indicated on the submittal data provided. Main breaker shall be Square D Power Pack Series or equal. A main ground lug and a ground lug shall also be provided for each pump motor. The mounting surface of all ground connections shall have paint removed before making final connections. The contractor shall make field connections to the main ground lug and each pump motor in strict accordance with the National Electric Code.

E. A main terminal block and ground bar shall be furnished for field connection of the incoming electrical supply. The connections shall be designed to accept copper conductors of sufficient size to serve anticipated pump station loads. Main terminal block shall be mounted to allow incoming wire bending space in accordance with Article 373 of the National Electrical Code (NEC).
   1. All external wiring for sensors, transducer, backup floats, external alarm light, dry output contacts for SCADA connection, or any other devices shall be routed through a suitable terminal strip sized for use with #12AWG wire. All connections to/from the control panel shall be through terminals only.

F. Pump station controls shall conform to third party safety certification. The finished control panel shall bear a serialized UL label listed for "Enclosed Industrial Control Panels". The enclosure, and all components mounted on the sub-panel or control cover, shall conform to UL descriptions and procedures.

G. The control panel shall be equipped with a transient voltage surge suppressor to minimize damage to the pump motors and control from transient voltage surges. The suppressor shall utilize thermally protected silicon-oxide varistors encapsulated in a non-conductive housing. Mechanical indicators shall be provided on each phase to indicate protection has been lost.

H. Each pump motor shall be provided with a circuit breaker, full voltage motor starter, suitable overload protection, and all required timers, etc... that may be required for operation as specified. All required circuitry for starting each pump motor will be contained in a single enclosure. Motor branch circuits provided in the panel shall be of the highest industrial quality, and shall be securely fastened to the removable back plate with screws and lockwashers.

1. Properly sized heavy duty air circuit breakers shall be furnished for each pump motor, and for the main power supply entering the panel, each with a symmetrical RMS interrupting rating of 18,000 amperes at 460VAC. Circuit breakers will be sealed by the manufacturer after calibration to prevent tampering or unauthorized adjustment. A lockable operating mechanism shall be installed on the main and each motor circuit breaker, and shall be mounted on and interlocked with the inner door. It shall not be necessary to open the inner door to switch off the pump circuit breakers, but it shall not be possible to open the inner door with the pump breakers in the "on" position. Simple cut-outs in the inner door for circuit breaker access will not be considered acceptable.
2. Each pump will be provided with an open frame across-the-line NEMA rated magnetic motor. Starters NEMA size 1 and above shall be designed for the additional of at least two auxiliary contacts. Starters rated "0", "00", or fractional sizes are not considered acceptable. All power contacts shall be double-break type, made of cadmium oxide silver. All starter coils shall be epoxy molded for protection from moisture and the corrosive environment that is anticipated. The starters shall be equipped to provide undervoltage release and overvoltage protection on all three phases. Starter contacts and coils shall be easily replaced without removal of the starter from its mounted position in the panel. International or horsepower rated motor starters or contactors shall not be allowed.
    a. Adjustable overload protection shall be provided after each starter, and shall be easily accessed and adjusted from the front of the unit without need to open the starter. Adjustment shall be made by means of a rotary knob, which shall be operated by means of a standard screwdriver. Alarm/control contacts shall be included as may be required to integrate with the pump protection circuitry. The trip setting shall be governed by solid-state circuitry.
3. Overload relays shall be solid-state block type, having visual trip indication with trip-free operation. Electrically resetting the overload will cause one (1) normally open and one (1) normally closed isolated alarm/control contact to reset, thus re-establishing a control circuit. Trip setting shall be governed by solid-state circuitry and adjustable current setting. Trip classes shall be 10, 15, or 20. Additional features shall include phase loss protection, selectable jam/stall protection and selectable ground fault protection.
    a. Where possible, an overload reset pushbutton, mounted on the inner door of the control panel, shall permit resetting the overload relays without need of opening the door.

I. All motor branch and power circuit components shall be of highest industrial quality. The short circuit current rating of power circuit devices shall be a tested combination or evaluated per the National Electrical Code Article 409. The lowest rated power circuit component shall be the overall control panel short circuit rating and shall not be less than the fault current available. The minimum control panel rating shall not be less than 10 kA, RMS symmetrical. Control assemblies operating at 120 volts nominal or less may be provided with transformers which limit the fault current and may be rated less than the minimum required short circuit rating.

J. Oil-tight pilot lights shall be provided as specified herein. Pilot lights furnished shall be in addition to any lights provided as a part of any automatic level controller that may be specified herein. All pilot lights shall be suitable for 120VAC, and shall be mounted in keyed openings on the door of the control panel. Pilot lights shall be push-to-test, shall utilize LED lamps and shall be provided with jeweled glass or flat plastic lenses a minimum of 30 mm in diameter. A common push-to-test button for verifying the condition of pilot light lamps shall also be acceptable.

1. Individual pilot lights will be provided on the door of the control panel to alert station maintenance personnel to a “pump run”, “high stator temperature” or “low oil level” condition for each pump.
2. Each “pump run” light shall be wired in parallel with the related pump motor starter to indicate that the motor is (or should be) running. Running lights shall be green in color.
3. Separate pilot lights indicating “high wet well level”, “low wet well level” and “normal power on” shall also be provided. If possible, output fault contacts from each RVSS starter shall be wired to amber pilot lights mounted on the inner door of the panel as well, to provide operator indication of problems. Alarm pilot lights shall be red, and normal power light shall be white.
4. The pump control panel shall be equipped to terminate pump operation due to either high motor winding temperature or low oil level in the pump, utilizing contacts as outlined herein. If either event should occur, the motor starter will drop out and a “high motor temperature” or “low oil fail” pilot light on the panel door shall indicate that the pump motor has been shut down. The associated circuitry for either condition shall require manual reset. High temperature and seal leak lights shall be red in color.
5. A separate pilot light shall indicate that the backup float controller is active, and that the primary level control system is currently inoperable. Backup active indication pilot light shall be blue in color.
6. Dry output contacts for each of the above-described monitor, status, and/or alarm conditions shall be provided, and shall be wired to dedicated terminals for connection to future SCADA equipment. All monitoring contacts shall be Form B design, capable of carrying a minimum of 10 amps at 120VAC. Dry contact closures shall be separately wired with two separate leads in the panel, and with no common wiring between functions. All dry contacts shall be factory-wired to a separate terminal strip as outlined herein.

K. The control circuit shall be protected by a normal duty thermal-magnetic air circuit breaker which shall be connected in such a manner as to allow control power to be disconnected from all control circuits.

L. Pump mode selector switches shall be connected to permit manual start and manual stop for each pump individually, and to select automatic operation of each pump under control of the liquid level control system. Manual operation shall override the liquid level control system. Selector switches shall be heavy duty, oil-tight design, with contacts rated NEMA A300 minimum.

M. Control panel designs that utilize float switches for level sensing and control shall be provided with a separate alternating relay, as well as a lead-lag-auto selector switch mounted on the door of the control panel.)

1. A lag pump start delay timer shall be provided to prevent the simultaneous starting of pumps after a power failure, or if both pumps are called for by the liquid level control system. Lag pump start delay circuitry may be included in the solid-state level controllers specified elsewhere herein.

N. Six digit elapsed time indicators (non-reset type) shall be connected to each motor starter to indicate the total running time of each pump in "hours" and "tenth of hours".

O. A duplex ground fault indicating utility receptacle providing 115VAC, 60 Hertz, single phase current, shall be mounted on the inner door of the control enclosure. The GFI receptacle circuit shall be protected by a 15 amp thermal-magnetic circuit breaker.

P. The panel shall be equipped with control transformer to supply 115VAC for control and auxiliary equipment. The primary and secondary side of the transformer is to be protected by a thermal magnetic circuit breakers sized to meet the power requirements of the transformer.

Q. The control panel shall be equipped to monitor the incoming power and shut down the pump when required to protect the motor(s) from damage caused by voltage less than 83% of nominal. The motor(s) shall automatically restart when power conditions return to normal.

R. All necessary wiring furnished between components shall be NEMA Class II, Type B, 14 gauge (minimum) stranded copper type THHN, MTW, or THW, rated at 600 volts. All wiring shall conform to the requirements of the NEC as well as applicable state and local codes. Individual wires shall be routed through plastic wiring troughs with snap-on covers, or shall be fastened to the subpan by means of adhesive-backed ties. Loose wiring inside the control panel will not be acceptable.

1. The control panel, as furnished by the manufacturer, shall be completely wired at the factory prior to shipment. The contractor shall field connect the power feeder lines to the main terminal block, final connections to the remote alarm devices, and the connections between the pump and the pump motor control. Wiring, workmanship, and schematic wiring diagrams shall be in compliance with applicable standards and Specifications set forth by the National Electric Code (NEC). All user serviceable wiring shall be type MTW or THW, 600 volts, and shall be color coded as follows:

    - Line and load circuits, AC or DC power — Black
    - AC control circuit less than line voltage — Red
    - DC control circuit — Blue
    - Interlock control circuit, from external source — Yellow
    - Equipment grounding conductor — Green
    - Current carrying ground — White
    - Hot with circuit breaker open — Orange

2. Motor branch conductors and other power conductors shall not be loaded above 60° C temperature rating, on circuits of 100 amps or less. On circuits over 100 amps, the loading shall not exceed 75° C temperature rating. Motor branch wiring shall be 10 gauge minimum, regardless of rating.

3. Control circuit wiring inside the panel, with the exception of internal wiring of individual components, shall be 14 gauge minimum, type MTW or THW, 600 volts. Power wiring shall be 10 gauge minimum. Motor branch and other power conductors shall not be loaded above the temperature rating of the connected termination. Wires shall be clearly numbered at each end in accordance with the electrical diagrams. All wires on the sub-plate shall be bundled and tied.
4. Wires connected to components mounted on the enclosure door shall be bundled and tied in accordance with good commercial practice. Bundles shall be made flexible at the hinged side of the enclosure. Adequate length and flex shall be provided to allow the door to swing to its full open position without undue stress or abrasion on the wire or insulation. Bundles shall be held in place on each side of the hinge by mechanical fastening devices.
5. All power and control wiring in the panel shall be tagged at each end by self-adhering wire markers, and no two wires having different functions within the control panel may be provided with the same markings. Wire numbers must coincide with the schematic diagrams provided by the panel manufacturer.

S. The pump control manufacturer shall provide a common ground bar mounted on the enclosure back plate. The mounting surface of the ground bar shall have any paint removed before making final connections. The contractor shall make the field connections to the main ground lug and each pump motor in accordance with the National Electric Code.

T. A permanent corrosion resistant name plate(s) shall be attached to the control and include the following information:

- Equipment serial number
- Control panel short circuit rating
- Supply voltage, phase and frequency
- Current rating of the minimum main conductor
- Electrical wiring diagram number
- Motor horsepower and full load current
- Motor overload heater element
- Motor circuit breaker trip current rating
- Name and location of equipment manufacturer

U. Control components shall be permanently marked using the same identification shown on the electrical diagram. Identification labels shall be mounted adjacent to the device. Switches, indicators, and instruments shall be plainly marked to indicate function, position, etc. Marking shall be mounted adjacent to and above the device.

V. An external alarm silence pushbutton and relay shall be provided to permit operating personnel to de-energize the audible alarm device (if provided) while corrective actions are underway. After silencing the alarm device, manual reset of the alarm condition shall clear the alarm silence relay automatically. The pushbutton shall be oil tight design with contacts rated NEMA A300 minimum.

W. The station manufacturer will supply a 115VAC alarm light fixture with a vapor-tight red globe, guard, conduit box, and mounting base. The design must prevent rain water from collecting in the gasketed area of the fixture, between the base and globe. The alarm light will be shipped loose, for installation by the contractor in the location as directed by the Engineer. Alarm light shall be as manufactured by Craus Hinds or approved equal.

1. The alarm light circuit shall be equipped with circuitry designed to cause the alarm light to flash. Flash rate shall be approximately 1 second (½ second on and off). Flasher circuitry incorporated into the level controller specified elsewhere herein shall be acceptable for this function.

2.6 LIQUID LEVEL CONTROLLER

A. A set point microprocessor-based level controller shall be provided to control the operation of the pumps. For the purpose of establishing a minimum standard of performance and quality, the controller shall be the Model PC-3000XC, as manufactured by Primex Controls, Inc or equal by USEMCO or equal. The level control will be mounted in the pump control panel as specified above, and shall be completely wired and tested prior to shipment. The manufacturer of the liquid level control system shall be ISO 9001:2000 revision certified, with scope of registration including design control and service after sales activities.

B. The level control system shall automatically start and stop the pumps in response to sensed changes in wet well level, as set forth herein. The level control system shall utilize a submersible transducer for primary level control, but shall also be provided with a backup float system.

C. A microprocessor-based pump controller shall be provided in the panel to receive a single analog process variable input signal and provide user-selectable pump-down control. The controller shall be user-configurable for simplex, duplex, or triplex operation. The liquid level controller shall be Model PC-3000XC, as manufactured by Primex Controls, or approved equal.
   1. The controller shall be an off-the-shelf, preprogrammed unit, dedicated to pump control.
   2. The level controller shall be a standard production item of the control panel manufacturer.

D. The operator interface shall consist of a text/graphical display, dedicated alarm and pump status indicators, operator navigation buttons, and a rotary selector wheel providing intuitive navigation. The display shall be capable of showing all alarm and status information as well as configurable parameters.
   1. The operator interface shall have a display area of not less than 2.7", with 64x256 pixel resolution.
   2. The display shall be based on OLED technology, offering increased energy savings and wide viewing angles.
   3. The controller shall be configured with a main (home) display that shows the analog process variable in engineering units and as a dynamic vertical bar graph. The process variable display shall contain up to four digits with a decimal place. The main display shall also provide indication of lead pump, active alarm indication, and shall show the most current active alarm text message.

E. The level controller shall be provided with predefined inputs and outputs having a total I/O compliment of eleven (11) discrete inputs, six (6) discrete outputs, one (1) analog input, and one (1) analog output.

F. The level controller shall be capable of accepting the following inputs as a minimum:

   - Pump 1, 2 running or disabled (selectable)
   - Pump 1, 2 seal failure

- Pump 1 2 overtemperature
- High level float
- Alarm horn silence/reset

G. The level controller shall provide outputs for pump activation and alarms. Outputs shall be contact closures rated for 250VAC @ 3 amps. The level controller shall be capable of providing the following outputs as a minimum:

- Pump 1, 2 call
- Common alarm (i.e., horn and/or light)
- High level
- Low level

H. The level controller shall monitor a 4-20 ma input signal representing the process variable, and shall have 14-bit resolution (or higher). The controller shall include a 24VDC power supply for powering an external loop-powered transmitter, and shall provide a 4-20 ma output that is scalable to reflect the process level. The output resolution shall be fully scalable and not less than 12 bit.

I. Wet well level control shall be provided as follows:
1. When the level in the wet well rises to the “lead pump start” set point, the lead pump shall be started. If the capacity of the lead pump is greater than the influent flow, the lead pump shall stop when the wet well drops to the “lead pump stop” set point.
2. If the capacity of the lead pump is less than the influent flow, the lag pump shall be called to start when the wet well level reaches the “lag pump start” set point. If the capacity of both pumps running in parallel is greater than the influent flow, the lag pump shall stop with the wet well level falls to the “lag pump stop” set point. The lead pump, however, will continue to run.
3. If the capacity of the lead pump is greater than the influent flow, it shall stop when the levels falls to the “lead pump stop” set point. The pumps shall alternate after each complete operating cycle, if alternation is enabled.

J. The level controller shall have a built-in intuitive menu structure that allows quick and easy navigation and access to system data, status and adjustment of operator-configurable parameters for system automation. The controller shall limit operator adjustments to only the active components of the system. The controller shall allow system viewing and configuration of the following status and parameters:
1. When editing alteration, the display shall show only the active pumps to prevent sequencing of unavailable pumps. Alternation schemes shall include operator selection of a fixed pump sequence and/or automatic alternation mode to equalize pump wear. The alternator shall also have the capability of being put into a fixed sequence mode at any time.
2. When editing the level set points, the display shall show the available level range to prevent adjustments outside the operating range of the systems. The controller shall allow the operator to establish pump on/off level set points for each active stage (lead and lag pump), as well as high and low level alarm levels desired.
3. The level controller shall monitor and accumulate the following data:

- Starts for each pump (operator resettable to zero)
- Elapsed run time for each pump
- High level alarm occurrences (resettable to zero)

- Low level alarm occurrences (resettable to zero)
- High level/backup float alarm occurrences (resettable to zero)

4. The level controller shall allow for level simulation via the front panel display. The simulation shall allow the operator to simulate wet well level and verify that operating parameters are working as intended and programmed.
5. The level controller shall allow for configuration of the process variable input received from the external level/pressure transmitter. The controller shall allow the following operator adjustments:

    - Allowable transducer range shall be not less than 0-999.0
    - The process input shall be viewable as inches, feet, or PSI
    - Level offset shall allow the operator to compensate for the actual transducer/level transmitter placement, with an allowable range of not less than 0-999.9

6. The controller will allow for operator selection of pump up (fill) or pump down (empty) modes of operation.
7. The controller shall be operator-configurable to limit the number of pumps allowed to operate at one time.
8. Pump on delay adjustment (0-250 seconds) shall allow for the time between pump starts. The set time shall provide staggered starting of the pumps based on the set time. Setting the time to zero will allow all pumps to turn on at the same time when required by level input.
9. Pump off delay adjustment (0-250 seconds) shall allow for the time between pump stops. The set time shall provide staggered stopping of the pumps based on the set time. Setting the time to zero will allow all pumps to turn off at the same time when required by level input.
10. Set point dwell time adjustment (0-99 seconds) shall be provided to prevent nuisance pump operation or alarm activation based on momentary fluctuations of the input signal, or to allow for temporary process variable swings from affection system operation.
11. Motor/pump failure to start dely shall be provided and shall be operator-adjustable (0-99 seconds). This parameter shall be active when the level controller is monitoring eternally produced pump/motor run signals. When active, the controller shall determine pump failure to start when the external run input is not present after the adjustable time delay. If the motor fails, an alarm shall be produced and displayed.
12. A station data display shall be provided, allowing operator entry of the station's basic design parameters. As a minimum, the following parameters shall be displayable:

    - Pump horsepower
    - Pump voltage
    - Pump full load amperage
    - Tank (wet well) diameter, if applicable

K. The level controller shall monitor pump status and alarms as follows:
    1. The level controller shall allow for monitoring of external switches indicating "pump run" or "pump disable". The function shall be operator-selectable.
        a. In the "run feedback" selection, the controller shall use this input for monitoring "motor start" and determining "motor failure to start" alarms. When activated, the operator-mounted pump run indicator light shall be illuminated.
        b. In the pump disable mode, the controller shall prevent the associated pump from running.

2. The controller shall monitor pump seal failure. The input shall detect a contact closure from an external pump protection module or be able to monitor the seal probes directly. When active, an alarm shall be produced, but the motor shall continue to operate.
   a. The seal fain monitoring shall be operator-selectable for normal or inverted operation.
3. The level controller shall monitor pump/motor overtemperature. The input shall detect a contact closure input from an external source. When the overtemperature input is activated, an alarm shall be produced and the motor call signal shall be disabled until the condition is cleared.
   a. The level controller shall be configurable for automatic return to operation when the condition clears, or require manual reset before allowing the pomp./motor to restart.

L. The controller shall be provided with built-in diagnostics to facilitate on-site user troubleshooting. The controller shall support the following diagnostics:

- Digital input open/closed status
- Relay output on/off status
- Analog input raw input signal in mA
- Analog output signal in mA

M. Backup float switches (specified elsewhere in these Specifications) will be provided to initiate the backup control system. Float switch operating levels shall be field-set at elevations above the controller high level alarm set point.

N. The level controller shall operator on a 24VDC power source. Controller will be able to operate in an environment with 5-95% humidity non-condensing, and shall have a temperature operating range of not less than 0 - 122 degrees F.

O. One (1) spare level controller shall be provided as a spare, as outlined elsewhere herein. The local representative shall also maintain a stock of the specified level controllers for backup purposes.

2.7 SUBMERSIBLE TRANSDUCER

A. One analog submersible level transducer shall be supplied with each control panel. The transducer shall be designed to provide a 4-20 milliamp level signal proportional to the sensed liquid level in the wet well. The unit shall be sealed and non-fouling design, and shall be provided flush-mounted abrasion resistant Kynar diaphragm. One spare transducer/cable assembly shall be provided as a spare part.

B. The submersible hydrostatic level transducer shall be provided with a 2.75" diameter elastomeric diaphragm and protective cage specifically designed to meet adverse environments encountered in wastewater applications. The transducer shall feature a wide sensing area comprised of a PTFE coated elastomeric diaphragm for reliable operation in highly viscous or slurry environments. The assembly shall be integrated with all required supporting electronics mounted within a durable waterproof housing constructed of welded 316 stainless steel or titanium.

C. Polyurethane or Tefzel electrical cable shall be provided, manufactured to MEAS specifications, and shall include Kevlar members to prevent errors due to cable elongation, as well as a unique water block feature that self-seals in the event of accidental cuts to the cable. The transducer shall be vented to atmosphere by means of tubing contained within the included cable, and shall be shipped with the manufacturer's latest-design super-dry vent filter that prevents moisture from entering the vent tube for a minimum of one year without maintenance, even in the most humid environment. Spare vent filters shall be provided as specified herein.

D. Adequate cable shall be provided to allow installation of the transducer without need for splices in the cable between the wet well and the control panel location. Excess transducer cable shall be neatly coiled in the bottom of the control panel enclosure, and under no circumstances shall transducer cables be cut off in the field.

E. A built-in lightning arrestor shall be included to provide protection against transient voltage spikes. Lightning-protected models shall include both internal and external panel-mounted devices for maximum protection against surges, spikes and lightning. The transducer shall be provided with a two year warranty against defects in materials and/or workmanship.

F. The transducer shall be a non-fouling design, and shall be provided with a wide-mouth protective cage to prevent damage to the diaphragm by debris in the wastewater. The cage shall also be constructed of 316 stainless steel or titanium, and shall include spacers and a lower protective plate for protection of the sensing element and diaphragm. The transducer shall be capable of +/- 0.25% full scale static accuracy, and +/- 0.0001% full scale resolution, and shall be available in custom level ranges of up to 115 feet (35 meters). Level range provided shall be specifically selected for this project, based on the wet well depth as shown on the Plans.

G. Analog output from the transducer shall be 4-20 mA. Excitation voltage shall be provided by the level controller specified herein, and the transducer and controller shall be matched to provide for accurate, repeatable operation for years. Operating temperature range shall be from -4 to +140 degrees Fahrenheit.

H. An aneroid bellows constructed of flexible neoprene material shall be attached to a polycarbonate mounting bracket inside the control panel enclosure, and shall be properly applied to result in a closed reference pressure system subject to zero shift errors induced by changing temperatures of up to 0.003 PSI per degree Celsius. One spare bellows shall be provided as a spare part.

I. A woven wire cable hanger shall be provided by the transducer manufacturer to allow suspension of the transducer in the wet well. The hanger shall be fabricated of 316 stainless steel, and shall provide a looped connection to suspend the transducer. Hanger shall be a regular production and cataloged item of the transducer manufacturer, and shall be specifically designed for use with the specified equipment.

J. One spare transducer/cable assembly and one spare bellows shall be provided as spare parts.

2.8 MANUFACTURER'S WARRANTY

A. The pump and control manufacturers shall warrant the equipment provided to be of the highest quality and construction, free of defects in material and workmanship. A written warranty will be provided for all equipment, and shall indicate specific parts and labor covered.

B. New equipment shall be warranted for a period not to exceed twelve (12) months from the date of substantial completion of the overall contract regardless of the date of initial startup and/or beneficial use, but not to exceed eighteen (18) months after the date of shipment. Warranty shall cover all parts of the equipment furnished, excepting only those items that are normally consumed in service, such as oil and grease, packing, gaskets, O-rings, etc...
   1. It is not intended that the equipment manufacturer assume liability for any consequential damages or contingent liabilities arising from the failure of any product or parts thereof to operate properly, however caused; whether by or resulting from or arising from any defects in design or manufacture, delays in delivery, replacements or otherwise.
   2. Components failing to perform as specified by the Engineer, or as may be represented by the manufacturer, or proven defective in service during the warranty period, will be replaced, repaired, or satisfactorily modified by the manufacturer without cost of parts or labor to the Owner.
   3. Equipment warranty shall become effective upon the acceptance by the purchaser or the purchaser's authorized agent, or sixty (60) days after installation, or ninety (90) days after shipment, whichever occurs first.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Contractor shall off-load equipment at installation site using equipment of sufficient size and design to prevent injury or damage. Equipment manufacturers shall provide written instructions for proper handling of the equipment. Immediately after off-loading, contractor shall inspect all equipment and appurtenances for shipping damage or missing parts. Any damage or discrepancies shall be noted in written claim form with the shipper prior to accepting delivery. Validate all serial numbers, etc... with the shipping documentation. Notify the manufacturer's representative of any unacceptable conditions noted with shipper.

3.2 INSTALLATION

A. The contractor shall install, level, align, and lubricate the pump, controls, piping, and related equipment as indicated on project drawings or outlined in the manufacturer’s O&M manuals. Installation must be performed in strict accordance with the written instructions supplied by the manufacturer at time of delivery.

B. Check motor and control data plates for compatibility to site voltage. Install and test the station ground prior to connecting line voltage to station control panel.

C. Prior to applying electrical power to any motors or control equipment, check all the wiring for tight connections. Verify that protective devices (fuses & circuit breakers) conform to project design documents. Manually operate all of the circuit breakers and switches to ensure operation without binding. Open all circuit breakers and disconnects before connecting utility power. Verify line voltage, phase sequence and ground before actual start-up.

3.3 FIELD QUALITY CONTROL

A. Prior to acceptance by Owner, an operational test of the pump, and control system shall be conducted to determine if the installed equipment meets the purpose and intent of the Specifications. Tests shall demonstrate that all equipment provided (1) is electrically, mechanically, structurally, and otherwise acceptable, (2) is safe and in optimum working condition, and (3) conforms to the specified operating criteria.

B. After construction debris and foreign material has been removed from the wet well, contractor shall supply clear water volume adequate to operate the pump and verify suitability for service. Observe and record operation of pump, including discharge gage readings, ampere draw, pump controls, and any other related measurements. Check calibration of all instrumentation equipment, test manual control devices, and automatic control systems. Be alert to undue noise, vibration or other operational problems.

C. Coordinate system start-up with the manufacturer's technical representative. The representative or factory service technician will inspect the completed installation, calibrate and adjust instrumentation, correct or supervise correction of defects or malfunctions, and instruct operating personnel in proper operation and maintenance procedures.

3.4 CLEANING

A. Prior to acceptance, inspect the equipment provided for dirt, splashed material or damaged paint. Clean or repair accordingly. Remove from the job site all tools, surplus materials, scrap and debris.

3.5 PROTECTION

A. The transfer station shall be placed into service immediately after startup by the manufacturer’s representative. If operation is delayed, equipment is to be stored and maintained per manufacturer's written instructions.

END OF SECTION 33 32 19.32

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SECTION 33 32 21 – RETURN SLUDGE PUMP STATION

PART 1 - GENERAL

1.1 SCOPE

A. This specification governs the pumps for the New Return Sludge Pumping Station at the Brundidge Wastewater Treatment Facility.

1.2 WARRANTY

A. The pump manufacturer shall warrant the pump, motor, and guide system to the Owner for a period of seven (7) years under normal use and service. A copy shall be provided to the Owner at startup.

PART 2 - PRODUCTS

2.1 GENERAL PERFORMANCE REQUIREMENTS

Design Operating Condition	520 GPM @ 12’ TDH
Maximum Motor HP	5.5 HP
Maximum Motor RPM	1200 RPM

2.2 MATERIALS

A. SUBMERSIBLE SEWAGE PUMPS

Pump Case: Cast Iron, ASTM A48, Class 35B

Motor Housing: Cast Iron, ASTM A48, Class 35B

Impeller: Cast Iron, ASTM A48, Class 35B

Intermediate Housing (Backplate): Cast Iron, ASTM A48, Class 35B

Discharge Base Elbow: Cast Iron, ASTM A48, Class 35B

Pump/Motor Shaft: Carbon Steel, ASTM A576, Gr.1045 with replaceable ASTM A276 Type 420 shaft protection sleeve. (NOTE: If sleeve is not supplied, entire shaft is to be ASTM A276 Type 420 stainless steel)

Shaft Sleeve (if used): Stainless Steel, ASTM A276 Type 420

Wear Ring, case: Cast Iron, ASTM A48, minimum 200 Brinell

Wear Ring, impeller (enclosed impellers only): Stainless Steel, AISI329, 350 Brinnel

O-Rings: Nitrile Rubber (NBR)

Fasteners (including impeller fastener): Stainless Steel, ASTM A276 Type 316Ti.

Lower Seal Faces: Silicon Carbide/Silicon Carbide

Upper Seal Faces: Silicon Carbide stationary/Carbon rotating

Guide rails/cables and mounting brackets: Stainless Steel, ASTM A276 Type 316 (cables shall be nylon coated)

Lifting Chain or cable: Stainless Steel, ASTM A276 Type 316

Oil-all uses (seal lubrication, etc): Ecologically safe, parifin or mineral base

Power/Control Cable Jacket: Chloroprene with non-wicking fillers

2.3 ACCESSORIES

A. POWER CABLE
1. Provide 25 ft of power/control cable with each pump, suitable for submersible wastewater application, sized in accordance with NEC requirements. Provide cable terminal box on side of motor housing, with cable entry sealed to insure that no entry of moisture is possible into the high-voltage motor/ terminal area even if the cable is damaged or severed below water level. Cable seal shall include a compressed rubber grommet to seal the cable exterior and epoxy fill to seal the interior passages. A strain relief device, in direct contact with both the cable and the cast iron entry housing, shall be provided. The cable entry shall be rated by Factory Mutual (or UL) for submerged operating depths to 85 feet.

B. TEMPERATURE PROTECTION
1. Furnish temperature monitoring devices in motor windings for use in conjunction with and supplemental to external motor overload protection. Arrange controls to shut down pump should any of the monitors detect high temperature and automatically reset once motor temperature returns to normal. Set temperature monitors at levels recommended by pump manufacturer

C. SEAL LEAK DETECTION
1. Provide a detector in the motor's stator cavity which allows a control panel mounted relay to indicate leakage into the motor. In addition, on motors 80HP and larger provide a stainless steel float switch in a separate leakage collection chamber to indicate leakage past the inner mechanical seal prior to its entrance into either the motor stator cavity or the lower bearing. Electronic probes which depend on sensing resistance value changes in seal oil will not be acceptable as seal leak indicators.

D. "PumpSafe" MOTOR SENSOR MONITORING RELAY

1. The pump supplier shall furnish all relays required for monitoring all motor sensors. The relays shall be installed by others in the motor control panel and properly wired in accordance with pump manufacturer's instructions. Relays shall mount in standard 12-pin socket bases (provided) and shall operate on available control voltage of 24-240 VAC. If relays require an input voltage that is not available in the motor control panel an adequate transformer (with fused input) shall be provided by the pump supplier. Relays shall have a power consumption of no more than 2.8 watt, and shall be UL approved. Relays shall be modular in design, with each relay monitoring no more than two motor sensor functions.
2. Each relay module shall include a dual color (red/green) LED to indicate the status of each monitored sensor. Green will indicate "status OK"; red will indicate a failure or alarm condition. A self-corrected fault will allow the relay output contacts to reset, and cause the LED to change from a steady alarm indication to a flashing signal. The LED shall continue to flash until locally cleared, providing the operator an indication of a potential intermittent fault. Each relay shall also include a power-on LED and both "test" and "reset" pushbuttons.
3. An independent fail-safe (switch on power loss) form-C output contact shall be included for each monitored sensor to provide a normally-open / normally-closed dry contact to initiate a remote alarm device or shut down the motor. Contacts shall be rated for 5 amps at 120 volt.

2.4 FABRICATION

A. GENERAL

1. Provide pumps capable of handling raw unscreened wastewater. Design pumps to allow for removal and reinstallation without the need to enter the wet well and without removal of bolts, nuts or other fasteners.
2. Provide a pump which connects to a permanently mounted discharge connection by simple downward motion, without rotation, guided by at least two non-load-bearing guides. All system components for guide cable systems, including cable, shall be supplied and warranted by the pump manufacturer. For guide pipe systems the pipe shall be supplied and warranted by the installing contractor. Guide cable systems shall be suitable for proper operation when installed at up to 5 degree misalignment from vertical, pipe guides must be installed perfectly plumb and vertical. Intermediate guide supports (between upper bracket and discharge elbow connections) shall not be required for cable systems but MUST be supplied where needed to maintain perfect alignment for pipe guides. Final connection shall ensure zero leakage between pump and discharge connection flange. Provide a discharge connection/ guide system so that no part of the pump bears directly on the floor of the wet well. Provide Type 316 stainless steel chain of sufficient length to properly and safely lift pumps from the wet well. All exposed cast iron and ferrous surfaces shall be cleaned of dirt and grease, sandblasted to near white finish, and coated with an anti-corrosion reaction primer. The pump shall then be coated with two-component thick coat paint, with an epoxy resin base, having at minimum 83% solids by volume. This coating shall be non-toxic and approved for both wastewater and water applications.

B. MAJOR COMPONENTS

1. Furnish major components (pump case, impeller, intermediate housing, motor housing) of cast material as specified with smooth surfaces devoid of blow holes and other

irregularities. Pump case design shall incorporate a centerline discharge for stability when mounted on the base elbow.

C. IMPELLER AND WEAR PLATE

1. The non-clog impeller design shall combine the action of a centrifugal, open, single vane and the capabilities of a positive displacement screw pump. The impeller shall provide gradual acceleration along with a gentle change in flow direction resulting in low shear stress of the pumped media. The impeller shall be suited for high efficiency pumping of both municipal and industrial wastewater. It shall be capable of handling coarse textile type solids with a minimum 3 " solids passage, as well as sludge up to a 13% dry weight solids content. The impeller leading edges shall pass across a helical groove, located on the wear ring, to provide a self-cleaning action to free the surface of solids and fibers with each rotation of the impeller. The impeller shall be a one piece casting of the material specified. It shall be smooth, well finished, free from blowholes and imperfections, and be balanced for the duty point. The impeller leading edges shall be hardened to a minimum 450 Brinell hardness (Rc 47). The impeller shall be securely fitted to the pump shaft in such a manner that it does not loosen or become detached if the pump is operated in the wrong direction as my happen by reversed flow or reversed motor connections. A hard metal suction wear ring shall be provided that is externally adjustable to compensate for wear, of the material specified.

D. SHAFT

1. Provide common pump/motor shaft of sufficient size to transmit full driver output with a maximum deflection of 0.002 inches measured at the lower mechanical seal. Machine the shaft of carbon steel (for maximum strength and motor efficiency) and isolate the shaft from the pumped media with a replaceable Type 420 stainless steel shaft sleeve under the lower mechanical seal. Do not use carbon steel as shaft material without a stainless steel sleeve. If a sleeve is not used, machine the entire pump/motor shaft of ASTM A276 Type 420 stainless steel

E. SHAFT SEAL

1. Provide two totally independent mechanical shaft seals, installed in tandem, each with its own independent single spring system acting in a common direction. Install the upper seal in an oil-filled chamber with drain and inspection plug (with positive anti-leak seal) for easy access from external to the pump. Provide seals requiring neither routine maintenance nor adjustment, but capable of being easily inspected and replaced. Provide seals which are non-proprietary in design, with replacements available from a source other than the pump manufacturer or its distributors. Do not provide seals with the following characteristics: conventional double mechanical seals with single or multiple springs acting in opposed direction; cartridge-type mechanical seals; seals incorporating coolant circulating impellers, seals with face materials other than those specified

F. BEARINGS

1. Furnish upper and lower bearings, single row (preferred) or double row as needed to provide a B10 life of, at minimum, 100,000 hours at all anticipated axial and radial loadings. Provide sealed/shielded (permanently lubricated) bearings .If open-type (non-shielded) bearings are used, provide re-lubrication ports with positive anti-leak plugs for periodic addition of lubrication from external to the pump.

G. MOTOR

1. Provide a motor which is squirrel cage, induction in design, housed in a completely watertight and air filled chamber, with a min 1.15 service factor. The motor shall be adequately sized and rated for continuous operation at a maximum fluid temperature of 104º F (40º C) [optional: 140ºF (60º C)]. Allowable maximum submergence shall not be less than 100ft (30 m). The motor stator shall be wound using Class H monomer-free polyester resin insulation resulting in an overall motor rating of 311 Degrees F (155 degrees C), Class F insulation. The stator windings shall be trickle impregnated resulting in a winding fill factor of at least 95%. The use of a multiple step "dip and bake" type stator insulation method shall not be acceptable. The rotor bars and short circuit rings shall be made of aluminum. The motor and pump set complete shall be designed and manufactured by the same company. Provide temperature protection and seal leak detection as described in section above. Provide adequately rated motor with sufficient surface area for ambient only cooling suited for the intermittent mode of operation in wet well wastewater applications, submerged or partially submerged, without damage. Motors containing di-electric oils used for motor cooling and/or bearing lubrication or motors where the pumped media or externally provided fresh water is directed through the motor shell for cooling are not acceptable.
2. Provide motors which are FM listed for use in Class I Division 1 Groups C&D hazardous locations as defined by the National Electric Code.

2.5 MANUFACTURER

A. Return Sludge Pumps shall be KSB Model KRT D 150-253/76X-EG-S1E3 or equal by Hidrostal, Vaughn, or equal.

2.6 RAS PUMP CONTROL PANEL

A. One (1) RAS 5.5HP Duplex Pump Control Panel to have the following features:
1. The control panel shall be designed, assembled, tested and labeled UL508a for industrial control panels. The control panel shall be NEMA-4X 304 stainless steel construction with sub-panel and swing-out dead-front inner door. The control panel shall be designed for operation of the RAS Pumps Danfoss Variable Speed Drives (VFDs). Panel shall include heat pipe heat exchanger with fan for enclosure heat dissipation.

B. Incoming power will feed an appropriately sized main circuit breaker determined by incoming power available fault current and control panel system loading. All control operator devices will be mounted on the inner door. Control Panel to have surge protection and phase monitoring protection. The main circuit breaker will feed two motor branch circuit protectors for the variable speed drives. Control panel shall include a properly sized control power transformer with appropriate primary and secondary protection, to provide control power for system control voltage. Controls for motors shall include a PLC or other suitable pump controller, a relay-float bypass contactor backup system with "On" & "Off" levels and will include the two backup level floats. For each motor there will be a seal and thermal protection relay, a Hand-Off-Auto selector switch, a Green "Run" pilot light, a Red "Stop" pilot light, an Amber "VFD Fault" pilot light, an Amber "Motor Thermal Fail" pilot light, an Amber "Seal Fail" pilot light, and Amber "Backup Float HI" & "Backup Float LOW" pilot lights. An external enclosure top-mounted red flashing alarm beacon shall be included for a motor fault and/or high-level conditions.

C. The control system shall operate via Hand-Off-Auto Selector Switches as follows:
   1. In “Hand” position the VFD will run at an adjustable speed configured by the operator to best match clarifier manual valve throttling output. Pump will cease operation at low level point. Alternation will occur each start/stop cycle or based upon 24 hours of continuous operation.
   2. In “Auto” position the VFD will run at a speed directly proportional to and linear with wetwell level. Controller will shut off pumps at minimum level while alarming at high level. Alternation shall be selectable number of continuous hours to equalize pump run time. Alternation will occur also if pumps shut off on low level prior to the next start.

D. There shall be a set of Backup (HI & LOW) Float Switches that will perform pump-down operation in the case of level transmitter failure. Timer function shall allow selectable intermittent operation in backup float mode. In this case the ON float would start the VFD at a preset speed (likely hand setting) and run until the OFF float drops out thereby stopping the VFD.

E. 1 Set of Spare parts shall include:
   1. 5.5 HP Danfoss VFD
   2. PLC or Level Controller

PART 3 - EXECUTION

3.1 EXAMINATION

A. Contractor shall off-load equipment at installation site using equipment of sufficient size and design to prevent injury or damage. Equipment manufacturers shall provide written instructions for proper handling of the equipment. Immediately after off-loading, contractor shall inspect all equipment and appurtenances for shipping damage or missing parts. Any damage or discrepancies shall be noted in written claim form with the shipper prior to accepting delivery. Validate all serial numbers, etc... with the shipping documentation. Notify the manufacturer's representative of any unacceptable conditions noted with shipper.

3.2 INSTALLATION

A. The contractor shall install, level, align, and lubricate the pump, controls, piping, and related equipment as indicated on project drawings or outlined in the manufacturer’s O&M manuals. Installation must be performed in strict accordance with the written instructions supplied by the manufacturer at time of delivery.

B. Check motor and control data plates for compatibility to site voltage. Install and test the station ground prior to connecting line voltage to station control panel.

C. Prior to applying electrical power to any motors or control equipment, check all the wiring for tight connections. Verify that protective devices (fuses & circuit breakers) conform to project design documents. Manually operate all of the circuit breakers and switches to ensure operation without binding. Open all circuit breakers and disconnects before connecting utility power. Verify line voltage, phase sequence and ground before actual start-up.

3.3 FIELD QUALITY CONTROL

A. Prior to acceptance by Owner, an operational test of the pump, and control system shall be conducted to determine if the installed equipment meets the purpose and intent of the Specifications. Tests shall demonstrate that all equipment provided (1) is electrically, mechanically, structurally, and otherwise acceptable, (2) is safe and in optimum working condition, and (3) conforms to the specified operating criteria.

B. After construction debris and foreign material has been removed from the wet well, contractor shall supply clear water volume adequate to operate the pump and verify suitability for service. Observe and record operation of pump, including discharge gage readings, ampere draw, pump controls, and any other related measurements. Check calibration of all instrumentation equipment, test manual control devices, and automatic control systems. Be alert to undue noise, vibration or other operational problems.

C. Coordinate system start-up with the manufacturer's technical representative. The representative or factory service technician will inspect the completed installation, calibrate and adjust instrumentation, correct or supervise correction of defects or malfunctions, and instruct operating personnel in proper operation and maintenance procedures.

3.4 CLEANING

A. Prior to acceptance, inspect the equipment provided for dirt, splashed material or damaged paint. Clean or repair accordingly. Remove from the job site all tools, surplus materials, scrap and debris.

3.5 PROTECTION

A. The transfer station shall be placed into service immediately after startup by the manufacturer’s representative. If operation is delayed, equipment is to be stored and maintained per manufacturer's written instructions.

3.6 CONTROL PANEL INSTALLATION NOTES

A. All conduit connections shall be watertight.

B. All exposed conduit shall be metallic conduit or sealtite flexible conduit.

C. All control panels shall be mounted on a rigid metal structure.

D. VFD power, motor leads, and control wiring shall be run in separate conduits.

E. All field wiring shall be minimum #14AWG 90degC THHN.

END OF SECTION 33 32 21

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SECTION 33 35 00 - SEWER SERVICE CONNECTIONS

PART 1 - GENERAL

1.1 DESCRIPTION

A. The work covered by this section consists of furnishing and installing service connections in the sewers, and connecting to existing service lines.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 33 05 51 - Ductile Iron Pipe and Ductile and Cast Iron Fittings

B. Section 33 31 13.01 - Polyvinyl Chloride (PVC) Sewer Pipe and Service Pipe

PART 2 - PRODUCTS

2.1 SERVICE CONNECTIONS

A. Service connections shall be made at the top or from the side at 45° of the sewer line using 4" and/or 6" diameter pipe as shown on the plans or as required in the field. Service pipe shall be of the same material and quality as the main sewer line.

B. The service connection shall extend from the sewer line to the right-of-way and be tied-in to existing service line there, where existing service exists. Connection to existing service line shall be by means of Fernco Flexible Couplings.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Existing service lines shall be kept in service during construction of new sewer main. After new line has been installed, tested, and accepted, all service lines shall be connected to the new sewer line.

B. Laying of service connection lines shall be in accordance with specifications covering pipe laying as detailed in Section 33 31 13.01 or 33 31 13.03 of these specifications.

END OF SECTION 33 35 00

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SECTION 40 05 51 - VALVES

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section contains general information required to furnish and install valves and related components.

B. Related Work Specified Elsewhere:
   1. Section 33 05 51 - Ductile Iron Piping & Ductile Iron & Cast Iron Fittings

1.2 SUBMITTALS

A. Submit product data sheets showing materials, operating characteristics, construction, and dimensions on all proposed valves and associated components in accordance with Section 01 33 00.

1.3 QUALITY ASSURANCE

A. The supplier of all valves and accessories furnished under this section shall be responsible for all coordination between valves and actuators and other accessories to provide properly operating valves.

PART 2 - PRODUCTS

2.1 GATE VALVES

A. Resilient Seat: Resilient seat gate valves shall be single solid wedge disc type with the disc fully encapsulated with a resilient rubber seat. The stem nut shall be integrally cast and the stem shall ride on an antifriction washer. The inside of the valve shall be fusion bonded epoxy coated complying with AWWA C550 and applied prior to assembly. The valve shall be certified to provide zero leakage at 200 psi. Valve shall meet AWWA Specification C-509 or C-515.
   1. Unless otherwise specified or shown on the drawings, valves shall have mechanical joint bell connections.

B. Double Disc (AWWA C500): All double disc valves, whether main line valves or auxiliary valves for fire hydrant leads, shall meet AWWA Specifications. Valves shall be iron body, bronze mounted, double disc, parallel seat, non-rising stem with "O" ring seals, 200 lbs. working pressure with 400 lbs. hydrostatic test for sizes 2 inches through 12 inches, and 150 lbs. working pressure with 300 lbs., hydrostatic test for sizes 14 inch through 30 inch.

C. Tapping Valves and Tees: Tapping valves shall meet the requirements of AWWA C-509 or C-515 gate valves indicated above and be designed for making taps to existing mains under

pressure. Valves, tees, and boring equipment used shall be mutually compatible. Tapping tees unless otherwise indicated shall be constructed of cast or ductile iron with non-corrosive accessories.

1. All stainless steel fabricated tees may be used when indicated or directed by the engineer. All nuts and bolts shall be noncorrosive and be compatible with fitting materials.

D. Gate Valves 2" and Smaller:
1. Valves shall be all brass or bronze construction, screwed type, with union bonnet, rising stem, suitable for 150 pounds working pressure. Valves shall be Nibco 135 or equal.

E. Gate Valves 20" and Larger: Valves 20" and larger shall be equipped with level or spur gearing as required by the valve orientation.

2.2 VALVE BOXES

A. Cast iron valve boxes shall be provided on all buried valves and shall consist of a base covering the operating nut and valve head, an adjustable vertical shaft at least 5-1/4 inches in diameter and a top section extending to a point even with the finished ground surface, provided with a cast iron cover placed concentrically over the operating nut.

2.3 SWING DISC TYPE CHECK VALVES

A. Swing disc type check valves shall meet AWWA Specification C-508 and shall be a full clear port design of flanged or mechanical joint construction as indicated. The valve shall be iron-body with bronze disc ring and seat ring, fully bronze mounted stainless steel hinge pin, spring loaded outside lever, for 150 psi working pressure. The disc shall be revolving to equalize wear and shall be designed so that the disc cannot hang or stick in the open position on reversal of flow. The convertible spring loaded external lever arm shall be adjusted to prevent shock when flow is stopped. The design shall allow for removal of parts from the top of the valve.

2.4 PRESSURE SUSTAINING/PRESSURE REDUCING VALVE (2.5” AND LARGER)

A. The pressure reducing valve shall maintain a constant downstream pressure regardless of fluctuations in demand between the limits indicated in the plans, and close drip tight when downstream pressures reach the setting.
1. The basic pilot controlled valve shall be low loss hydraulically operated diaphragm actuated globe or angle pattern valve as indicated on the plans.
2. The main valve shall have a single removable seat and a resilient disc. The stem shall be guided at both ends by a bearing in the valve cover and an integral bearing in the valve seat. No external packing glands are permitted, and there shall be no pistons operating the main valve or any pilot controls. The valve shall be of flanged cast iron construction rated for minimum 200 PSI working pressure. The valve trim shall be bronze. The disc shall be nylon-reinforced BUNA-N Rubber. All necessary repairs including seat replacement shall be possible without removing the valve from the line. All pilot inlets shall be equipped with straight self-cleaning screens. All pilot lines shall have isolating cocks valves.
3. The pilot control shall be a direct-acting, adjustable spring-loaded, normally open diaphragm valve which closes when downstream pressure exceeds the spring setting.

4. The pilot valves shall be equipped with opening and closing speed controls.
5. The valve shall be a similar and equal to a Clayton Model 690-01.

2.5 PRESSURE GAUGES

A. Pressure gages shall be a 4½ inch industrial grade gage, temperature compensated with a 1% full scale accuracy. The tube shall be constructed of phosphor bronze and the socket shall be brass. Connection shall be made by ¼-inch NPT male fitting. The gage shall have a 0-200 psi range with scales for 1-200 psi unless otherwise indicated. A snubber shall be furnished to provide steady state pressure readings and a brass and/or stainless steel ball valve shall be installed at the mainline connection.

2.6 SILENT TYPE CHECK VALVES

A. The silent type check valves shall be a single disc type with a semi-steel body, bronze trim and a stainless steel spring and bushing, flanged and drilled per ASME B16.1 with 150 psi bolt circle. The valve shall be center guided and shall have a resilient seat. The valve shall be center guided and shall have a resilient seat. The flow area shall be approximately 10 percent greater than the pipe size. The valve shall be designed to open at 1/4 to 1/2 PSI and close completely while there is still a positive head on the discharge side at approximately 1/2 PSI. The valve shall be as manufactured by APCO (600 Series), Val-Matic or approved equal.

2.7 RUBBER SEATED BUTTERFLY VALVES FOR BURIED SERVICE

A. General: Butterfly valves shall have one piece, ductile iron bodies and shall be mechanical joint unless shown otherwise on drawings.

B. Valve Bodies and Joints: Valve bodies shall be constructed of ductile iron and shall have integrally cast mechanical joint ends.

C. Valve Discs: The disc seating edge shall be full radius polished for proper seating with the valve seat. The disc shall be ductile iron and shall be securely attached to the valve stem in such a way that it is easily field removable. The disc stems shall be 316 SS and shall have seals to prevent leakage. O-ring seals are not acceptable.

D. Valve Shafts: Shafts of all valves shall be turned, ground and polished. Valve shafts shall be constructed of Type 304 stainless steel. Shaft diameters must meet torsional requirements established by AWWA Standard C504-74.

E. Valve Seats: The seat shall be constructed either by bonding a resilient elastomer inside a rigid plastic backing ring which is slip-fitted in the valve body or molded in and vulcanized to the body. Seat shall be field replaceable without disassembly of the disc and shaft. The seat shall be Buna-N.

F. Valve Stem Extension and Nut Operator: All valves are to be mounted with the stem in the horizontal position. Weatherproof gear operators are to be supplied on all valves. Gear operators are to be directly mounted to valve neck and supplied with operating nut at ground level.

G. Painting: All surfaces of the valve shall be clean, dry and free from grease before painting. The valve interior and exterior surfaces, except for the seats, shall be coated with 10 mil epoxy. A rubber lining vulcanized to the body is also acceptable.

H. Testing: Each valve and actuator shall be assembled, adjusted, and tested as an unit by the valve manufacturer. Valves with actuators mounted outside of the valve manufacturing facility are not acceptable. Shop leakage tests shall be performed at the factory and follow the requirements of AWWA C504 except that the test pressure shall be 225 psi.

I. Manufacturer: Valves shall be Demco Series NF, DeZurik, Pratt or equal.

2.8 KNIFE GATE VALVES

A. Knife gate valves shall be full bore (according to Schedule 40 pipes) directional, wafer type drilled and tapped to ANSI 125 pound standard and rated for 150 psig working pressure.

B. The body shall be cast iron with 316 stainless steel gate seat retaining ring and packing gland. Packing shall be asbestos free braided packing. The floating stem nut shall be corrosion resistant low friction nickel-bronze. The resilient valve seat shall be EPDM.

C. The valve shall be of a non-rising stem configuration handwheel operated with a stainless steel stem fully supported at top and bottom. The bottom bushing shall be bronze and the top shall have a greasable needle thrust bearing. The stem assembly shall be rigidly supported by four steel support bars or other equally rigid support system.

D. The gate shall have rounded edges and pointed bottom edge riding on and across a replaceable resilient seat. The resilient seat shall be held in place with a stainless steel ring designed so that the valve can be easily repaired in the field.

E. All knife gate valves shall be an "SBU" Type MV, or equal.

2.9 PLUG VALVES

A. Valves shall be non-lubricated, eccentric type with resilient faced plugs, and ends as shown on the drawings or specified. Bodies shall be ASTM A126 Class B cast iron with raised seats. Seats shall have a welded-in overlay of not less than 90% pure nickel on all surfaces containing the plug face. Resilient plug facings shall be of neoprene. Valves through 20" shall have stainless steel permanently lubricated upper and lower plug stem bushings. Valves 24" and larger shall have permanently lubricated stainless steel upper and lower plug stem sleeves and bronze bushings. Stem bushings with "O" rings are not acceptable on any size. Packing on all valves shall be adjustable. Packing on lever operated valves shall be the low-friction type. All exposed nuts, bolts, springs, and washers shall be zinc plated. Valves shall be designed for 150 lbs. working pressure.

B. All manually operated valves, 6-inch and smaller shall be equipped with lever actuators unless shown otherwise. All manually operated valves 8 inch and larger shall be equipped with gear actuators and hand-wheels. All gearing shall be enclosed suitable for running in oil with seals provided on all shafts to prevent entry of dirt and water into the actuator. Construction of actuator housings shall be semi-steel. All exposed nuts, bolts, and washers shall be zinc-plated.

2.10 BALL VALVES (0.25” TO 2”)

A. Metal ball valves shall have a two piece brass body, with stainless steel ball and trim TFE bearing and packing, TFE teflon seats, zinc die cast handle with nickel finish and brass handle nut. Valves shall be similar to Jamesbury Series 3000.

B. PVC ball valves shall be two piece body construction of Type I PVC with CPVC ball and stem, Teflon seats and viton stem seal.

2.11 WATER AIR RELEASE VALVES

A. Water air release valves shall be designed for releasing entrained air in water in lines under pressure. Direct acting valves may be used for pressure below 20 psi and compound lever valves shall be used on all valves when pressures exceed 20 psi. The valve body shall be cast iron and the float shall be stainless steel. Seats shall be BUNA-N and linkage for compound levers shall be bronze or delrin. All other internal parts shall be stainless steel or bronze. All valves shall be mounted with a gate valve to permit easy servicing. Water air release valves shall be as manufactured by APCO, Crispen, Val-Matic or GA.

2.12 PUMP AIR AND VACUUM VALVES

A. The pump air and vacuum valves shall be designed for use with vertical turbine pumps. They shall be constructed of cast iron with a Buna-N seat, stainless steel or bronze bushings, float guides and retaining screws. The valves shall be sized for the unloaded pumping rates of the associated pump. The valves shall be as manufactured by APCO, Val-Matic or Crispen.

2.13 SEWAGE AIR/VACUUM VALVES

A. Sewage air and vacuum valves shall be double float type valves with interconnecting stem designed for admitting and discharging large quantities of air. The body shall be cast iron with Buna N seat. Floats and stem shall be stainless steel. The stem guide shall be a replaceable extra long bronze sleeve mounted in a cast iron baffle. The valve shall be equipped with a shut-off valve of the same size as the air valve inlet, a 1" blow-off valve, a back flushing valve and flushing hose with quick disconnect couplings. The valve shall be short or long bodied as indicated in the plans or as space requirements permit. The valve shall be as manufactured by APCO, Crispen, or Val-Matic.

2.14 SEWAGE AIR RELEASE VALVE

A. Sewage air release valves shall be designed for releasing entrained air in lines containing raw sewage under pressure utilizing a compound lever design with a long float stem. The valve body shall be cast iron and the float and rod shall be stainless steel. Seats shall be BUNA-N and linkage levers shall be bronze or delrin. All other internal parts shall be stainless steel or bronze. Furnish a back-flushing valve and hose assembly with quick-disconnect couplings. Each valve shall be full-bodied or short-bodied as shown on the drawings or, if not shown, shall be full-bodied if space permits. All valves shall be mounted with a gate valve to permit easy servicing. Sewage air release valves shall be manufactured by APCO, Crispen, Val-Matic or GA.

2.15 SEWAGE SINGLE BODY COMBINATION AIR RELEASE AND AIR/VACUUM VALVE

A. Single body combination air vacuum air release valves shall be single body double orifice, short body valves with backflushing valve and hose accessories. The large orifice shall shut off without any spilling. The small orifice shall be ported through the large orifice and will open and close by single lever action whenever small amounts of air collect under pressure. The stainless steel float shall have a concave bottom for quick reaction from incoming fluids and for deflection of solids downward away from the openings. The valve shall be cast iron construction with all stainless float and linkage durlin or cast iron leverage frame and Buna-N seats. Furnish backflushing valve and hose with quick disconnect couplings. The valve shall be similar and equal to APCO 440 Series.

2.16 PRECAST REINFORCED CONCRETE MANHOLES FOR VALVES

A. Precast reinforced concrete manhole sections shall conform to ASTM Specifications C-478. All joints for precast sections shall be approved by the Engineer.
   1. Manhole frame and cover shall be cast iron conforming to ASTM A48 for Class 30 gray iron castings and shall not weigh less than 310 pounds, total. Frame and cover to be Vulcan Foundary No. VM-3MOD, Neenan Foundary No. R-1708 or U.S. Foundary No. 360-F.

2.17 TAPPING SADDLES FOR AIR RELEASE VALVES

A. Saddles shall be specifically sized for the O.D. of the pipe on which it is to be installed and shall be rated at a minimum of 250 psig. The body shall be equipped with a Buna-N rubber “O” ring gasket to produce a water tight seal. The saddle body shall be constructed of AWWA brass ASTM B62 with stainless steel accessories and straps. Saddles for PVC pipe shall be double-strap or double wide-strap design.

2.18 SOLENOID VALVES (0.25” THROUGH 2.5”)

A. Solenoid water valves shall be general purpose normally closed brass bodied valves. Seals and discs shall be Buna "N", disc holder shall be nylon, core tube shall be stainless steel, core and plug nut shall be 430F stainless and springs shall be stainless steel. The coil shall be copper continuous duty molded for operating in wet conditions. Control voltage shall be as shown on the plans. The solenoid valve shall be ASCO 8210/8211 Series with a NEMA 3R solenoid enclosure.

2.19 PRESSURE REDUCING VALVES (0.5” THROUGH 2.5”)

A. Pressure reducing valves shall maintain a constant downstream pressure regardless of fluctuations in demand. Valves shall be suitable for 110 psi operating pressure on the inlet side, with outlet pressure set for pressures indicated or required for operational requirements. The valves shall be of a balanced direct acting single seat design with a minimum flow characteristic of "0" gallons per minute. The valve shall close drip tight when the downstream pressures rise above the spring setting. No pressure "creep" or leak can be tolerated. The valve body and cover shall be bronze construction. Trim shall be of 416 stainless steel and shall contain an integral

416 stainless steel strainer. The disc shall be Buna N and diaphragm reinforced neoprene. All necessary maintenance and repairs shall be possible without removing the valve body from the line. The 1-1/4" valve shall have no more than a 15 psi head loss at a flow rate of 50 gpm.

1. The self-contained pressure reducing insert, complete with strainer, is to be replaceable without removing valve from line. The seat/diaphragm assembly shall be fully guided at both the top and bottom.
2. The valve shall be constructed with union tailpieces (NPT) at the inlet and outlet. It shall be possible to check the pressure of the downstream side of the valve from the threaded tappings on either side of the valve body with a pressure gauge. The valve shall be similar and equal to Cla-Val Model 990.

2.20 PILOT CONTROLLED VALVES (2.5” AND LARGER)

A. Basic Valve: The basic pilot controlled valve shall be a hydraulically operated diaphragm actuated globe or angle pattern valve as indicated on the plans.
   1. The main valve shall have a single removable seat and a resilient disc. The stem shall be guided at both ends by a bearing in the valve cover and an integral bearing in the valve seat. No external packing glands are permitted, and there shall be no pistons operating the main valve or any pilot controls. The valve shall be of flanged cast iron construction rated for minimum 200 PSI working pressure. The valve trim shall be bronze. The disc shall be nylon-reinforced BUNA-N Rubber. All necessary repairs including seat replacement shall be possible without removing the valve from the line. All pilot inlets shall be equipped with straight self-cleaning screens. All pilot lines shall have isolating cocks.

B. Solenoid Control Valve: The solenoid pilot valve shall be a three-way valve, energize to open, operating at 110V AC.
   1. The control piping shall be configured to utilize high side inlet water pressure for closing and discharge to low side outlet. The pilot system shall be equipped with a needle valve for closing speed control and a strainer on the water supply side.
   2. The valve shall be similar and equal to a Clayton 136-01 Series.

C. Pressure Sustaining/Pressure Reducing Valve: The valve shall maintain a minimum inlet pressure adjustable by spring setting of the pressure sustaining control to the limits indicated in the plans. The valve shall also act as a pressure reducing valve maintaining a constant downstream pressure regardless of fluctuations in demand between the limits indicated in the plans.
   1. The pressure sustaining pilot control shall be a direct-acting adjustable, spring-loaded, normally closed diaphragm valve which opens when upstream pressure exceeds the spring setting. The control system shall include a strainer-orifice assembly.
   2. The pressure reducing pilot control shall be a direct-acting, adjustable spring-loaded, normally open diaphragm valve which closes when downstream pressure exceeds the spring setting.
   3. The pilot valves shall be equipped with opening and closing speed controls.
   4. The valve shall be a similar and equal to a Clayton Model 92G-01.

D. Surge Relief Valve: The Surge Relief Valve shall maintain constant upstream pressure by bypassing or relieving excess pressure, and shall maintain close pressure limits without causing surges. The pilot control shall be a direct acting adjustable, spring-loaded, diaphragm valve, designed to permit flow when controlling pressure exceeds spring setting. The pilot control

system shall operate such that as excess line pressure is dissipated the main valve shall gradually close to a positive, drip-tight seating.

1. The Surge Relief Valve shall operate at a normal working pressure indicated and shall prevent surge pressures due to pump shut-off based on the pumping conditions described in the plans.
2. The Surge Relief Valve shall be similar and equal to a Clayton Model 50-A-01.

2.21 DIAPHRAGM VALVES

A. Valves shall be straight-thru, positive shut-off design with no obstruction in body. Valves shall be handwheel operated with permanently lubricated lip seal to protect stem. Valve shall have position indicator and limit stops. Diaphragm shall isolate all working parts from fluid line. Materials shall be epoxy coated cast iron body, Viton diaphragm. Valves to be Saunders straight-thru type or equal.

2.22 TELESCOPING SLUDGE VALVES

A. Telescoping sludge valves shall consist of two concentric pipes, one being vertically moveable traveling inside a second fixed pipe. The moveable pipe shall be constructed of brass tubing having a "V" notch weir top configuration and with a bail mounted above the weir. The lifting mechanism shall prevent rotation of the moveable pipe.

B. A lifting stem shall be mounted on the bail and operated by a large diameter handwheel. Support for the lifting stem shall be by Cast or Ductile Iron Floor Stand or a cantilevered stand as indicated. A travel indicator shall be mounted on the assembly. The lower pipe shall be a standard section of flanged pipe. A special flange gasket shall seal the annular opening between the inner tube and outer pipe. Length of the slip pipe shall be sufficient to allow full required travel and allow enough pipe below the companion flange for full support. The unit shall be sized as indicated in the plans and similar and equal to those manufactured by Envirex or Keene.

2.23 MUD VALVES

A. Mud valves shall be flanged end cast iron body bronze mounted units with a rising stem. The valve shall be equipped with a stem extension and handwheel located above the access location of the valves lowest condition. The stem extension shall be supported by a cast iron stem guide. The valve stem, stem nut disc, disc ring and seat shall be bronze. Nuts and bolts shall be rustproofed.

PART 3 - EXECUTION

3.1 INSTALLATION OF VALVES

A. Valves shall be located and oriented as shown on the plans.

B. The Contractor shall perform all work as required by the manufacturer's installation instructions unless otherwise directed by the Engineer.

C. All shafts, columns, and equipment shall be installed in such a manner that will provide a neat and workmanlike job.

D. All valves shall be properly supported.

E. All valves shall be thoroughly cleaned prior to installation.

F. Exposed valves shall be painted in accordance with Section 09 90 00 Painting.

G. Butterfly valves mounted adjacent to check valves, tees or other possible obstructions shall be equipped with spool pieces of at least one pipe diameter unless otherwise shown.

3.2 SETTING VALVES, VALVE BOXES, FITTINGS, AND BLOW OFFS

A. Examination of Material: Prior to installation, valves shall be inspected for direction of opening, freedom of operation, tightness of pressure-containing bolting, cleanliness of valve ports and surfaces, handling damage and cracks.

B. General: Gate valves shall be set and jointed to new pipe in the manner specified for cleaning, laying, and jointing pipe.

C. Valve Boxes: Cast iron valve boxes shall be firmly supported and maintained centered and plumb over the wrench nut of the gate valve, with box cover flush with the surface of the finished pavement or at such other level as may be directed. Unless otherwise directed, valve boxes set in unpaved areas shall be equipped with a 2 foot by 2 foot by 6 inch poured in place concrete slab reinforced with 6 x 6 x w1.4/w1.4 wwm. The top of slab shall be flush with finished grade and base shall be placed on a well compacted subgrade.

D. Back Siphonage to be Prevented: Drainage branches or blow offs shall not be connected to any sewer or submerged in any stream or be installed in any other manner that will permit back siphonage into the distribution system.

END OF SECTION 40 05 51

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