

LIFT STATIONS 2, 6, AND 26 UPGRADES

PREPARED FOR

THE CITY OF
VIDALIA, GEORGIA

**CONSTRUCTION
DOCUMENTS**



CONTRACT DOCUMENTS
AND
TECHNICAL SPECIFICATIONS

Lift Stations 2, 6, and 26 Upgrades

FOR THE

CITY OF VIDALIA

TOOMBS COUNTY

ESG Engineering, Inc.
6400 Peake Road
Macon, Georgia 31210

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CONTRACT DOCUMENTS

SECTION 00100
ADVERTISEMENT FOR BIDS

1. Sealed Bids: Sealed bids for construction of the project entitled **Lift Stations 2, 6, and 26 Upgrades** will be received until 2:00 PM on Thursday, April 18, 2024 at the City Manager's Office, Vidalia City Hall, 302 E First Street Suite C, Vidalia, GA 30474, at which time and place they will be publicly opened and read. No bid may be withdrawn after the closing time for the receipt of bids for a period of sixty (60) days.

2. Work To Be Done: The Work to be completed for the **Lift Stations 2, 6, and 26 Upgrades** is described briefly as follows:

In general, construction shall consist of rehabilitation of two lift stations, construction of a new lift station, and extension of an existing force main. Work will entail removal and replacement of pumps, control panels, fence, gates, floats, etc. The project will also require construction of a new wet well, lift station site, valves, piping, setting doghouse manhole, installing sanitary sewer pipe, and installing force main of various size by means of open cut and jack and bore. Force main installation will require sawcut removal/replace of driveways and asphalt overlay for impacted areas. Bypass pumping will be required as needed to keep wet wells drawn down to maintain compliance during construction.

3. Plans, Specifications and Contract Documents: Complete digital specifications and contract documents are available at www.QuestCDN.com. You may view the digital documents for free by entering the Quest project number **9037559** on the website's project search page. The fee to download the digital documents is \$200 (**non-refundable**) payable through the website. A bidder's proposal will not be considered by the Owner unless the Bidder is on record with Quest/ESG Engineering, Inc. as having purchased and received complete Bidding Documents. Please contact QuestCDN customer support at 952-233-1632 or info@questcdn.com for assistance in membership registration, downloading and working with digital project information. Any other questions can be directed to the issuing office, ESG Engineering, Inc. Margaret Hildebrand officeadmin@esgengineering.com or 478-474-4996

4. Contractor License: Any Contractor submitting a bid must be licensed by the State of Georgia. See Instructions to Bidders for additional bidding requirements.

5. Bonds: Bids shall be accompanied by a bid bond or certified cashier's check in an amount not less than 5% of the base bid. All bonds shall be by a surety company licensed in Georgia with an "A" minimum rating of performance and a financial strength of at least five (5) times the contract price as listed in the most current publication of "Best's Key Rating Guide Property Liability". Performance and Payment Bonds, each in an amount equal to 100% of the contract price shall be required of the successful bidder if contract is awarded. Each Bond shall be accompanied by a "Power of Attorney" authorizing the attorney-in-fact to bind the surety and certified to include the date of the bond.

6. Funding: This project is funded by the GEFA Clean Water SRF Program requiring compliance with applicable state and federal bid laws.

7. Reservation of Rights: Owner reserves the right to reject any or all Bids, including without limitation, the rights to reject any or all nonconforming, nonresponsive, unbalanced or conditional

Bids and to reject the Bid of any Bidder if Owner believes that it would not be in the best interest of the Project to make an award to that Bidder, whether because the Bid is not responsive or the Bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by the Owner.

City of Vidalia
Represented By: Bill Bedingfield
City Manager

SECTION 00200
INSTRUCTIONS TO BIDDERS

INTENTION: It is intended that the Instructions to Bidders, General Conditions, Supplementary Conditions, Technical Specifications and Construction Drawings shall cover the complete work to which they relate.

ARTICLE 1 DEFINED TERMS: In addition to the terms defined in the General Conditions, (EJCDC 1910-8) (1996), additional terms used in these Instructions to Bidders have the meanings indicated below which are applicable to both the singular and plural thereof.

- 1.1 **Bidder** – One who submits a Bid directly to Owner as distinct from a sub-bidder, who submits a bid to a Bidder.
- 1.2 **Successful Bidder** – The lowest, responsible and responsive Bidder to whom Owner (on the basis of Owner’s evaluation as hereinafter provided) makes an award.
- 1.3 **Bid** – A complete and properly signed offer to execute work for the prices stipulated in Bid Form and submitted in accordance with the Bidding Documents.
- 1.4 **Addenda** – Graphic or written documents issued by Engineer prior to the opening of Bids issued to clarify, revise, add to, or delete information in the original bidding documents or in previous addenda.

ARTICLE 2 BID FORM: All bids must be made upon the Bid Forms hereto annexed, and shall state the amount bid for each item shown, and all bids must be for materials and work called for in the specifications. **Deposits for plans and specifications are not refundable.**

- 2.1 The Bid Form is included with the Bidding Documents; additional copies may be obtained from Engineer.
- 2.2 All blanks on the Bid Form must be completed by printing in black ink or by typewriter.
- 2.3 Bids by corporations must be executed in the corporate name by the president or a vice-president (or other corporate officer accompanied by evidence of authority to sign) and the corporate seal must be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation must be shown below the signature.
- 2.4 All names must be typed or printed in black ink below the signature.
- 2.5 The Bid shall contain an acknowledgement of receipt of all Addenda (the

numbers of which must be filled in on the Bid Form).

- 2.6 The address and telephone number for communications regarding the Bid must be shown.

ARTICLE 3 QUALIFICATIONS OF BIDDERS:

- 3.1 To demonstrate qualifications to perform the Work, each Bidder must submit within five (5) days after Bid opening upon Owner's request detailed written evidence such as financial data, previous experience, present commitments, and other such data as may be necessary to assist Owner in determining Contractor's qualifications.
- 3.2 Each Bid must contain evidence of Contractor's authority to conduct business in the state where the Work is to be performed. State Contractor license number, if applicable, must also be shown on the Bid Form.

ARTICLE 4 COPIES OF BIDDING DOCUMENTS:

- 4.1 Complete sets of Bidding Documents must be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
- 4.2 Owner and Engineer in making copies of Bidding Documents available for a non-refundable deposit do so only for the purpose of obtaining Bids for the Work and do not confer a license or grant for any other use.

ARTICLE 5 EXAMINATION OF BIDDING DOCUMENTS, OTHER DATA, AND SITE:

- 5.1 It is the responsibility of each Bidder before submitting a bid:
 - 5.1.1 To examine and study thoroughly the Bidding Documents and other related data identified in the Bidding Documents;
 - 5.1.2 To visit the work site to ascertain by inspection pertinent location conditions such as location, character and accessibility of the site including existing surface and subsurface conditions in the work area; availability of facilities, location and character of existing work within or adjacent thereto, labor conditions, etc.
 - 5.1.3 To become familiar with and satisfy Bidder as to all federal, state, and local Laws and Regulations that may affect cost, progress, or performance of the Work;

- 5.1.4 To obtain and carefully study (or assume responsibility for doing so) all addition or supplementary examination investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and underground facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work or which relate any aspect of the means, methods, techniques, sequences, and procedures of construction expressly required of the bidding documents, and safety precautions and programs incident thereto;
 - 5.1.5 To study and carefully correlate Bidder's knowledge and observations with the Bidding Documents and such other related data; and
 - 5.1.6 To promptly notify Engineer of all conflicts, errors, ambiguities or discrepancies which Bidder has discovered in or between the Biding Documents and such other related documents;
 - 5.1.7 To agree at the time of submitting its Bid that no further examinations, investigations, explorations, tests, studies or data are necessary for the determination of its Bid for performance of the work at the price bid and within the times and in accordance with the other terms and conditions of the Bidding Documents;
 - 5.1.8 To become aware of the general nature of the work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents;
 - 5.1.9 To determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work.
- 5.2 The Owner shall make available to all prospective bidders, previous to receipt of bids, information that it may have as to sub-soil conditions and surface topography at the work site. Such information shall be given as the best factual information available without being considered as a representation of the Owner.
- 5.3 The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 5, that without exception, the Bid is premised upon performing and furnishing the Work required by the Bidding Documents and applying any specific means, methods, techniques, sequences, and procedures of construction

that may be shown or indicated or expressly required by the Bidding Documents, that Bidder has given Engineer written notice of all conflicts, errors, ambiguities, and discrepancies that Bidder has discovered in the Bidding Documents and the written resolutions thereof by Engineer are acceptable to Bidder, and that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work.

ARTICLE 6 PRE-BID CONFERENCE:

- 6.1 If owner elects to conduct a pre-bid conference, all plan holders will be notified via addendum.

ARTICLE 7 INTERPRETATIONS AND ADDENDA:

- 7.1 All questions about the meaning or intent of the Bidding Documents are to be directed to Engineer. The person submitting the request shall do so in writing and be responsible for its prompt delivery. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda mailed or delivered to all parties recorded by Engineer as having received the bidding Documents. Questions received less than ten days prior to the date for opening of Bids may not be answered. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.
- 7.2 Addenda may also be issued to modify the Bidding Documents as deemed advisable by Owner or Engineer.

ARTICLE 8 BID SECURITY:

- 8.1 All bid forms must be accompanied by a Bid Bond in an amount not less than five percent (5%) of the amount bid. The successful bidder, if awarded the Contract, will be required to furnish a Performance Bond and Payment Bond, each in the amount of one hundred percent (100%) of the Contract amount. All bonds must appear on the Treasury Department's most current Circular 570 Listing.
- 8.2 The Bid security of Successful Bidder will be retained until such Bidder has executed the Agreement, furnished the required contract security and met the other conditions of the Notice of Award, whereupon the Bid security will be returned. If the Successful Bidder fails to execute and deliver the Agreement and furnish the required contract security within fifteen days after the Notice of Award, Owner may annul the Notice of Award and the Bid security of that Bidder will be forfeited. The Bid security of other Bidders whom Owner believes to have a reasonable chance of receiving the

award may be retained by Owner until the earlier of the seventh day after the Effective Date of the Agreement or the sixty-first day after the Bid opening, whereupon Bid security furnished by such bidders will be returned. Bid security with Bids, which are not competitive, will be returned within seven days after the Bid opening.

ARTICLE 9 CONTRACT COMPLETION TIME: The number of days within which, or by which the Work is to be (a) Substantially Completed and (b) also completed and ready for final payment are set forth in the Agreement. Provisions for liquidated damages, if any, are set forth in the Agreement.

ARTICLE 10 SUBSTITUTES AND "OR EQUAL" TERMS:

10.1 The Contract, if awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents, or those Substitute or "Equal" materials and equipment approved by Engineer. Materials and equipment described in the Bidding Documents establish a standard of required type, function and quality to be met by any proposed Substitute or "Equal" item.

10.2 No item of material or equipment will be considered by Engineer as a Substitute/ "or-equal" unless written request for approval has been submitted by Bidder and has been received by Engineer at least 15 days prior to the date for receipt of Bids. Each such request shall conform to the requirements of Paragraph 6.7.1 of the General Conditions. The burden of proof of the merit of the proposed item is upon Bidder. Engineer's decision of approval or disapproval to allow inclusion of a proposed item in the Bid will be final. Contractor shall refer to General Conditions (Paragraph 6.7.1), Supplementary Conditions (Section 5.0), and the Technical Specifications or further guidance on submittal procedure and approval requirements on substitutes or "or-equal" items.

ARTICLE 11 SUBCONTRACTORS, SUPPLIERS, AND OTHERS:

11.1 If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, individuals, or entities to be submitted to Owner in advance of a specified date prior to the Effective Date of the Agreement, the apparent Successful Bidder, and any other Bidder so requested, shall within five days after Bid opening, submit to owner a list of all such Subcontractors, Suppliers, individuals, or entities proposed for those portions of the Work for which such identification is required. Such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, individual, or entity if requested by Owner. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, individual, or entity, Owner may, before

the Notice of Award is given, request apparent Successful Bidder to submit a substitute/ "or-equal",

- 11.2 If apparent Successful Bidder declines to make any such substitution/ "or-equal", Owner may award the Contract to the next lowest Bidder that proposes to use acceptable subcontractors, Suppliers, individuals, or entities. Declining to make requested substitutions would not constitute grounds for forfeiture of the bid security of any Bidder. Any Subcontractor, Supplier, individual, or entity 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 revocation of such acceptance after the Effective Date of the Agreement as provided in paragraph 6.06 of the General Conditions.
- 11.3 Contractor shall not be required to employ any Subcontractor, Supplier, individual, or entity against whom Contractor has reasonable objection.

ARTICLE 12 SUBMITTAL OF BIDS: Bids shall be submitted at the time and place indicated in the Advertisement for Bids and shall be enclosed in a sealed opaque envelope, marked with the project title, and name and address of Bidder, and accompanied by the Bid security and other required documents. If the Bid is sent through the mail or other delivery system, the sealed envelope shall be enclosed in a separate envelope with the notation "BID ENCLOSED" on the face of it.

Each Bidder is responsible for seeing that his Bid is received by the Owner not later than the advertised time set for the opening of Bids.

- A. Additional documents required to be completed and included with the submission of each Bid include the following:
1. Section 00210 – Immigration and Security Form
 2. Section 00470 – Qualifications of Bidder
 3. Section 00480 – Certification of Non-Segregated Facilities
 4. Section 00481 – Noncollusion Affidavit of Prime Bidder

ARTICLE 13 MODIFICATION AND WITHDRAWAL OF BIDS

- 13.1 Bids may be modified or withdrawn by an appropriate document duly executed (in the manner that a Bid must be executed) and delivered to the place where Bids are to be submitted at any time prior to the opening of bids.

- 13.2 If, within twenty-four 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, that Bidder may withdraw its Bid and the Bid security will be returned. Thereafter, that Bidder will be disqualified from further bidding on the Work to be provided.

ARTICLE 14 OPENING OF BIDS: Bids will be opened and (unless obviously non-responsive) read aloud publicly at the place where Bids are to be submitted. An abstract of the amount of the base Bids and major alternates (if any) will be made available to Bidders after the opening of Bids.

ARTICLE 15 ACCEPTANCE OF BIDS: Bids may not be withdrawn (except as noted in Paragraph 13) after the time set for the opening of Bids. Bids will remain subject to acceptance for sixty (60) days after the day of the Bid opening, but the Owner may, in its sole discretion, release any Bid and return the Bid security prior to expiration of the acceptance period.

ARTICLE 16 AWARD OF CONTRACT:

- 16.1 Owner reserves the right to reject any or all Bids, including without limitation, the rights to reject any or all nonconforming, nonresponsive, unbalanced or conditional Bids and to reject the Bid of any Bidder if Owner believes that it would not be in the best interest of the Project to make an award to that Bidder, whether because the Bid is not responsive, or the Bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by the Owner.
- 16.2 Owner also reserves the right to waive all informalities not involving price, time or changes in the Work and to negotiate contract terms with the Successful Bidder. 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. Discrepancies between words and figures will be resolved in favor of the words.
- 16.3 In evaluating Bids, Owner will consider the qualification of Bidders, whether or not 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.

The Owner will also consider whether the Bidder involved:

- (a) Maintains a permanent place of business;

- (b) Has adequate plant and equipment to do the work properly and expeditiously;
- (c) Has suitable financial status to meet obligations incidental to the work;
- (d) Has appropriate technical experience.

16.4 Owner may consider the qualifications and experience of Subcontractors, Suppliers, and other persons and organizations proposed for those portions of the Work as to which the identity of Subcontractors, Suppliers, and other persons and organizations must be submitted as provided in the Supplementary Conditions. Owner also may consider the operating costs, maintenance requirements, performance data and guarantees of major items of materials and equipment proposed for incorporation in the Work when such data is required to be submitted prior to the Notice of Award.

16.5 Owner may conduct such investigations as Owner deems necessary to assist in the evaluation of any bid and to establish the responsibility, qualifications and financial ability of Bidders, proposed Subcontractors, Suppliers and other persons and organizations to perform and furnish the Work in accordance with the Contract Documents to Owner's satisfaction within the prescribed time.

16.6 If the contract is to be awarded, it will be awarded to the Bidder whose evaluation by Owner indicates to Owner that the award will be in the best interests of the Project.

16.7 If the contract is to be awarded, Owner will give Successful Bidder a Notice of Award within sixty (60) days after the day of the Bid opening.

ARTICLE 17 MODIFICATIONS OF QUANTITIES: If the lowest bona fide Bid exceeds the money available for the Work, the Owner reserves the right to delete enough of the Work to bring the cost within the available funds. The Owner also reserves the right to delete whichever items or portions of items he considers to be in the best interest of the Owner.

ARTICLE 18 CONTRACT SECURITY: The General Conditions and Supplementary Conditions set forth Owner's requirements as to performance and payment bonds. When the Successful Bidder delivers the executed Agreement to the Owner, it must be accompanied by the required performance and payment bonds.

ARTICLE 19 SIGNING THE AGREEMENT: When the Owner gives a Notice of Award to the Successful Bidder, it will be accompanied by the required number of unsigned counterparts of the Agreement with all other written Contract Documents attached. Within fifteen (15) days thereafter, Contractor shall sign and deliver the

required counterparts of the Agreement and attached documents to Owner with the required Bonds. Within ten (10) days thereafter, Owner shall deliver one fully signed counterpart to the Contractor.

ARTICLE 20 LAWS AND REGULATIONS: The Contractor shall comply with local, District, County, State and Federal laws applicable to the work.

The Contractor shall comply with the Department of Labor Safety and Health Regulations for Construction promulgated under the Occupational Safety and Health Act of 1970 (PL 91-596) and under Section 107 of the Contract Work and Safety Standards Act (PL 91-54). The regulations are administered by the Department of Labor and the Contractor shall allow access to the project to personnel from that Department.

ARTICLE 21 CONTRACTOR'S AND SUBCONTRACTOR'S INSURANCE: Contractor shall not commence work under this contract until he has obtained all the insurance required by the Supplementary Conditions.

ARTICLE 22 TERMINATION OF CONTRACT: If the Owner is made to stop construction of the work because of an order from a Court or State Department, the contract shall be terminated. Payment will be made for work completed and a proration of the work underway, materials stored, and for the overhead and profit of the completed work and work underway. Payment will not be made for anticipated profit and overhead on work not completed or underway.

END OF SECTION

**SECTION 00210
Immigration and Security Form**

IMMIGRATION AND SECURITY FORM

**THE SUCCESSFUL BIDDER MUST PROVIDE THE OWNER WITH THE
PROPERLY COMPLETED AND PROPERLY SIGNED IMMIGRATION AND SECURITY FORMS AS
REQUIRED BY
GEORGIA SENATE BILL 529
"GEORGIA SECURITY AND IMMIGRATION COMPLIANCE ACT OF 2006" O.C.G.A. § 13-10-90 AND § 13-10-
91**

THIS FORM MUST BE COMPLETED BY ALL CONTRACTORS AND SUBCONTRACTORS

THE FORM ATTACHED HERETO.

IMMIGRATION AND SECURITY FORM

A. In order to insure compliance with the Immigration Reform and Control Act of 1986 (IRCA), Pub.L. 99-603 and the Georgia Security and Immigration Compliance Act O.C.G.A. § 13-10-90 et. seq., Contractor must initial one of the sections below:

_____ Contractor has 500 or more employees and Contractor warrants that Contractor has complied with the Immigration Reform and Control Act of 1986 (IRCA) Pub.L. 99-603 and the Georgia Security and Immigration Compliance Act by registering at <https://www.vis-dhs.com/EmployerRegistration> and verifying information of all new employees; and by executing any affidavits required by the rules and regulation issued by the Georgia Department of Labor set forth at Rule 300-10-1-.01 et. seq.

_____ Contractor has 100-499 employees and Contractor warrants that no later than July 1, 2008, Contractor will register at <https://www.vis-dhs.com/EmployerRegistration> to verify information of all new employees in order to comply with the Immigration Reform and Control Act of 1986 (IRCA) Pub.L. 99-603 and the Georgia Security and Immigration Compliance Act; and by executing any affidavits required by the rules and regulation issued by the Georgia Department of Labor set forth at Rule 300-10-1-.01 et. seq.

_____ Contractor has 99 or fewer employees and Contractor warrants that no later than July 1, 2009, Contractor will register at <https://www.vis-dhs.com/EmployerRegistration> to verify information of all new employees in order to comply with the Immigration Reform and Control Act of 1986 (IRCA) Pub.L. 99-603 and the Georgia Security and Immigration Compliance Act; and by executing any affidavits required by the rules and regulation issued by the Georgia Department of Labor set forth at Rule 300-10-1-.01 et. seq.

B. Contractor warrants that Contractor has included a similar provision in all written agreements with any subcontractors engaged to perform services under its Contract(s) with the City of Vidalia.

Signature Title

Firm Name:

Street/Mailing Address:

City, State, Zip Code:

Telephone Number:

Email Address:

CONTRACTOR AFFIDAVIT AND AGREEMENT

By executing this affidavit, the undersigned contractor verifies its compliance with O.C.G.A. 13-10-91, stating affirmatively that the individual, firm, or corporation which is contracting with City of Vidalia has registered with and is participating in a federal work authorization program* [any of the electronic verification of work authorization programs operated by the United States Department of Homeland Security or any equivalent federal work authorization program operated by the United States Department of Homeland Security to verify information of newly hired employees, pursuant to the Immigration Reform Act of 1986 (IRCA), P.L. 99-603], in accordance with the applicability provisions and deadlines established in O.C.G.A. 13-10-91.

The undersigned further agrees that, should it employ or contract with any subcontractor(s) in connection with the physical performance of services pursuant to this contract with City of Vidalia, contractor will secure from such subcontractor(s) similar verification of compliance with O.C.G.A. 13-10-91 on the Subcontractor Affidavit provided in Rule 300-10-01-.08 or a substantially similar form. Contractor further agrees to maintain records of such compliance and provide a copy of each such verification to the City of Vidalia at the time the subcontractor(s) is retained to perform such service.

EEV / Basic Pilot Program* User Identification Number

BY: Authorized Officer or Agent
(Contractor Name)

Title of Authorized Officer or Agent of Contractor

Printed Name of Authorized Officer or Agent of Contractor

SUBSCRIBED AND SWORN
BEFORE ME ON THIS THE
_____ DAY OF _____, 20__

Notary Public
My Commission Expires:

* As of the effective date of O.C.G.A. 13-10-91, the applicable federal work authorization program is the "EEV / Basic Pilot Program" operated by the U.S. Citizenship and Immigration Services Bureau of the U.S. Department of Homeland Security, in conjunction with the Social Security Administration (SSA)

(End of Form)

SUBCONTRACTOR AFFIDAVIT

By executing this affidavit, the undersigned contractor verifies its compliance with O.C.G.A. 13-10-91, stating affirmatively that the individual, firm, or corporation which is engaged in the physical performance of services under a contract with City of Vidalia has registered with and is participating in a federal work authorization program* [any of the electronic verification of work authorization programs operated by the United States Department of Homeland Security or any equivalent federal work authorization program operated by the United States Department of Homeland Security to verify information of newly hired employees, pursuant to the Immigration Reform Act of 1986 (IRCA), P.L. 99-603], in accordance with the applicability provisions and deadlines established in O.C.G.A. 13-10-91.

EEV / Basic Pilot Program* User Identification Number

BY: Authorized Officer or Agent
(Contractor Name)

Title of Authorized Officer or Agent of Contractor

Printed Name of Authorized Officer or Agent of Contractor

SUBSCRIBED AND SWORN
BEFORE ME ON THIS THE
_____ DAY OF _____, 200__

Notary Public
My Commission Expires:

* As of the effective date of O.C.G.A. 13-10-91, the applicable federal work authorization program is the "EEV / Basic Pilot Program" operated by the U.S. Citizenship and Immigration Services Bureau of the U.S. Department of Homeland Security, in conjunction with the Social Security Administration (SSA)

(End of Form)

END OF SECTION

**SECTION 00410
BID FORM**

PROJECT IDENTIFICATION:

Lift Stations 2, 6, and 26 Upgrades

CONTRACT IDENTIFICATION AND NUMBER:

V2000.003

THIS BID IS SUBMITTED TO:

City of Vidalia
302 E First Street
Suite C
Vidalia, GA 30474.

THIS BID IS SUBMITTED FROM:

Bidder: _____

Address: _____

Phone: _____

State of Georgia Utility Contractor's License No.: _____

1. The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an agreement with Owner in the form included in the Contract Documents to perform and furnish all Work as specified or indicated in the Contract Documents for the Contract Price and within the Contract Time indicated in this Bid and in accordance with the other terms and conditions of the Contract Documents.

2. Bidder accepts all of the terms and conditions of the Advertisement or Invitation to Bid and Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 60 days after the day of Bid opening. Bidder will sign and submit the Agreement with the Bonds and other documents required by the Bidding Requirements within fifteen days after the date of Owner's Notice

of Award.

3. In submitting this Bid, Bidder represents, as more fully set forth in the Agreement, that:

(a) Bidder has examined copies of all the Bidding Documents and of the following Addenda (receipt of all which is hereby acknowledged):

Date	Addendum Number

(b) Bidder has familiarized itself with the nature and extent of the Contract Documents, Work, site, locality, and all local conditions and Laws and Regulations that in any manner may affect cost, progress, performance or furnishing of the Work.

(c) Bidder has studied carefully all reports and drawings of subsurface conditions and drawings of physical conditions which are identified in the Supplementary Conditions as provided in paragraph 4.2 of the General Conditions, and accepts the determination set forth in paragraph 4.2.1 of the Supplementary Conditions of the extent of the technical data contained in such reports and drawings upon which Bidder is entitled to rely.

(d) Bidder has obtained and carefully studied (or assumes responsibility for obtaining and carefully studying) all such examinations, investigations, explorations, tests and studies (in addition to or to supplement those referred to in (c) above) which pertain to the subsurface or physical conditions at the site or otherwise may affect the cost, progress, performance or furnishing of the Work as Bidder considers necessary for the performance or furnishing of the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of paragraph 4.2 of the General Conditions; and no additional examinations, investigations, explorations, tests, reports or similar information or data are or will be required by Bidder for such purposes.

(e) Bidder has reviewed and checked all information and data shown or indicated on the Contract Documents with respect to existing Underground Facilities at or contiguous to the site and assumes responsibility for the accurate location of said Underground Facilities. No additional examinations, investigations, explorations, tests, reports or similar information or data in respect of said Underground Facilities are or will be required by Bidder in order to perform and furnish the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of paragraph 4.3 of the General Conditions.

(f) Bidder has correlated the results of all such observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the Contract Documents.

Bidder has given Engineer written notice of all conflicts, errors or discrepancies that it has discovered in the Contract Documents and the written resolution thereof by Engineer is acceptable to Bidder.

(g) This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with an agreement or rules of any group, association, organization or corporation; Bidder has not directly or indirectly induced or solicited any other corporation to refrain from bidding; and Bidder has not sought by collusion to obtain for itself any advantage over any other Bidder or over Owner.

(h) Bidder agrees to commence work under this Agreement on or before a date to be specified in a written "Notice to Proceed" of the Owner.

(i) Bidder accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the Work on time.

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

BID FORM BEGINS ON PAGE 4

(a) BASE BID: Lift Stations 2, 6, and 26 Upgrades

The Contractor is directed to Section 01025 "Measurement and Payment" for the methods and limits for payments to the Contractor for the pay items listed below:

LIFT STATION #2 UPGRADES					
ITEM NO.	QTY.	UNIT	DESCRIPTION	UNIT PRICE	TOTAL PRICE
1	1	LS	Materials, equipment, and labor required for installation of two new submersible pumps in existing triplex lift station, new level control system, new triplex lift station control panel, and electrical components per the plans and specifications, complete.	\$	\$
2	2	EA	Demolition and replacement of existing hatch with larger hatch unit in wetwell top	\$	\$
3	1	LS	By-pass Pumping	\$	\$
LIFT STATION #2 UPGRADES SUBTOTAL					\$
LIFT STATION #6 UPGRADES					
ITEM NO.	QTY.	UNIT	DESCRIPTION	UNIT PRICE	TOTAL PRICE
4	1	LS	Materials, equipment, and labor required for installation of two new submersible pumps in existing duplex lift station, new level control system, new duplex lift station control panel, and electrical components per the plans and specifications, complete.	\$	\$
5	1	LS	Site work including fencing/gate	\$	\$
6	1	LS	By-pass Pumping	\$	\$
7	1	LS	Tie-in to existing 4" forcemain and abandon/plug existing manhole termination point	\$	\$
8	1563	LF	Sanitary Sewer Force Main, 6" HDPE - Open Cut	\$	\$
9	80	LF	Sanitary Sewer Force Main - Directional Drill w/ 10" HDPE casing for 6" HDPE carrier pipe	\$	\$
10	10	LF	Sanitary Sewer Force Main, 6" HDPE - Free Bore	\$	\$
11	2	EA	Air Release Valve and assembly with MH, complete	\$	\$
12	22	SY	"Class A" Roadway Removal and Replacement	\$	\$
13	60	SY	Concrete Driveway removal and replacement	\$	\$
14	10	SY	Gravel Driveway removal and replacement	\$	\$
LIFT STATION #6 UPGRADES SUBTOTAL					\$

LIFT STATION #26 UPGRADES					
ITEM NO.	QTY.	UNIT	DESCRIPTION	UNIT PRICE	TOTAL PRICE
15	1	LS	Preliminary Exploration work to locate existing gravity mains and forcemain. Contractor shall confirm sizes and depths for tie-in to new lift station gravity feed and FM piping. Work will be required in conjunction with submittals for the connection materials.	\$	\$
16	1	LS	Site work including clearing, fencing/gate, gravel pad, and final clean-up.	\$	\$
17	1	LS	Materials, equipment, and labor required for installation of new wetwell, two new submersible pumps, new level control system, new duplex lift station control panel, and electrical components per the plans and specifications, complete.	\$	\$
18	1	LS	Precast valve vault including piping, check valves, isolation valves, pressure gauge, and air release valve.	\$	\$
19	1	LS	Doghouse Manhole Installation		
20	40	LF	8" Gravity Main - Open Cut	\$	\$
21	30	LF	Sanitary Sewer Force Main, 4" HDPE - Open Cut	\$	\$
22	1	LS	Forcemain Tie-in		
23	1	LS	By-pass Pumping	\$	\$
LIFT STATION #26 UPGRADES SUBTOTAL					\$
EROSION CONTROL					
24	5	EA	Construction Exit	\$	\$
25	40	LF	Silt Fence	\$	\$
26	2	EA	Hay Bale Check Dam	\$	\$
27	0.3	AC	Grassing	\$	\$
EROSION CONTROL SUBTOTAL					\$
ALLOWANCES					
28	1	LS	GA Power to provide upgrades at LS #2 and 3-phase power to LS #6	\$ 60,000.00	\$ 60,000.00
29	1	LS	Supplementary Work Agreement (SWA)	\$ 100,000.00	\$ 100,000.00
ALLOWANCES SUBTOTAL					\$ 160,000.00
TOTAL BASE BID (LIFT STATION #2, #6, AND #26 + EROSION CONTROL + ALLOWANCES)					\$

ALTERNATE BID					
30-A	1	LS	Demolition of existing storage building and installation of new deisel By-Pass Pump Complete with Suction and Discharge Piping at LS #2 per the plans and specifications	\$	\$

Bidder agrees to furnish all labor, materials, and equipment necessary to construct the Lift Stations 2, 6, and 26 Upgrades for the City of Vidalia for the Base Bid sum of

_____ Dollars
 (\$_____).

6. Bidder agrees that the Work will be substantially complete and ready for final payment in accordance with paragraph 14.07.B of the General Conditions within 300 calendar days after the date when the Contract Times commence to run.
7. Bidder accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the Work within the times specified in the Agreement.
8. The following documents are attached to and made a condition of this Bid:
 - a. Required Bid Security in the form of 5% of the Bid Total Price.
9. The undersigned further agrees that in case of failure on his part to execute the said contract and the Bond within fifteen (15) consecutive calendar days after written notice being given of the award of the contract, the check or bid bond accompanying this bid, and the monies payable thereon shall be paid into the funds of the Owner as liquidated damages for such failure, otherwise, the check or bid bond accompanying this proposal shall be returned to the undersigned.
10. Communications concerning this Bid shall be addressed to:

ESG Engineering, Inc
 6400 Peake Rd
 Macon, GA 31210
 Attn: Catherine Mays
 officeadmin@esgengineering.com
11. Terms used in this Bid which are defined in the General Conditions or Instructions to Bidders will have the meanings indicated in the General Conditions of Instructions.

SUBMITTED on _____, 20__.

BIDDER: _____

BY: _____

TITLE: _____

STATE CONTRACTOR
LICENSE NO. _____

ADDRESS: _____

PHONE: _____

Seal: (if bid by a Corporation)

END OF SECTION

**SECTION 00460
BID BOND**

STATE OF GEORGIA

COUNTY OF TOOMBS

KNOW ALL MEN BY THESE PRESENTS, that we, _____, as Principal, and _____, as Surety, are held and firmly bound unto the City of Vidalia for the sum of _____ Dollars (\$_____) lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, personal representatives, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted to the Owner a Proposal for construction of:

Lift Stations 2, 6, and 26 Upgrades

NOW THEREFORE, the conditions of this obligation are such that if the Bid be accepted, the Principal shall within ten days after receipt of conformed contract documents execute a contract in accordance with the Bid upon the terms, conditions and prices set forth therein, and in the form and manner required by the Owner and execute a sufficient and satisfactory Performance Bond and Payment Bond payable to the Owner, each in an amount of one hundred percent (100%) of the total contract price, in form and with security satisfactory to the Owner, or in the event of the failure of the Contractor to execute and deliver the Contract Agreement and give said Performance and Payment Bonds, the Contractor shall pay the Owner the difference not to exceed the penalty hereof between the amount specified in said Proposal and such larger amount for which the Owner may in good faith contract with another party to perform the work covered by said Proposal, and execute the Special Assurances form, then this obligation shall be void; otherwise, it shall be and remain in full force and virtue in law; and the Surety shall, upon failure of the Principal to comply with any or all of the foregoing requirements within the time specified above, immediately pay to the aforesaid Owner, upon demand, the amount hereof in good and lawful money of the United States of America, not as a penalty, but as liquidated damages.

This bond is given pursuant to and in accordance with the provisions of O.C.G.A. Section 36-91-40 et seq. and Section 30-91-50 et seq. an all the provisions of the law referring to this character of

bond as set forth in said sections or as may be hereinafter enacted and these are hereby made a part hereof to the same extent as if set out herein in full.

IN WITNESS WHEREOF, the said Principal has hereunder affixed its signature and said Surety has hereunto caused to be affixed its corporate signature and seal, by its duly authorized officers, on this ____ day of _____, 20 ____.

PRINCIPAL: _____

Signed and sealed in the presence of _____ By: _____

1. _____ Title: _____

2. _____

SURETY: _____

Signed and sealed in the presence of: _____ By: _____

1. _____ Title: _____

2. _____

END OF SECTION

**SECTION 00470
QUALIFICATIONS OF BIDDER**

All questions must be answered and the data given must be clear and comprehensive. This statement must be notarized. If necessary, questions may be answered on separate attached sheets. The Bidder may submit any additional information he desires.

1. Legal Name of Bidder.
2. Permanent main office address.
3. When organized.
4. If a corporation, where incorporated.
5. How many years have you been engaged in the contracting business under your present firm or trade name?
6. Contract on hand: (Schedule these, showing amount of each contract and the appropriate anticipated dates of completion.)
7. General character of work performed by your company.
8. Have you ever failed to complete any work awarded to you? If so, where and why?
9. Have you ever defaulted on a contract? If so, where and why?
10. List the more important projects recently completed by your company, stating the approximate cost for each, and the month and year completed.
11. List your major equipment available for this contract.
12. Experience in construction work similar in importance to this project.
13. Background and experience of the principal members of your organization, including the officers.
14. Credit available: \$_____.
15. Give Bank Reference _____.
16. Will you, upon request, fill out a detailed financial statement and furnish any other information that may be required by the _____.
17. The undersigned authorizes and requests any person, firm, or corporation to furnish any information requested by the _____, Georgia in

verification of the recitals comprising the Statement of Bidder's Qualifications. Dated at _____ this ____ day of _____, 20____.

(Name of Bidder)

By _____

Title _____

State of _____

County of _____

_____, being duly sworn deposes and
says that he is _____ of _____
(name of organization)

and that the answers to the foregoing questions and all statements therein contained are true and correct.

Subscribed and sworn to before me this ____ day of _____, 20____.

(Notary Public)

My Commission expires:

_____, 20____

**SECTION 00480
CERTIFICATION OF NONSEGREGATED FACILITIES**

(To be completed and submitted with Bid)

Bidder certifies that he does not maintain or provide for his employees any segregated facilities at any of his establishments, and that he does not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. The Bidder agrees that a breach of this certification will be a violation of the Equal Opportunity clause in any contract resulting from acceptance of this bid. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, timeclocks, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, or national origin, because of habit, local custom, or otherwise. The Bidder agrees that (except where he has obtained identical certification from proposed subcontractors for specific time periods) he will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity clause, and that he will retain such certification in his files.

Note: The penalty for making false statements in offers is prescribed in 18 U.S.C. & 1001.

Date _____, 20____ _____
(Name of Bidder)

Official Address

BY: _____

TITLE: _____

**SECTION 00481
NONCOLLUSION AFFIDAVIT OF PRIME BIDDER**

State of Georgia

County of Toombs

_____, being first duly sworn, deposed
and says that:

(1) He is

_____ of
(owner, partner, officer, representative, or agent)

_____, the Bidder that has
submitted the attached Bid;

(2) He is fully informed respecting the preparation and contents of the attached Bid
and of all pertinent circumstances respecting such Bid;

(3) Such Bid is genuine and is not a collusive or sham Bid;

(4) Neither the said Bidder nor any of its officers, partners, owners, agents,
representatives, employees or parties in interest, including this affidavit, has in any
way colluded, conspired, connived or agreed, directly or indirectly with any other
Bidder, firm or person to submit a collusive or sham Bid in connection with the
Contract for which the attached Bid has been submitted or to refrain from bidding
in connection with such contract, or has in any manner directly or indirectly sought
by agreement or collusion or communication or conference with any other Bidder,
firm or person to fix the price or prices in the attached Bid or of any other Bidder,
or to fix any overhead, profit or cost element of the Bid price or the Bid price of any
other Bidder, or to secure through any collusion, conspiracy, connivance or
unlawful agreement any advantage against the **City of Vidalia** or any person
interested in the proposed Contract and;

(5) The price or prices quoted in the attached Bid are fair and proper and are not
tainted by any collusion, conspiracy, connivance or unlawful agreement on the part
of the Bidder or any of its agents, representatives, owners, employees, or parties in
interest, including this affidavit.

By: _____

Title: _____

Subscribed and sworn to before me this ____ day of _____, 20__.

(Notary Public)

My commission expires _____, 20__.

**SECTION 00500
AGREEMENT**

THIS AGREEMENT is dated as of the ____ day of _____ in the year 20____, by and between the City of Vidalia (hereinafter called OWNER) and _____ (hereinafter called CONTRACTOR).

OWNER and CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows:

Article 1. WORK.

CONTRACTOR shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

In general, construction shall consist of rehabilitation of two lift stations, construction of a new lift station, and extension of an existing force main. Work will entail removal and replacement of pumps, control panels, fences, gates, floats, etc. The project will also require construction of a new wet well, lift station site, valves, piping, setting doghouse manhole, installing sanitary sewer pipe, and installing force main of various size by means of open cut and jack and bore. Force main installation will require sawcut removal/replace of driveways and asphalt overlay for impacted areas. Bypass pumping will be required as needed to keep wet wells drawn down to maintain compliance during construction.

Article 2. ENGINEER.

The Project has been designed by **ESG Engineering** who is hereinafter called ENGINEER and who is to act as OWNER's representative, assume all duties and responsibilities and have the rights and authority assigned to ENGINEER in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents.

Article 3. CONTRACT TIME.

3.1. CONTRACTOR agrees to commence Work under this Agreement on or before a date to be specified on a written "Notice to Proceed" of the OWNER and to fully complete the Work within 300 consecutive calendar days from the "Notice to Proceed" date.

3.2. Liquidated Damages. OWNER and CONTRACTOR recognize that time is of the essence of this Agreement and that OWNER will suffer financial loss if the Work is not completed within the times specified in paragraph 3.1 above, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. They 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) CONTRACTOR shall pay OWNER Five Hundred Dollars (\$500.00) for each day that expires after the time specified in paragraph 3.1.

Article 4. CONTRACT PRICE.

OWNER shall pay CONTRACTOR for completion of the Work in accordance with the Contract Documents in current as follows:

Article 5. PAYMENT PROCEDURES.

CONTRACTOR shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed by ENGINEER as provided in the General Conditions.

5.1 Progress Payments; Retainage. OWNER shall make progress payments on account of the Contract Price on the basis of CONTRACTOR'S Applications for Payment as recommended by ENGINEER, on or about the 25th day of each month during performance of the Work as provided in paragraphs 5.1.1, 5.1.1.2 and 5.2 below. All such payments will be measured by the schedule of values established in paragraph 14.1 of the General Conditions.

5.1.1 For Cost of Work: Progress payments on account of the Cost of the Work will be made:

5.1.1.1 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 ENGINEER shall determine, or OWNER may withhold, including but not limited to liquidated damages, in accordance with paragraph 14.2 of the General Conditions.

90% of the work completed (with balance being retainage). If Work

has been 50% completed as determined by ENGINEER, and if the character and progress of the Work have been satisfactory to OWNER and ENGINEER, OWNER, on recommendation of ENGINEER, may determine that as long as the character and progress of the Work remain satisfactory to them, there will be no additional retainage on account of Work completed, in which case the remaining progress payments prior to Substantial Completion will be in an amount equal to 100% of the Work completed.

90% of the Cost of the Work (with the Balance being retainage) applicable to materials and equipment not incorporated in the Work (but delivered, suitably stored and accompanied by documentation satisfactory to OWNER as provided in paragraph 14.2 of the General Conditions).

5.1.1.2 Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to 100 percent of the Work completed, less 200 percent of the Market value of the Work remaining and less such amounts as Engineer shall determine in accordance with Paragraph 14.7 of the General Conditions.

5.2 Final Payment. Upon final completion and acceptance of the Work in accordance with paragraph 14.7 of the General Conditions, OWNER shall pay the remainder of the Contract Price as recommended by ENGINEER as provided in said paragraph 14.13.

Article 6. CONTRACTOR'S REPRESENTATIONS.

In order to induce OWNER to enter into this Agreement CONTRACTOR makes the following representations:

- 6.1 CONTRACTOR has familiarized itself with the nature and extent of the Contract Documents, Work, site, locality, and all local conditions and Laws and Regulations that in any manner may affect cost, progress, performance or furnishing of the Work.
- 6.2 CONTRACTOR has studied carefully all reports of explorations and tests of subsurface conditions and drawings of physical conditions which are identified in the Supplementary Conditions as provided in paragraph 4.2 of the General Conditions, and accepts the determination set forth in paragraph 5 of the Supplementary Conditions of the extent of the technical data contained in such reports and drawings upon which CONTRACTOR is entitled to reply.

- 6.3 CONTRACTOR has obtained and carefully studied (or assumes responsibility for obtaining and carefully studying) all such examinations, investigations, explorations, tests, reports and studies (in addition to or to supplement those referred to in paragraph 6.2 above) which pertain to the subsurface or physical conditions at or contiguous to the site or otherwise may affect the cost, progress, performance or furnishing of the Work as CONTRACTOR considers necessary for the performance or furnishing of the Work at the Contract Price, within the Contract Time and in accordance of paragraph 4.2 of the General Conditions; and no additional examinations, investigations, explorations, tests, reports, studies or similar information or data are or will be required by CONTRACTOR for such purposes.
- 6.4 CONTRACTOR has reviewed and checked all information and data shown or indicated on the Contract Documents with respect to existing Underground Facilities at or contiguous to the site and assumes responsibility for the accurate location of said Underground Facilities. No additional examinations, investigations, explorations, tests, reports, studies or similar information or data in respect of said Underground Facilities are or will be required by CONTRACTOR in order to perform and furnish the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of paragraph 4.3 of the General Conditions.
- 6.5 CONTRACTOR has correlated the results of all such observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the Contract Documents.
- 6.6 CONTRACTOR has given ENGINEER written notice of all conflicts, errors or discrepancies that he has discovered in the Contract Documents and the written resolution thereof by ENGINEER is acceptable to CONTRACTOR.

Article 7. CONTRACT DOCUMENTS.

- 7.1 This Agreement
- 7.2 Exhibits to this Agreement
- 7.3 Performance and other Bonds
- 7.4 Notice of Award
- 7.5 General Conditions
- 7.6 Supplementary Conditions

- 7.7 GEFA Supplemental General Conditions
- 7.8 Specifications bearing the title **Lift Stations 2, 6, and 26 Upgrades** consisting of divisions as listed in table of contents thereof.
- 7.9 Drawings, consisting of a cover sheet and sheets numbered C0.0 through ESC1, inclusive with each sheet bearing the following general title: **Lift Stations 2, 6, and 26 Upgrades**
- 7.10 Addenda numbers __ to __, inclusive.
- 7.11 CONTRACTOR's Bid
- 7.12 Documentation submitted by CONTRACTOR prior to Notice of Award.
- 7.13 The following which may be delivered or issued after the Effective Date of the Agreement and are not attached hereto: All Written Amendments and other documents amending, modifying, or supplementing the Contract Documents pursuant to paragraphs 3.4 and 3.5 of the General Conditions.
- 7.14 The documents listed in paragraphs 7.2 et seq. above are attached to this Agreement
(Except as expressly noted otherwise above).

There are no Contract Documents other than those listed above in this Article 7. The Contract Documents may only be amended, modified or supplemented as provided in paragraphs 3.4 and 3.5 of the General Conditions.

Article 8. MISCELLANEOUS

- 8.1 Terms used in this Agreement which are defined in Article 1 of the General Conditions will have the meanings indicated in the General Conditions.
- 8.2 No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically but without limitation moneys that may become due and moneys that are 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 Documents.

8.3 OWNER and CONTRACTOR each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representatives in respect of all covenants, agreements and obligations contained in the Contract Documents.

8.4 Any provision or part of the Contract documents held void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon OWNER and CONTRACTOR, who agree that the Contract documents shall 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.

Article 9. OTHER PROVISIONS.

IN WITNESS WHEREOF. OWNER and CONTRACTOR have signed this Agreement in four (4) counterparts. One counterpart each has been delivered to OWNER, CONTRACTOR and ENGINEER. All portions of the Contract Documents have been signed or identified by OWNER and CONTRACTOR or by ENGINEER on their behalf.

This Agreement will be effective on _____, 20__.

OWNER

CONTRACTOR

By _____

BY _____

[CORPORATE SEAL]

[CORPORATE SEAL]

Attest _____

Attest _____

Address for giving notices

Address for giving notices

City of Vidalia _____

302 E First Street Suite C, _____

Vidalia, GA 30474 _____

(If OWNER is a public body, attach evidence
License No. _____

of authority to sign and resolution or other documents authorizing execution of Agreement)

Agent for service of process: _____

(If CONTRACTOR is a corporation, attach evidence of authority to sign)

END OF SECTION

**SECTION 00610
PERFORMANCE BOND**

STATE OF GEORGIA

COUNTY OF TOOMBS

KNOW ALL MEN BY THESE PRESENTS, that we, _____

(Name and Address of Contractor)

as Principal (hereinafter known as "CONTRACTOR"), and
we, _____

(Name and Address of Surety)

as Surety, do hereby acknowledge ourselves indebted and firmly bound and held unto the
City of Vidalia.

(Name of Owner)

for the use and benefit of those entitled thereto, in the sum of _____
_____ Dollars (_____)

(Contract Sum)

for the payment of which well and truly to be made, in lawful money of the United States, we do
hereby bind ourselves, successors, assigns, heirs, and personal representatives.

BUT THE CONDITION OF THE FOREGOING OBLIGATION OR BOND IS THIS:

WHEREAS, the OWNER has engaged the said CONTRACTOR for the sum of _____
_____ Dollars (_____)

(Contract Sum)

for the construction of: **Lift Stations 2, 6, and 26 Upgrades**
(Name of Contract/Project)

as more fully appears in a written Agreement bearing the date of _____,
20____, a copy of which Agreement is by reference hereby made a part hereof.

NOW, THEREFORE, if said Contractor shall fully and faithfully perform all the undertakings and
obligations under the said agreement or contract hereinbefore referred to and shall fully

indemnify and save harmless the said OWNER from all costs and damage whatsoever which it may suffer by reason of any failure on the part of said CONTRACTOR to do so, and shall fully reimburse and repay the said default, and shall guarantee all products and workmanship against defects for a period of one year, then this obligation or bond shall be null and void, otherwise, it shall remain in full force and effect.

And for value received it is hereby stipulated and agreed that no change, extension of time, alteration or addition to the terms of the said Agreement or Contract or in the work to be performed there under, or the Specifications accompanying the same shall in any way affect the obligations under the obligation or bond, and notice is hereby waived of any such damage, extension of time, alteration or addition to the terms of the Agreement or Contract or to the work or to the Specifications.

This bond is given pursuant to and in accordance with the provisions of O.C.G.A. Section 36-91-40 et seq and 36-91-70 et seq and all the provisions of the law referring to this character of bond as set forth in said sections or as may be hereinafter enacted and these are hereby made a part hereof to the same extent as if set out herein in full.

IN WITNESS WHEREOF, the said CONTRACTOR has hereunder affixed its signature and said Surety has hereunto caused to be affixed its corporate signature and seal, by its duly authorized officers, on this ___ day of _____, 20___. Executed in 4 counterparts.

SECTION IS CONTINUED ON PAGE 3

CONTRACTOR: _____

Signed and sealed in
the presence of:

By: _____

1. _____

Title: _____

2. _____

(SEAL)

SURETY: _____

Signed and sealed in
the presence of:

By: _____

1. _____

Title: _____

2. _____

(SEAL)

- NOTE:
1. Date of bond must not be prior to date of contract. If CONTRACTOR is a PARTNERSHIP, all partners should execute bond.
 2. Surety companies executing bonds must appear on the Treasure Department's most current list (circular 570 as amended) and be authorized to transact business in the state where the PROJECT is located.

END OF SECTION

**SECTION 00615
PAYMENT BOND**

STATE OF GEORGIA

COUNTY OF TOOMBS

KNOW ALL MEN BY THESE PRESENTS, that we, _____

(Name and Address of Contractor)

as Principal (hereinafter known as "CONTRACTOR"), and we, _____

(Name and Address of Surety)

as Surety, do hereby acknowledge ourselves indebted and firmly bound and held unto the
City of Vidalia.

(Name of Owner)

for the use and benefit of those entitled thereto, in the sum of _____
_____ Dollars (_____)

(Contract Sum)

for the payment of which well and truly to be made, in lawful money of the United States, we do
hereby bind ourselves, successors, assigns, heirs, and personal representatives.

BUT THE CONDITION OF THE FOREGOING OBLIGATION OR BOND IS THIS:

WHEREAS, the OWNER has engaged the said CONTRACTOR for the sum of

_____ Dollars (_____)

(Contract Sum)

for the construction of: **Lift Stations 2, 6, and 26 Upgrades**

(Name of Contract/Project)

as more fully appears in a written Agreement bearing the date of _____,
20____, a copy of which Agreement is by reference hereby made a part hereof.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if said CONTRACTOR and all subcontractors to whom any portion of the work provided for in said Contract is sublet and all assignees of said Contractor and of such subcontractors shall promptly make payments to all persons supplying him or them with labor, products, services, or supplies for or in the prosecution of the work provided for in such Contract, or in any amendment or extension of or addition to said Contract, and for the payment of reasonable attorney's fees, incurred by the claimants in suits on this bond, then the above obligation shall be void; otherwise, it shall remain in full force and effect.

HOWEVER, this bond is subject to the following conditions and limitations:

(a) Any person, firm or corporation that has furnished labor, products, or supplies for or in the prosecution of the work provided for in said Contract shall have a direct right of action against the CONTRACTOR and Surety on this bond, which right of action shall be asserted in a proceeding, instituted in the County in which the work provided for in said Contract is to be performed or in any county in which Contractor or Surety does business. Such right of action shall be asserted in proceedings instituted in the name of the claimant or claimants for his or their use and benefit against said CONTRACTOR or Surety or either of them (but not later than one year after the final settlement of said Contract) in which action such claim or claims shall be adjudicated and judgment rendered thereon.

(b) The Principal and Surety hereby designate and appoint the _____, as the agent of each of them to receive and accept service of process or other pleading issued or filed in any proceeding instituted on this bond and hereby consent that such service shall be the same as personal service on the CONTRACTOR and/or Surety.

(c) In no event shall the Surety be liable for a greater sum than the penalty of this bond, or subject to any suit, action or proceeding thereon that is instituted later than one year after the final settlement of said Contract.

(d) This bond is given pursuant to and in accordance with provisions of O.C.G.A. Section 36-91-40 et seq and 36-91-90 et seq and all the provisions of law referring to this character of bond as set forth in said sections or as may be hereinafter enacted, and these are hereby made a part hereof to the same extent as if set out herein in full.

IN WITNESS WHEREOF, the said CONTRACTOR has hereunder affixed its signature and said Surety has hereunto caused to be affixed its corporate signature and seal, by its duly authorized officers,

on this __ day of _____, 20____. Executed in 4 counterparts.

CONTRACTOR: _____

Signed and sealed in
the presence of:

By: _____

1. _____

Title: _____

2. _____

(SEAL)

SURETY: _____

Signed and sealed in
the presence of:

By: _____

1. _____

Title: _____

2. _____

(SEAL)

- NOTE:
1. Date of bond must not be prior to date of contract. If CONTRACTOR is a PARTNERSHIP, all partners should execute bond.
 2. Surety companies executing bonds must appear on the Treasure Department's most current list (circular 570 as amended) and be authorized to transact business in the state where the PROJECT is located.

END OF SECTION

**SECTION 00621
NOTICE OF AWARD**

PROJECT DESCRIPTION:

Lift Stations 2, 6, and 26 Upgrades

The OWNER has considered the BID submitted by you for the above described WORK in response to its Advertisement for Bids dated _____, and Instruction to Bidders.

You are hereby notified that your BID has been accepted for items in the amount of _____ Dollars
(_____).

You are required by the Instructions to Bidders to execute the Agreement and furnish the required CONTRACTOR's Performance BOND, Payment BOND and Certificates of Insurance with fifteen (15) calendar days from the date of the Notice to you.

If you fail to execute said Agreement and to furnish said BONDS within fifteen (15) days from the date of this notice, said OWNER will be entitled to consider all your rights arising out of the OWNER'S acceptance of your BID as abandoned and as a forfeiture of your BID BOND. The OWNER will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this NOTICE of AWARD to the OWNER.

Dated this ____ day of _____, 20__.

City of Vidalia
OWNER

By: _____

Title: _____

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE OF AWARD is hereby acknowledged by
_____ this ____ day of _____, 20__.
(Contractor)

By: _____

Title: _____

**SECTION 00622
NOTICE TO PROCEED**

To: _____ Date: _____
_____ Project: _____

You are hereby notified to commence WORK in accordance with the Agreement dated _____, on or before _____, and you are to complete the WORK within 300 consecutive calendar days thereafter. The date of completion of all WORK is therefore _____.

City of Vidalia
OWNER

By _____

Title: _____

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE
TO PROCEED is hereby
acknowledged by

this the ____ day of _____, 20__

By _____

Title _____

**SECTION 00700
GENERAL CONDITIONS**

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**SECTION 00700
GENERAL CONDITIONS**

ARTICLE 1 - DEFINITIONS

Wherever used in these General Conditions or in the other Contract Documents the following terms have the meanings indicated which are applicable to both the singular and plural thereof:

Addenda - Written or graphic instruments issued prior to the opening of Bids which clarify, correct or change the bidding documents or the Contract Documents.

Agreement - The written agreement between OWNER and CONTRACTOR covering the Work to be performed; other Contract Documents are attached to the Agreement and made a part thereof as provided therein.

Application for Payment - The form accepted by ENGINEER which is to be used by CONTRACTOR in requesting progress for final payments and which is to include such supporting documentation as is required by the Contract Documents.

Bid - The offer or proposal of the bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

Bonds - Bid, performance and payment bonds and other instruments of security.

Change Order - A document recommended by ENGINEER, 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 Time, issued on or after the

Effective Date of the Agreement.

Contract Documents - The Agreement, Addenda (which pertain to the Contract Documents), CONTRACTOR'S Bid (including documentation accompanying the Bid and any post-Bid documentation submitted prior to the Notice of Award) when attached as an exhibit to the Agreement, the Bonds, these General Conditions, the Supplementary Conditions, the Specifications and the Drawings as the same are more specifically identified in the Agreement, together with all amendments, modifications and supplements issued pursuant to paragraphs 3.4 and 3.5 on or after the Effective Date of the Agreement.

Contract Price - The moneys payable by OWNER to CONTRACTOR under the Contract Documents as stated in the Agreement (subject to the provisions of paragraph 11.9.1 in the case of Unit Price Work).

Contract Time - The number of days (computed as provided in paragraph 17.2) or the date stated in the Agreement for the completion of the Work.

CONTRACTOR - The person, firm or corporation with whom OWNER has entered into the Agreement.

Defective - An adjective which when modifying the word Work refers to Work that is unsatisfactory, faulty or deficient, or does not conform to the Contract Documents, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the Contract Documents, or 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 14.8 or 14.10).

Drawings - The drawings which show the character and scope of the Work to be performed and which have been prepared or approved by ENGINEER and are referred to in the Contract Documents.

Effective Date of the Agreement - The date indicated in the Agreement on which it becomes effective, but if no such date is indicated it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

ENGINEER - The person, firm or corporation named as such in the Agreement.

Field Order - A written order issued by ENGINEER which orders minor changes in the Work in accordance with paragraph 9.5 but which does not involve a change in the Contract Price or the Contract Time.

General Requirements - Sections of Division 1 of the Specifications.

Laws and Regulations; Laws or Regulations - Laws, rules, regulations, ordinances, codes and/or orders.

Notice of Award - The written notice by OWNER to the apparent successful bidder stating that upon compliance by the apparent successful bidder with the conditions precedent enumerated therein, within the time specified, OWNER will sign and deliver the Agreement.

Notice to Proceed - A written notice given by OWNER to CONTRACTOR (with a copy to ENGINEER) fixing the date on which the Contract Time will commence to run and on which CONTRACTOR shall start to perform CONTRACTOR's obligations under the Contract Documents.

OWNER - The public body or authority, corporation, association, firm or person with whom CONTRACTOR has entered into the Agreement and for whom the Work is to be provided.

Partial Utilization - Placing a portion of the Work in service for the purpose for which it is intended (or a related purpose) before reaching Substantial Completion for all the Work.

Project - The total construction of which the Work to be provided under the Contract Documents may be the whole, or a part as indicated elsewhere in the Contract Documents.

Resident Project Representative - The authorized representative of ENGINEER who is assigned to the site or any part thereof.

Shop Drawings - All drawings, diagrams, illustrations, schedules and other data which are specifically prepared by or for CONTRACTOR to illustrate some portion of the Work and all illustrations, brochures, standard schedules, performance charts, instructions, diagrams and other information prepared by a Supplier and submitted by CONTRACTOR to illustrate material or equipment for some portion of the Work.

Specifications - Those portions of the Contract Documents consisting of written technical descriptions of materials, equipment, construction systems, standards and workmanship as applied to the Work and certain administrative details applicable thereto.

Subcontractor - An individual, firm or corporation having a direct contract with CONTRACTOR or with any other Subcontractor for the performance of a part of the Work at the site.

Substantial Completion - The Work (or a specified part thereof) has progressed to the point where, in the opinion of ENGINEER as evidenced by ENGINEER's definitive certificate of Substantial Completion, it is sufficiently complete, in accordance with the Contract Documents, so that the Work (or specified part) can be utilized for the purposes for which it is intended; or if there be no such certificate issued, when final payment is due in accordance with paragraph 14.13. The terms "substantially complete" and "substantially completed" as applied to any Work refer to Substantial Completion thereof.

Supplementary Conditions - The part of the Contract Documents which amends or supplements these General Conditions.

Supplier - A manufacturer, fabricator, supplier, distributor, materialman or vendor.

Underground Facilities - All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks tunnels or other such facilities or attachments, and any encasements containing such facilities which have been installed underground to furnish any of the following services or materials; electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, sewage and drainage removal, traffic or other control systems or water.

Unit Price Work - Work to be paid for on the basis of unit prices.

Work - The entire completed construction or the various separately identifiable parts thereof required to be furnished under the Contract Documents. Work is the result of performing services, furnishing labor and furnishing and incorporating materials and equipment into the construction, all as

required by the Contract Documents.

Work Directive Change - A written directive to CONTRACTOR, issued on or after the Effective Date of the Agreement and signed by OWNER and recommended by ENGINEER, ordering and addition, deletion or revision in the Work, or responding to differing or unforeseen physical conditions under which the Work is to be performed as provided in paragraph 4.2 or 4.3 or to emergencies under paragraph 6.22. A Work Directive Change may not change the Contract Price or the Contract Time, but is evidence that the parties expect that the change directed or documented by a Work Directive Change will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Time as provided in paragraph 10.2.

Written Amendment - A written amendment of the Contract Documents, signed by OWNER and CONTRACTOR on or after the Effective Date of the Agreement and normally dealing with the nonengineering or nontechnical rather than strictly Work-related aspects of the Contract Documents.

ARTICLE 2 - PRELIMINARY MATTERS

Delivery of Bonds:

2.1 When CONTRACTOR delivers the executed Agreements to OWNER, CONTRACTOR shall also deliver to OWNER such Bonds as CONTRACTOR may be required to furnish in accordance with paragraph 5.1.

Copies of Documents:

2.2 OWNER shall furnish to CONTRACTOR up to ten copies (unless otherwise specified in the Supplementary Conditions) of the Contract Documents as are reasonably necessary for the execution of the Work. Additional Copies will be furnished, upon request, at the cost of reproduction.

Commencement of Contract Time; Notice to Proceed:

2.3 The Contract Time will commence to run on the thirtieth day after the Effective Date of the Agreement, 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 thirty days after the Effective Date of the Agreement. In no event will the Contract Time commence to run later than the seventy-fifth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

Starting the Project:

2.4 CONTRACTOR shall start to perform the Work on the date when the Contract Time commences to run, but no Work shall be done at the site prior to the date on which the Contract Time commences to run.

Before Starting Construction:

2.5 Before undertaking each part of the Work, CONTRACTOR shall carefully study and compare the Contract Documents and check and verify pertinent figures shown thereon and all applicable field measurements. CONTRACTOR shall promptly report in writing to ENGINEER any conflict,

error or discrepancy which CONTRACTOR may discover and shall obtain a written interpretation or clarification from ENGINEER before proceeding with any Work affected thereby; however, CONTRACTOR shall not be liable to OWNER or ENGINEER for failure to report any conflict, error or discrepancy in the Contract Documents, unless CONTRACTOR had actual knowledge thereof or should reasonably have known thereof.

2.6 Within ten days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), CONTRACTOR shall submit to ENGINEER for review:

2.6.1 a preliminary Progress Schedule;

2.6.2 a preliminary Schedule of Submittals; and

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

2.7 Before any Work at the site is started, CONTRACTOR shall deliver to OWNER, with a copy to ENGINEER, certificates (and other evidence of insurance requested by OWNER) which CONTRACTOR is required to purchase and maintain in accordance with paragraphs 5.3 and 5.4.,

and OWNER shall deliver to CONTRACTOR certificates (and other evidence of insurance requested by CONTRACTOR) which OWNER is required to purchase and maintain in accordance with paragraphs 5.6 and 5.7.

Preconstruction Conference:

Initial Acceptance of Schedules:

2.8 At least 10 days before submission of the first Application for Payment a conference attended by Contractor, Engineer, and others as appropriate will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.6. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.

2.8.1 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.

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

2.8.3 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 component parts of the Work.

ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

Intent:

3.1 The Contract Documents comprise the entire agreement between OWNER and CONTRACTOR concerning the Work. The Contract Documents are complementary; what is called for by one is as binding as if called for by all. The Contract Documents will be construed in accordance with the law of the place of the Project.

3.2 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. Any Work, materials or equipment that may reasonably be inferred from the Contract Documents as being required to produce the intended result will be supplied whether or not specifically called for. When words which have a well-known technical or trade meaning are used to describe Work, materials or equipment such words shall be interpreted in accordance with that meaning. Reference to standard specifications, manuals or codes of any technical society, organization or association, or to the Laws or Regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard specification, manual, code or Laws or Regulations in effect at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated. However, no provision of

any referenced standard specification, manual or code (whether or not specifically incorporated by reference in the Contract Documents) shall be effective to change the duties and responsibilities of OWNER, CONTRACTOR or ENGINEER, or any of their consultants, agents or employees from those set forth in the Contract Documents, nor shall it be effective to assign to ENGINEER, or any of ENGINEER's consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 9.15 or 9.16. Clarifications and interpretations of the Contract Documents shall be issued by ENGINEER as provided in paragraph 9.4.

3.3 If, during the performance of the Work, CONTRACTOR finds a conflict, error or discrepancy in the Contract Documents, CONTRACTOR shall so report to ENGINEER in writing at once and before proceeding with the Work affected thereby shall obtain a written interpretation or clarification from ENGINEER; however, CONTRACTOR shall not be liable to OWNER or ENGINEER for failure to report any conflict, error or discrepancy in the Contract Documents unless CONTRACTOR had actual knowledge thereof or should reasonable have known thereof.

Amending and Supplementing Contract Documents:

3.4 The Contract Documents may be amended to provide for additions, deletions and revisions in the Work or to modify the terms and conditions thereof in one or more of the following ways:

3.4.1 a formal Written Amendment,

3.4.2 a Change Order (pursuant to paragraph 10.4), or

3.4.3 a Work Directive Change (pursuant to paragraph 10.1).

As indicated in paragraphs 11.2 and 12.1, Contract Price and Contract Time may only be changed by a Change Order or a Written Amendment.

3.5 In addition, the requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, in one or more of the followings ways:

3.5.1 a Field Order (pursuant to paragraph 9.5),

3.5.2 ENGINEER's approval of a Shop Drawing or sample (pursuant to paragraphs 6.26 and 6.27), or

3.5.3 ENGINEER's written interpretation or clarification (pursuant to paragraph 9.4).

Reuse of Documents:

3.6 Neither CONTRACTOR nor any Subcontractor or Supplier or other person or organization performing or furnishing any of the Work under a direct or indirect contract with OWNER shall 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; and they shall not reuse any of them on extensions of the Project or any other project without written consent of OWNER and ENGINEER and specific written verification or adaptation by ENGINEER.

ARTICLE 4 - AVAILABILITY OF LANDS;
PHYSICAL CONDITIONS; REFERENCE POINTS

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Availability of Lands:

4.1 OWNER shall furnish, as indicated in the Contract Documents, the lands upon which the Work is to be performed, rights-of-way and easements for access thereto, and such other lands which are designated for the use of CONTRACTOR. Easements for permanent structures or permanent changes in existing facilities will be obtained and paid for by OWNER, unless otherwise provided in the Contract Documents. If CONTRACTOR believes that any delay in OWNER's furnishing these lands, rights-of-way or easements entitles CONTRACTOR to an extension of the Contract Time, CONTRACTOR may make a claim therefore as provided in Article 12. CONTRACTOR shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

Physical Conditions:

4.2.1 *Explorations and Reports:* Reference is made to the Supplementary Conditions for identification of those reports of explorations and tests of subsurface conditions at the site that have been utilized by ENGINEER in preparation of the Contract Documents. CONTRACTOR may rely upon the accuracy of the technical data contained in such reports, but not upon nontechnical data, interpretations or opinions contained therein or for the completeness thereof for CONTRACTOR's purposes. Except as

indicated in the immediately preceding sentence and in paragraph 4.2.6, CONTRACTOR shall have full responsibility with respect to subsurface conditions at the site.

4.2.2 *Existing Structures:* Reference is made to the Supplementary Conditions for identification of those drawings of physical conditions in or relating to existing surface and subsurface structures (except Underground Facilities referred to in paragraph 4.3) which are at our contiguous to the site that have been utilized by ENGINEER in preparation of the Contract Documents. CONTRACTOR may rely upon the accuracy of the technical data contained in such drawings, but not for the completeness thereof for CONTRACTOR's purposes. Except as indicated in the immediately preceding sentence and in paragraph 4.2.6, CONTRACTOR shall have full responsibility with respect to physical conditions in or relating to such structures.

4.2.3 *Report of Differing Conditions:* If CONTRACTOR believes that:

4.2.3.1 any technical data on which CONTRACTOR is entitled to rely as provided in paragraphs 4.2.1 and 4.2.2 is inaccurate, or

4.2.3.2 any physical condition uncovered or revealed at the site differs materially from that indicated, reflected or referred to in the Contract Documents,

CONTRACTOR shall, promptly after becoming aware thereof and before performing any Work in connection therewith (except in an emergency as permitted by paragraph 6.22), notify OWNER and ENGINEER in writing about the inaccuracy or difference.

4.2.4 *ENGINEER's Review:* ENGINEER will promptly review the pertinent conditions, determine the necessity of obtaining additional explorations or tests with respect thereto and advise OWNER in Writing (with a copy to CONTRACTOR) of ENGINEER's findings and conclusions.

4.2.5 *Possible Document Change:* IF ENGINEER concludes that there is a material error in the Contract Documents or that because of newly discovered conditions a change in the Contract Documents is required, a Work Directive Change or a change Order will be issued as provided in Article 10 to reflect and document the consequences of the inaccuracy or difference.

4.2.6 *Possible Price and Time Adjustments:* In each such case, an increase or decrease in the Contract Price or an extension or shortening of the Contract Time, or any combination thereof, will be allowable to the extent that they are attributable to any such inaccuracy of difference. If OWNER and CONTRACTOR are unable to agree as to the amount or length thereof, a claim may be made therefore as provided in Articles 11 and 12.

Physical Conditions - Underground Facilities:

4.3.1 *Shown or Indicated:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the site is based on information and data furnished to OWNER or ENGINEER by the owners of such Underground Facilities or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

4.3.1.1 OWNER and ENGINEER

shall not be responsible for the accuracy or completeness or any such information or data; and,

4.3.1.2 CONTRACTOR shall have full responsibility for reviewing and checking all such information and data, for locating all Underground Facilities shown or indicated in the Contract Documents, for coordination of the Work with the owners of such Underground Facilities during construction, for the safety and protection thereof as provided in paragraph 6.20 and repairing any damage thereto resulting from the Work, the cost of all of which will be considered as having been included in the Contract Price.

4.3.2 *Not Shown or Indicated.* If an Underground Facility is uncovered or revealed at or contiguous to the site which was not shown or indicated in the Contract Documents and which CONTRACTOR could not reasonably have been expected to be aware of, CONTRACTOR shall, promptly after becoming aware thereof and before performing any Work affected thereby (except in an emergency as permitted by paragraph 6.22), identify the owner of such Underground Facility and give written notice thereof to that owner and to OWNER and ENGINEER. ENGINEER will promptly review the Underground Facility to determine the extent to which the Contract Documents should be modified to reflect and document the consequences of the existence of the Underground Facility, and the Contract Documents will be amended or supplemented to the extent necessary. During such time, CONTRACTOR shall be responsible for the safety and protection of such Underground Facility as provided in paragraph 6.20. CONTRACTOR shall be

allowed an increase in the Contract Price or an extension of the Contract Time, or both, to the extent that they are attributable to the extent to the existence of any Underground Facility that was not shown or indicated in the Contract Documents and which CONTRACTOR could not reasonably have been expected to be aware of. If the parties are unable to agree as to the amount or length thereof, CONTRACTOR may make a claim therefore as provided in Articles 11 and 12.

Reference Points:

4.4 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 (unless otherwise specified in the General Requirements), shall protect and preserve the established reference points and shall make no changes or relocations without the prior written approval of OWNER. CONTRACTOR shall report to ENGINEER whenever an reference point 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 by professionally qualified personnel.

ARTICLE 5 - BONDS AND INSURANCE

Performance and Other Bonds:

5.1 CONTRACTOR shall furnish performance and payment Bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and

payment of all CONTRACTOR's obligations under the Contract Documents. These Bonds shall remain in effect at least until one year after the date when final payment becomes due, except as otherwise provided by Law or Regulation or by the Contract Documents. CONTRACTOR shall also furnish such other Bonds as are required by the Supplementary Conditions. All Bonds shall be in the forms prescribed by Law or Regulation or by the Contract Documents and be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Audit Staff Bureau of Accounts, U.S. Treasury Department. All Bonds signed by an agent must be accompanied by a certified copy of the authority to act.

5.2 If the surety on any Bond furnished by CONTRACTOR is declared a bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of paragraph 5.1, CONTRACTOR shall within five days thereafter substitute another Bond and Surety, both of which must be acceptable to OWNER.

Contractor's Liability Insurance:

5.3 CONTRACTOR shall purchase and maintain such comprehensive general liability and other insurance as is appropriate for the Work being performed and furnished and as will provide protection from claims set forth below which may arise out of or result from CONTRACTOR's performance and furnishing of the Work and CONTRACTOR's other obligations under the Contract Documents, whether it is to be performed or

furnished by CONTRACTOR, by any Subcontractor, by anyone directly or indirectly employed by any of them to perform or furnish any of the Work, or by anyone for whose acts any of them may be liable.

5.3.1 Claims under workers' or workmen's compensation, disability benefits and other similar employee benefit acts;

5.3.2 Claims for damages because of bodily injury occupational sickness or disease, or death on CONTRACTOR's employees;

5.3.3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than CONTRACTOR's employees;

5.3.4 Claims for damages insured by personal injury liability coverage which are sustained (a) by any person as a result of an offense directly or indirectly related to the employment of such person by CONTRACTOR, or (b) by any other person for any other reason;

5.3.5 Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting there from;

5.3.6 Claims arising out of operation of Laws or Regulations for damages because of bodily injury or death of any person or for damage to property; and

5.3.7 Claims for damages because of bodily injury or death of any person or property damage arising

out of the ownership, maintenance or use of any motor vehicle.

The insurance required by this paragraph 5.3 shall include the specific coverages and be written for not less than the limits of liability and coverages provided in the Supplementary Conditions, or required by law, whichever is greater. The comprehensive general liability insurance shall include completed operations insurance. All of the policies of insurance so required to be purchased and maintained (or the certificates or other evidence thereof) shall contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least thirty days' prior written notice has been given to OWNER and ENGINEER by certified mail. All such insurance shall remain in effect until final payment and at all times thereafter when CONTRACTOR may be correcting, removing or replacing *defective* Work in accordance with paragraph 13.12. In addition, CONTRACTOR shall maintain such completed operations insurance for at least two years after final payment and furnish OWNER and with evidence of continuation of such insurance at final payment and one year thereafter.

Contractual Liability Insurance:

5.4 The comprehensive general liability insurance required by paragraph 5.3 will include contractual liability insurance applicable to CONTRACTOR's obligations under paragraphs 6.30 and 6.31.

Owner's Liability Insurance:

5.5 OWNER shall be responsible for purchasing and maintaining OWNER's own

liability insurance and, at OWNER's option, may purchase and maintain such insurance as will protect OWNER against claims which may arise from operations under the Contract Documents.

Property Insurance:

5.6 Unless otherwise provided in the Supplementary Conditions, CONTRACTOR shall purchase and maintain property insurance upon the Work at the site to the full insurable value thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall include the interests of OWNER, CONTRACTOR, Subcontractors, ENGINEER and ENGINEER's consultants in the Work, all of whom shall be listed as insured or additional insured parties, shall insure against the perils of fire and extended coverage and shall include "all risk" insurance for physical loss and damage including theft, vandalism and malicious mischief, collapse and water damage, and such other perils as may be provided in the Supplementary Conditions, and shall include damages, losses and expenses arising out of or resulting from any insured loss or incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers, architects, attorneys and other professionals). If not covered under the "all risk" insurance or otherwise provided in the Supplementary Conditions, CONTRACTOR shall purchase and maintain similar property insurance on portions of the Work stored on and off the site or in transit when such portions of the Work are to be included in an Application for Payment.

5.7 OWNER shall purchase and maintain such boiler and machinery insurance or

additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of OWNER, CONTRACTOR, Subcontractors, ENGINEER and ENGINEER's consultants in the Work, all of whom shall be listed as insured or additional insured parties.

5.8 All the policies of insurance (or the certificates or other evidence thereof) required to be purchased and maintained by CONTRACTOR in accordance with paragraphs 5.6 and 5.7 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least thirty days' prior written notice has been given to OWNER by certified mail and will contain waiver provisions in accordance with paragraph 5.11.2.

5.9 OWNER shall not be responsible for purchasing and maintaining any property insurance to protect the interests of CONTRACTOR, Subcontractors or others in the Work to the extent of any deductible amounts that are provided in the Supplementary Conditions. The risk of loss within the deductible amount, will be borne by CONTRACTOR, Subcontractor or others suffering any such loss and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

5.10 If OWNER requests in writing that other special insurance be included in the property insurance policy, CONTRACTOR shall, if possible, include such insurance, and the cost thereof will be charged to CONTRACTOR by appropriate Change Order or Written Amendment. Prior to commencement of the Work at the site, CONTRACTOR shall in writing advise OWNER

whether or not such other insurance has been procured by CONTRACTOR.

Waiver of Rights:

5.11.1 OWNER and CONTRACTOR waive all rights against each other for all losses and damages caused by any of the perils covered by the policies of insurance provided in response to paragraphs 5.6 and 5.7 and any other property insurance applicable to the Work, and also waive all such rights against the Subcontractors, ENGINEER, ENGINEER's consultants and all other parties names as insured in such policies for losses and damages so caused. As required by paragraph 6.11, each subcontract between CONTRACTOR and a Subcontractor will contain similar waiver provisions by the Subcontractor in favor of OWNER, CONTRACTOR, ENGINEER, ENGINEER's consultants and all other parties named as insured. None of the above waivers shall extend to the rights that any of the insured parties may have to the proceeds of insurance held by OWNER as trustee or otherwise payable under any policy so issued.

5.11.2 OWNER and CONTRACTOR intend that any policies provided in response to paragraphs 5.6 and 5.7 shall protect all of the parties insured and provide primary coverage for all losses and damages caused by the perils covered thereby. Accordingly, all such policies shall 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 of the parties named as insureds or additional insureds, and if the insurers require separate waiver forms to be signed by ENGINEER or ENGINEER's consultant OWNER will obtain the same, and if such waiver forms are required of any Subcontractor, CONTRACTOR will obtain the same.

Receipt and Application of Proceeds:

5.12 Any insured loss under the policies of insurance required by paragraphs 5.6 and 5.7 will be adjusted with OWNER and made payable to OWNER as trustee for the insureds, as their interests may appear, subject to the requirements of any applicable mortgage clause and of paragraph 5.13. OWNER shall deposit in a separate account any money so received, and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof and the Work and the cost thereof covered by an appropriate Change Order or Written Amendment.

5.13 OWNER as trustee shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within fifteen days after the occurrence of loss to OWNER's exercise of this power. If such objection be made, OWNER as trustee shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If required in writing by any party in interest, OWNER as trustee shall, upon the occurrence of an insured loss, give bond for the proper performance of such duties.

Acceptance of Insurance:

5.14 If OWNER has any objection to the coverage afforded by or other provisions of the insurance required to be purchased and maintained by CONTRACTOR in accordance with paragraphs 5.3 and 5.4 on the basis of

its not complying with the Contract Documents, OWNER shall notify CONTRACTOR in writing thereof within ten days of the date of delivery of such certificates to OWNER in accordance with paragraph 2.7. If CONTRACTOR has any objection to the coverage afforded by or other provisions of the policies of insurance required to be purchased and maintained by OWNER in accordance with paragraphs 5.6 and 5.7 on the basis of their not complying with the Contract Documents, CONTRACTOR shall notify OWNER in writing thereof within ten days of the date of delivery of such certificates to CONTRACTOR in accordance with paragraph 2.7 OWNER and CONTRACTOR shall each provide to the other such additional information in respect of insurance provided by each as the other may reasonably request. Failure by OWNER or CONTRACTOR to give any such notice of objection within the time provided shall constitute acceptance of such insurance purchased by the other as complying with the Contract Documents.

Partial Utilization - Property Insurance:

5.15 If OWNER finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, such use or occupancy may be accomplished in accordance with paragraph 14.10; provided that no such use or occupancy shall commence before the insurers providing the property insurance have acknowledge notice thereof and in writing effected the changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or lapse on account of any such partial use or occupancy.

ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES

Supervision and Superintendence:

6.1 CONTRACTOR shall supervise and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. CONTRACTOR shall be solely responsible for the means, methods, techniques, sequences and procedures of construction, but CONTRACTOR shall not be responsible for the negligence of others in the design or selection of a specific means, method, technique, sequence or procedure of construction which is indicated in and required by the Contract Documents. CONTRACTOR shall be responsible to see that the finished Work complies accurately with the Contract Documents.

6.2 CONTRACTOR shall keep on the Work at all times during its progress a competent resident superintendent, who shall not be replaced without written notice to OWNER and ENGINEER except under extraordinary circumstances. The superintendent will be CONTRACTOR's representative at the site and shall have authority to act on behalf of CONTRACTOR. All communications given to the superintendent shall be as binding as if given to CONTRACTOR.

Labor, Materials and Equipment:

6.3 CONTRACTOR shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract

Documents. CONTRACTOR shall at all times maintain good discipline and order at the site. Except in connection with the safety or protection of persons or the Work or property at the site or adjacent thereto, and except as otherwise indicated in the Contract Documents, all Work at the site shall be performed during regular working hours, and CONTRACTOR will not permit overtime work or the performance of Work on Saturday, Sunday or any legal holiday without OWNER's written consent give after prior written notice to ENGINEER.

6.4 Unless otherwise specified in the General Requirements, CONTRACTOR shall furnish and assume full responsibility for all 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 furnishing, performance, testing, start-up and completion of the Work.

6.5 All materials and equipment shall be of good quality and new, except as otherwise provided in the Contract Documents. If required by ENGINEER, CONTRACTOR shall furnish satisfactory evidence (including reports of required tests) as to the kind and quality of materials and equipment. All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the instruction of the applicable Supplier except as otherwise provided in the Contract Documents; but no provision of any such instructions will be effective to assign to ENGINEER, or any of ENGINEER's consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the

provisions of paragraph 9.15 or 9.16.

Adjusting Progress Schedule:

6.6 CONTRACTOR shall submit to ENGINEER for acceptance (to the extent indicated in paragraph 2.9) adjustments in the progress schedule to reflect the impact thereon of new developments; these will conform generally to the progress schedule then in effect and additionally will comply with any provisions of the General Requirements applicable thereto.

Substitutes or "Or-Equal" Items:

6.7.1 Whenever materials or equipment are specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier the naming of the item is intended to establish the type, function and quality required. In the case where the name is followed by words indicating that substitutions/ "or equals" are permitted, materials or equipment of other Suppliers may be accepted by ENGINEER if sufficient information is submitted by BIDDER to allow ENGINEER to determine that the material or equipment proposed is equivalent or equal to that named. The procedure for review by ENGINEER will include the following as supplemented in the General Requirements. Requests for review of substitute/ "or-equal" items of material and equipment will not be accepted by ENGINEER from anyone other than BIDDER. If BIDDER wishes to furnish or use a substitute/ "or-equal" item of material or equipment, BIDDER shall make written application to ENGINEER for acceptance thereof, certifying that the proposed substitute/ "or-equal" or will perform adequately the functions and achieve the results called for by the general design, be similar and of equal substance to

that specified and be suited to the same use as that specified. The application will state that the evaluation and acceptance of the proposed substitute/ "or-equal" item will not prejudice BIDDER'S achievement of Substantial Completion on time, whether or not acceptance of the substitute/ "or-equal" item for use 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 work on the Project) to adapt the design to the proposed item and whether or not incorporation or use of the item in connection with the Work is subject to payment of any license fee or royalty. All variations of the proposed substitute/ "or-equal" item from that specified will be identified in the application and available maintenance repair and replacement service will be indicated. The application will also contain an itemized estimate of all costs that will result directly or indirectly from acceptance of such item, including costs for redesign and claims of other contractors affected by the resulting change, all of which shall be considered by ENGINEER in evaluating the proposed substitute/ "or-equal" item. ENGINEER may require BIDDER to furnish at BIDDER'S expense additional data about the proposed substitute/ "or-equal" item.

6.7.2 If a specific means, method, technique, sequence or procedure of construction is indicated in or required by the Contract Documents, BIDDER may furnish or utilize a substitute/ "or-equal" means, method, sequence, technique or procedure of construction acceptable to ENGINEER, if BIDDER submits sufficient information to allow ENGINEER to determine that the substitute/ "or-equal" item proposed is equivalent to that indicated or required by the Contract Documents. The procedure for review by ENGINEER will be similar to that provided in paragraph 6.7.1 as

applied by ENGINEER and as may be supplemented in the General Requirements.

6.7.3 ENGINEER will be allowed a reasonable time within which to evaluate each proposed substitute/ "or equal" item. ENGINEER will be the sole judge of acceptability, and no item will be ordered, installed or utilized without ENGINEER's prior written acceptance which will be evidenced by either a Change Order or an approved Shop Drawing. OWNER may require BIDDER to furnish at BIDDER's expense a special performance guarantee or other surety with respect to any substitute/ "or-equal" item. ENGINEER will record time required by ENGINEER and ENGINEER's consultants in evaluating items proposed by BIDDER and in making changes in the Contract Documents occasioned thereby. Whether or not ENGINEER accepts a proposed substitute/ "or-equal" item, BIDDER shall reimburse OWNER for the charges of ENGINEER and ENGINEER's consultants for evaluating each proposed item.

Concerning Subcontractors, Suppliers and Others:

6.8.1 CONTRACTOR shall not employ any Subcontractor, Supplier or other person or organization (including those acceptable to OWNER and ENGINEER as indicated in paragraph 6.8.2), whether initially or as a substitute, against whom OWNER or ENGINEER may have reasonable objection. CONTRACTOR shall not be required to employ any Subcontractor, Supplier or other person or organization to furnish or perform any of the Work against whom CONTRACTOR has reasonable objection.

6.8.2 If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers or other persons

or organizations (including those who are to furnish the principal items of materials and equipment) to be submitted to OWNER in advance of the specified date prior to the Effective Date of the Agreement for acceptance by OWNER and ENGINEER and if CONTRACTOR has submitted a list thereof in accordance with the Supplementary Conditions, OWNER's or ENGINEER's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the bidding documents or the Contract Documents) of any such Subcontractor, Supplier or other person or organization so identified may be revoked on the basis of reasonable objection after due investigation, in which case CONTRACTOR shall submit an acceptable substitute/ "or-equal" item, the Contract Price will be increased by the difference in the cost occasioned by such substitution and an appropriate Change Order will be issued or Written Amendment signed. No acceptance by OWNER or ENGINEER of any such Subcontractor, Supplier or other person or organization shall constitute a waiver of any right of OWNER or ENGINEER to reject *defective* Work.

6.9 CONTRACTOR shall be fully responsible to OWNER and ENGINEER for all acts and omissions of the Subcontractors, Suppliers and other persons and organization performing or furnishing any of the Work under a direct or indirect contract with CONTRACTOR just as CONTRACTOR is responsible for CONTRACTOR's own acts and omissions. Nothing in the Contract Documents shall create any contractual relationship between OWNER or ENGINEER and any such Subcontractor, Supplier or other person or organization, nor shall it create any obligation on the part of OWNER or ENGINEER to pay or to see to the payment of any moneys due any such

Subcontractor, Supplier or other person or organization except as may other wise be required by Laws and Regulations.

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

6.11 All Work performed for CONTRACTOR by a Subcontractor will be pursuant to an appropriate agreement between CONTRACTOR and the Subcontractor which specifically binds the Subcontractor to the applicable terms and conditions of the Contract Documents for the benefit of OWNER and ENGINEER and contains waiver provisions as required by paragraph 5.11. CONTRACTOR shall pay each Subcontractor a just share of any insurance moneys received by CONTRACTOR on account of losses under policies issued pursuant to paragraphs 5.6 and 5.7.

Patent Fees and Royalties:

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

and ENGINEER and anyone directly or indirectly employed by either of them from and against all claims, damages, losses and expenses (including attorneys' fees and court and arbitration costs) arising out of any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product or device not specified in the Contract Documents, and shall defend all such claims in connection with any alleged infringement of such rights.

Permits:

6.13 Unless otherwise provided in the Supplementary Conditions, CONTRACTOR shall obtain and pay for all construction permits and licenses. OWNER shall assist CONTRACTOR, when necessary, in obtaining such permits and licenses. CONTRACTOR shall pay all governmental charges and inspection fees necessary for the prosecution of the Work, which are applicable at the time of opening the Bids, or if there are no Bids on the Effective Date of the Agreement. CONTRACTOR shall pay all charges of utility owners for connections to the Work, and OWNER shall pay all charges of such utility owners for capital costs related thereto such as plant investment fees.

Laws and Regulations:

6.14.1 CONTRACTOR shall give all notices and comply with all Laws and Regulations applicable to furnishing and performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither OWNER nor ENGINEER shall be responsible for monitoring CONTRACTOR's compliance with any Laws or Regulations.

6.14.2 If CONTRACTOR observes that the Specifications or Drawings are at variance with any Laws or Regulations, CONTRACTOR shall give ENGINEER prompt written notice thereof, and any necessary changes will be authorized by one of the methods indicated in paragraph 3.4. If CONTRACTOR performs any Work knowing or having reason to know that it is contrary to such Laws or Regulations, and without such notice to ENGINEER, CONTRACTOR shall bear all costs arising therefrom; however, it shall not be CONTRACTOR's primary responsibility to make certain that the Specifications and Drawings are in accordance with such Laws and Regulations.

Taxes:

6.15 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.

Use of Premises:

6.16 CONTRACTOR shall confine construction equipment, the storage of materials and equipment and the operations of workers to the Project site and land and areas identified in and permitted by the Contract Documents and other land and areas permitted by Laws and Regulations, rights-of-way, permits and easements, and shall not unreasonably encumber the premises which construction equipment or other materials or equipment. CONTRACTOR shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof or of any land or areas contiguous thereto, resulting from the

performance of the Work. Should any claim be made against OWNER or ENGINEER by any such owner or occupant because of the performance of the Work, CONTRACTOR shall promptly attempt to settle with such other party by agreement or otherwise resolve the claim by arbitration or at law. CONTRACTOR shall, to the fullest extent permitted by Laws and Regulations, indemnify and hold OWNER and ENGINEER harmless from and against all claims damages, losses and expenses (including, but not limited to fees or engineers, architects, attorneys and other professionals and court and arbitration costs) arising directly, indirectly or consequentially out of any action, legal or equitable, brought by any such other party against OWNER or ENGINEER to the extent based on a claim arising out of CONTRACTOR's performance of the Work.

6.17 During the progress of the Work, CONTRACTOR shall keep the premises free from accumulations of waste materials, rubbish and other debris resulting from the Work. At the completion of the Work CONTRACTOR shall remove all waste materials, rubbish and debris from and about the premises as well as all tools, appliances, construction equipment and machinery, and surplus materials, and shall leave the site clean and ready for occupancy by OWNER. CONTRACTOR shall restore to original condition all property not designated for alteration by the Contract Documents.

6.18 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 property to stresses or pressures that will endanger it.

Record Documents:

6.19 CONTRACTOR shall maintain in a safe place at the site one record copy of all Drawings, Specifications, Addenda, Written Amendments, Change Orders, Work Directive Changes, Field Orders and written interpretations and clarifications (issued pursuant to paragraph 9.4) in good order and annotated to show all changes made during construction. These record documents together with all approved samples and a counterpart of all approved Shop Drawings will be available to ENGINEER for reference. Upon completion of the Work, these record documents, samples and Shop Drawings will be delivered to ENGINEER for OWNER.

Safety and Protection:

6.20 CONTRACTOR shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. CONTRACTOR shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

6.20.1 all employees on the Work and other persons and organizations who may be affected thereby:

6.20.2 all the Work and materials and equipment to be incorporated therein, whether in storage on or off the site; and

6.20.3 other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities and Underground Facilities not designated for removal, relocation or replacement in the course of

construction.

CONTRACTOR shall comply with all applicable Laws and Regulations of any public body (Including OSHA) having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss; and shall erect and maintain all necessary safeguards for such safety and protection. CONTRACTOR shall notify owners of adjacent property and of Underground Facilities and utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation and replacement of their property. All damage, injury or loss to any property referred to in paragraph 6.20.2 or 6.20.3 caused, directly or indirectly, in whole or in part, by CONTRACTOR, any Subcontractor, Supplier or any other person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, shall be remedied by CONTRACTOR (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 either of them or anyone for whose acts either of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of CONTRACTOR). CONTRACTOR's duties and responsibilities for the safety and protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to OWNER and CONTRACTOR in accordance with paragraph 14.13 that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.21 CONTRACTOR shall designate a responsible representative at the site whose duty shall be the prevention of accidents. This person shall be CONTRACTOR's

superintendent unless otherwise designated in writing by CONTRACTOR to OWNER.

Emergencies:

6.22 In emergencies affecting the safety or protection of persons or the Work or property at the site or adjacent thereto, CONTRACTOR, without special instruction or authorization from ENGINEER or OWNER, is obligated to act to prevent threatened damage, injury or loss. CONTRACTOR shall give ENGINEER prompt written notice if CONTRACTOR believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby. If ENGINEER determines that a change in the Contract Documents is required because of the action taken in response to an emergency, a Work Directive Change or Change Order will be issued to document the consequences of the changes or variations.

Shop Drawings and Samples:

6.23 After checking and verifying all field measurements and after complying with applicable procedures specified in the General Requirements, CONTRACTOR shall submit to ENGINEER for review and approval in accordance with the accepted schedule of Shop Drawing submissions (see paragraph 2.9), or for other appropriate action if so indicated in the Supplementary Conditions, five copies (unless otherwise specified in the General Requirements) of all Shop Drawings, which will bear a stamp or specific written indication that CONTRACTOR has satisfied CONTRACTOR's responsibilities under the Contract Documents with respect to the review submission. All submissions will be

identified as ENGINEER may require. The data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials and similar data to enable ENGINEER to review the information as required.

6.24 CONTRACTOR shall also submit to ENGINEER for review and approval with such promptness as to cause no delay in Work, all samples required by the Contract Documents. All samples will have been checked by and accompanied by a specific written indication that CONTRACTOR has satisfied CONTRACTOR's responsibilities under the Contract Documents with respect to the review of the submission and will be identified clearly as to material, Supplier, pertinent data such as catalog numbers and the use for which intended.

6.25.1 Before submission of each Shop Drawing or sample CONTRACTOR shall have determined and verified all quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers and similar data with respect thereto and reviewed or coordinated each Shop Drawing or sample with other Shop Drawings and samples and with the requirements of the Work and the Contract Documents.

6.25.2 At the time of each submission, CONTRACTOR shall give ENGINEER specific written notice of each variation that the Shop Drawings or samples may have from the requirements of the Contract Documents, and, in addition, shall cause a specific notation to be made on each Shop Drawing submitted to ENGINEER for review and approval of each such variation.

6.26 ENGINEER will review and approve with reasonable promptness Shop Drawings

and samples, but ENGINEER's review and approval will be only for conformance with the design concept of the Project and for compliance with the information given in the Contract Documents and shall not extend to means, methods, techniques, sequences or procedures of construction (except where a specific means, method, technique, sequence or procedure of construction is indicated in or required by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions. 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.

6.27 ENGINEER's review and approval of Shop Drawings or samples shall not relieve CONTRACTOR from responsibility for any variation from the requirements of the Contract Documents unless CONTRACTOR has in writing called ENGINEER's attention to each such variation at the time of submission as required by paragraph 6.25.2 and ENGINEER has given written approval of each such variation by a specific written notation thereof incorporated in or accompanying the Shop Drawing or sample approval; nor will any approval by ENGINEER relieve CONTRACTOR from responsibility for errors or omissions in the Shop Drawings or from responsibility for having complied with the provisions of paragraph 6.25.1.

6.28 Where a Shop Drawing or sample is required by the Specifications, any related Work performed prior to ENGINEER's review and approval of the pertinent submission

will be the sole expense and responsibility of CONTRACTOR.

Continuing the Work:

6.29 CONTRACTOR shall carry on the Work and adhere to the progress schedule during all disputes or disagreements with OWNER. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by paragraph 15.5 or as CONTRACTOR and OWNER may otherwise agree in writing.

Indemnification:

6.30 To the fullest extent permitted by Laws and Regulations CONTRACTOR shall indemnify and hold harmless OWNER and ENGINEER and their consultants, agents and employees from and against all claims, damages, losses and expenses, direct, indirect or consequential (including but not limited to fees and charges of engineers, architects, attorneys and other professionals and court and arbitration costs) arising out of or resulting from the performance of the Work, provided that any such claim, damage, loss or expense (a) is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself) including the loss of use resulting there from and (b) is caused in whole or in part by a negligent act or omission of CONTRACTOR, any Subcontractor, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder or arises by or is imposed by Law and Regulations regardless of the negligence

of any such party.

6.31 In any and all claims against OWNER or ENGINEER or any of their consultants, agents or employees by any employee of CONTRACTOR, any Subcontractor, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, the indemnification obligation under paragraph 6.30 shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for CONTRACTOR or any such Subcontractor or other person or organization under workers' or workmen's compensation acts, disability benefit acts or other employee benefit acts.

6.32 The obligations of CONTRACTOR under paragraph 6.30 shall not extend to the liability of ENGINEER, ENGINEER's consultants, agents or employees arising out of the preparation or approval of maps, drawings, opinions, reports, surveys, Change Orders, designs or specifications.

ARTICLE 7 - OTHER WORK

Related Work at Site:

7.1 OWNER may perform other work related to the Project at the site by OWNER's own forces, have other work performed by utility owners or let other direct contracts therefore which shall contain General Conditions similar to these. If the fact that such other work is to be performed was not noted in the Contract Documents, written notice thereof will be given to CONTRACTOR prior to starting any such other work; and, if

CONTRACTOR believes that such performance will involve additional expense to CONTRACTOR or requires additional time and the parties are unable to agree as to the extent thereof, CONTRACTOR may make a claim therefore as provided in Articles 11 and 12.

7.2 CONTRACTOR shall afford each utility owner and other contractor who is a party to such a direct contract (or OWNER, if OWNER is performing the additional work with OWNER's employees) proper and safe access to the site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such work, and shall properly connect and coordinate the Work with theirs. CONTRACTOR shall do all cutting, fitting and patching of the Work that may be required to make its several parts come together properly and integrate with such other work. CONTRACTOR shall not endanger any work of others by cutting, excavating or otherwise altering their work and will only cut or alter their work with the written consent of ENGINEER and the others whose work will be affected. The duties and responsibilities of CONTRACTOR under this paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of CONTRACTOR in said direct contracts between OWNER and such utility owners and other contractors.

7.3 If any part of CONTRACTOR's Work depends for proper execution or results upon the work of any such other contractor or utility owner (or OWNER), CONTRACTOR shall inspect and promptly report to ENGINEER in writing any delays, defects or deficiencies in such work that render it unavailable or unsuitable for such proper execution and results. CONTRACTOR's failure so to report will constitute an

acceptance of the other work as fit and proper for integration with CONTRACTOR's Work except for latent or nonapparent defects and deficiencies in the other work.

Coordination:

7.4 If OWNER contracts with others for the performance of other work on the Project at the site, the person or organization who will have authority and responsibility for coordination of the activities among the various prime contractors will be identified in the Supplementary Conditions, and the specific matters to be covered by such authority and responsibility will be itemized, and the extent of such authority and responsibilities will be provided in the Supplementary Conditions. Unless otherwise provided in the Supplementary Conditions, neither OWNER nor ENGINEER shall have any authority or responsibility in respect of such coordination.

ARTICLE 8 - OWNER'S RESPONSIBILITIES

8.1 OWNER shall issue all communications to CONTRACTOR through ENGINEER.

8.2 In case of termination of the employment of ENGINEER, OWNER shall appoint an engineer against whom CONTRACTOR makes no reasonable objection, whose status under the Contract Documents shall be that of the former ENGINEER. Any dispute in connection with such appointment shall be subject to arbitration.

8.3 OWNER shall furnish the data required of OWNER under the Contract

Documents promptly and shall make payments to CONTRACTOR promptly after they are due as provided in paragraphs 14.4 and 14.13.

8.4 OWNER's duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in paragraphs 4.1 and 4.4. Paragraph 4.2 refers to OWNER's identifying and making available to CONTRACTOR copies of reports of explorations and tests of subsurface conditions at the site and in existing structures which have been utilized by ENGINEER in preparing the Drawings and Specifications.

8.5 OWNER's responsibilities in respect of purchasing and maintaining liability and property insurance are set forth in paragraphs 5.5 through 5.8.

8.6 OWNER is obligated to execute Change Orders as indicated in paragraph 10.4.

8.7 OWNER's responsibility in respect of certain inspections, tests and approvals is set forth in paragraph 13.4.

8.8 In connection with OWNER's right to stop Work or suspend Work, see paragraphs 13.10 and 15.1 Paragraph 15.2 deals with OWNER's right to terminate services of CONTRACTOR under certain circumstances.

ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION

Owner's Representative:

9.1 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 Documents and shall not be extended without written consent of OWNER and ENGINEER.

Visits to Site:

9.2 ENGINEER will make visits to the site at intervals appropriate to the various stages of construction to observe the progress and quality of the executed Work and to determine, in general, if the Work is proceeding in accordance with the Contract Documents. ENGINEER will not be required to make exhaustive or continuous on-site inspections 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 to the Contract Documents. On the basis of such visits and on-site observations as an experienced and qualified design professional, ENGINEER will keep OWNER informed of the progress of the Work and will endeavor to guard OWNER against defects and deficiencies in the Work.

Project Representation:

9.3 If OWNER and ENGINEER agree, ENGINEER will furnish a Resident Project Representative to assist ENGINEER in observing the performance of the Work. The duties, responsibilities and limitations of authority of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions. If OWNER designates another agent to represent OWNER at the site who is not

ENGINEER's agent or employee, the duties, responsibilities and limitations of authority of such other person will be as provided in the Supplementary Conditions.

Clarifications and Interpretation:

9.4 ENGINEER will issue with reasonable promptness such written clarifications or interpretations of the requirements of the Contract Documents (in the form of Drawings or otherwise) as ENGINEER may determine necessary, which shall be consistent with or reasonably inferable from the overall intent of the Contract Documents. If CONTRACTOR believes that a written clarification or interpretation justifies an increase in the Contract Price or an extension of the Contract Time and the parties are unable to agree to the amount or extent thereof, CONTRACTOR may make a claim therefore as provided in Article 11 or Article 12.

Authorized Variations in Work:

9.5 ENGINEER may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve as adjustment in the Contract Price or the Contract Time and are consistent with the overall intent of the Contract Documents. These may be accomplished by a Field Order and will be binding on OWNER, and also on CONTRACTOR who shall perform the Work involved promptly. If CONTRACTOR believes that a Field Order justifies an increase in the Contract Price or an extension of the Contract Time and the parties are unable to agree as to the amount or extent thereof, CONTRACTOR may make a claim therefore

as provided in Article 11 or 12.

Rejecting Defective Work:

9.6 ENGINEER will have authority to disapprove or reject Work which ENGINEER believes to be *defective*, and will also have authority to require special inspection or testing of the Work as provided in paragraph 13.9, whether or not the Work is fabricated, installed or completed.

Shop Drawings, Change Orders and Payments:

9.7 In connection with ENGINEER's responsibility for Shop Drawings and samples, see paragraphs 6.23 through 6.29 inclusive.

9.8 In connection with ENGINEER's responsibilities as to Change Orders, see Articles 10, 11, and 12.

9.9 In connection with ENGINEER's responsibilities in respect of Applications for Payment, etc., see Article 14.

Determinations for Unit Prices:

9.10 ENGINEER will determine the actual quantities and classifications of Unit Price Work performed by CONTRACTOR. ENGINEER will review with CONTRACTOR 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 decisions thereon will be final and binding upon OWNER and CONTRACTOR, unless, within ten days after the date of any such decision, either OWNER or CONTRACTOR delivers to the other party to

the Agreement and to ENGINEER written notice of intention to appeal from such a decision.

Decisions on Disputes:

9.11 ENGINEER will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. Claims, disputes and other matters relating to the acceptability of the Work or the interpretation of the requirements of the Contract Documents pertaining to the performance and furnishing of the Work and claims under Articles 11 and 12 in respect of changes in the Contract Price or Contract Time will be referred initially to ENGINEER in writing with a request for a formal decision in accordance with this paragraph, which ENGINEER will render in writing within a reasonable time. Written notice of each such claim, dispute and other matter will be delivered by the claimant to ENGINEER and the other party to the Agreement promptly (but in no event later than thirty days) after the occurrence of the event giving rise thereto, and written supporting data will be submitted to ENGINEER and the other party within sixty days after such occurrence unless ENGINEER allows an additional period of time to ascertain more accurate data in support of the claim.

9.12 When functioning as interpreter and judge under paragraphs 9.10 and 9.11, ENGINEER will not show partiality to OWNER or CONTRACTOR and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity. The rendering of a decision by ENGINEER pursuant to paragraphs 9.10 and 9.11 with respect to any such claim, dispute or other matter (except any which have been waived by the making or acceptance of

final payment as provided in paragraph 14.16) will be a condition precedent to any exercise by OWNER or CONTRACTOR of such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any such claim, dispute or other matter.

Limitations on ENGINEER's Responsibilities:

9.13 Neither ENGINEER's authority to act under this Article 9 or elsewhere in the Contract Documents nor any decision made by ENGINEER in good faith either to exercise or not exercise such authority shall give rise to any duty or responsibility of ENGINEER to CONTRACTOR, any Subcontractor, any Supplier, or any other person or organization performing any of the Work, or to any surety for any of them.

9.14 Whenever in the Contract Documents the terms "as ordered", "as directed", "as required", "as allowed", "as approved" or terms of like effect or import are used, or the adjectives "reasonable", "suitable", "acceptable", "proper" or "satisfactory" or adjectives of like effect or import are used to describe a requirement, direction, review or judgment of ENGINEER as to the Work, it is intended that such requirement, direction, review or judgment will be solely to evaluate the Work for compliance with the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective shall not be effective to assign to ENGINEER any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 9.15 or 9.16.

9.15 ENGINEER will not be responsible for CONTRACTOR's means, methods,

techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, and ENGINEER will not be responsible for CONTRACTOR's failure to perform or furnish the Work in accordance with the Contract Documents.

9.16 ENGINEER will not be responsible for the acts or omissions of CONTRACTOR or of any Subcontractor, any Supplier, or of any other person or organization performing or furnishing any of the Work.

ARTICLE 10 - CHANGES IN THE WORK

10.1 Without invalidating the Agreement and without notice to any surety, OWNER may, at any time or from time to time, order additions, deletions or revisions in the Work; these will be authorized by a Written Amendment, a Change Order, or a Work Directive Change. Upon receipt of any such document, CONTRACTOR shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

10.2 If OWNER and CONTRACTOR are unable to agree as to the extent, if any, of an increase or decrease in the Contract Price or an extension or shortening of the Contract Time that should be allowed as a result of a Work Directive Change, a claim may be made therefore as provided in Article 11 or Article 12.

10.3 CONTRACTOR shall not be entitled to an increase in the Contract Price or an extension of the Contract Time with respect

to any Work performed that is not required by the Contract Documents as amended, modified and supplemented as provided in paragraphs 3.4 and 3.5, except in the case of an emergency as provided in paragraph 6.22 and except in the case of uncovering Work as provided in paragraph 13.9.

10.4 OWNER and CONTRACTOR shall execute appropriate Change Orders (or Written Amendments)

10.4.1 changes in the Work which are ordered by OWNER pursuant to paragraph 10.1, are required because of acceptance of *defective* Work under paragraph 13.13 or correcting *defective* Work under paragraph 13.14, or are agreed to by the parties;

10.4.2 changes in the Contract Price or Contract Time which are agreed to by the parties; and

10.4.3 changes in the Contract Price or Contract Time which embody the substance of any written decision rendered by ENGINEER pursuant to paragraph 9.11;

provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, CONTRACTOR shall carry on the Work and adhere to the progress schedule as provided in paragraph 6.29.

10.5 If notice 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 Time) is required by the provisions of any Bond to be given to a surety, the giving of

any such notice will be CONTRACTOR's responsibility, and the amount of each applicable Bond will be adjusted accordingly.

ARTICLE 11 - CHANGE OF CONTRACT PRICE

11.1 The Contract Price constitutes the total compensation (subject to authorized adjustments) payable to CONTRACTOR for performing the Work. All duties, responsibilities and obligations assigned to or undertaken by CONTRACTOR shall be at his expense without change in the Contract Price.

11.2 The Contract Price may only be changed by a Change Order or by a Written Amendment. Any claim for an increase or decrease in the Contract Price shall be based on written notice delivered by the party making the claim to the other party and to ENGINEER promptly (but in no event later than thirty days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the amount of the claim with supporting data shall be delivered within sixty days after such occurrence (unless ENGINEER allows an additional period of time to ascertain more accurate data in support of the claim) and shall be accompanied by claimant's written statement that the amount claimed covers all known amounts (direct, indirect and consequential) to which the claimant is entitled as a result of the occurrence of said event. All claims for adjustment in the Contract Price shall be determined by ENGINEER in accordance with paragraph 9.11 if OWNER and CONTRACTOR cannot otherwise agree on the amount involved. No claim for an adjustment in the Contract Price will be valid if not submitted in accordance with this paragraph 11.2.

11.3 The value of any Work covered by a Change Order or of any claim for an increase or decrease in the Contract Price shall be determined in one of the following ways:

11.3.1 Where the Work involved is covered by unit prices contained in the Contract Documents, by application of unit prices to the quantities of the items involved (subject to the provisions of paragraphs 11.9.1. through 11.9.3, inclusive).

11.3.2 By mutual acceptance of a lump sum (which may include an allowance for overhead and profit not necessarily in accordance with paragraph 11.6.2.1.).

11.3.3 On the basis of the Cost of the Work (determined as provided in paragraphs 11.4 and 11.5) plus a CONTRACTOR's Fee for overhead and profit (determined as provided in paragraphs 11.6 and 11.7).

Cost of the Work:

11.4 The term Cost of the Work means the sum of all costs necessarily incurred and paid by CONTRACTOR in the proper performance of the Work. Except as otherwise may be agreed to in writing by OWNER, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items and shall not include any of the costs itemized in paragraph 11.5:

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

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

11.4.3 Payments made by CONTRACTOR to the Subcontractors for Work performed by

Subcontractors. If required by OWNER, CONTRACTOR shall obtain competitive bids from Subcontractors acceptable to CONTRACTOR and shall deliver such bids to OWNER who will then determine, with the advice of ENGINEER, which bids will be accepted. If a 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 shall be determined in the same manner as CONTRACTOR's Cost of the Work. All subcontracts shall be subject to the other provisions of the Contract Documents insofar as applicable.

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

11.4.5 Supplemental costs including the following:

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

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

by not consumed which remain the property of CONTRACTOR.

11.4.5.3 Rentals of all construction equipment and machinery and the parts thereof whether rented from CONTRACTOR or others in accordance with rental agreements approved by OWNER with the advice of ENGINEER, and the costs of transportation, loading, unloading, installation, dismantling and removal thereof - all in accordance with terms of said rental agreements. The rental of any such equipment, machinery or parts shall cease when the use thereof is no longer necessary for the Work.

11.4.5.4 Sales, consumer, use or similar taxes related to the Work, and for which CONTRACTOR is liable, imposed by Laws and Regulations.

11.4.5.5 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.

11.4.5.6 Losses and damages (and related expenses), not compensated by insurance or otherwise, to the Work or otherwise sustained by CONTRACTOR in connection with the performance and furnishing of the Work (except losses and damages within the deductible amounts of property insurance established by OWNER in accordance with paragraph 5.9), provided they have resulted from causes other than the negligence of

CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of OWNER. No such losses, damages and expenses will be included in the Cost of Work for the purpose of determining CONTRACTOR's Fee. If, however, any such loss or damage requires reconstruction and CONTRACTOR is placed in charge thereof, CONTRACTOR shall be paid for services a fee proportionate to that stated in paragraph 11.6.2.

11.4.5.7 The cost of utilities, fuel and sanitary facilities at the site.

11.4.5.8 Minor expenses such as telegrams, long distance telephone calls, telephone service at the site, expressage and similar petty cash items in connection with the Work.

11.4.5.9 Cost of premiums for additional Bonds and insurance required because of changes in the Work and premiums for property insurance coverage within the limits of the deductible amounts established by OWNER in accordance with paragraph 5.9.

11.5 The term Cost of the Work shall not include any of the following:

11.5.1 Payroll costs and other compensation of CONTRACTOR's officers, executives, principals (of partnership and sole proprietorships), general managers, engineers, architects, estimators,

attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks and other personnel employed by CONTRACTOR whether at the site or in CONTRACTOR's principal or a branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in paragraph 11.4.1 or specifically covered by paragraph 11.4.4 - all of which are to be considered administrative costs covered by the CONTRACTOR's Fee.

11.5.2 Expenses of CONTRACTOR's principal and branch offices other than CONTRACTOR's office at the site.

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

11.5.4 Cost of premiums for all Bonds and for all insurance whether or not CONTRACTOR is required by the Contract Documents to purchase and maintain the same (except for the cost of premiums covered by subparagraph 11.4.5.9 above).

11.5.5 Cost 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.

11.5.6 Other overhead or general expenses costs of any kind and the costs of any item not specifically and expressly included in paragraph 11.4.

CONTRACTOR's Fee:

11.6 The CONTRACTOR's Fee allowed to CONTRACTOR for overhead and profit shall be determined as follows:

11.6.1 a mutually acceptable fixed fee; or if none can be agreed upon,

11.6.2 a fee based on the following percentages of the various portions of the Cost of the Work:

11.6.2.1 for costs incurred under paragraphs 11.4.1 and 11.4.2, the CONTRACTOR's Fee shall be fifteen percent;

11.6.2.2 for costs incurred under paragraph 11.4.3, the CONTRACTOR's Fee shall be five percent; and if a subcontract is on the basis of Cost of the Work Plus a Fee, the maximum allowable to CONTRACTOR on account of overhead and profit of all Subcontractors shall be fifteen percent;

11.6.2.3 no fee shall be payable on the basis of costs itemized under paragraphs 11.4.4, 11.4.5 and 11.5;

11.6.2.4 the amount of credit to be allowed by CONTRACTOR to OWNER for any such change which results in a net decrease in cost will be the amount of the actual net decreases

plus a deduction in CONTRACTOR's Fee by an amount equal to ten percent of the net decrease; and

11.6.2.5 when both additions and credits are involved in any one change, the adjustment in CONTRACTOR's Fee shall be computed on the basis of the net change in accordance with paragraphs 11.6.2.1 through 11.6.2.4, inclusive.

11.7 Whenever the cost of any Work is to be determined pursuant to paragraph 11.4 or 11.5, CONTRACTOR will submit in form acceptable to ENGINEER an itemized cost breakdown together with supporting data.

Cash Allowances:

11.8 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 done by such Subcontractors or Suppliers and for such sums within the limit of the allowances as may be acceptable to ENGINEER. CONTRACTOR agrees that:

11.8.1. The 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

11.8.2. CONTRACTOR's costs for unloading and handling on the site, labor, installation costs, overhead, profit and other expenses contemplated for the allowances have been included in the Contract

Price and not in the allowances. No demand for additional payment on account of any thereof will be valid.

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

Unit Price Work:

11.9.1 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 established unit prices for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement. 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. Determinations of the actual quantities and classifications of Unit Price Work performed by CONTRACTOR will be made by ENGINEER in accordance with Paragraph 9.10.

11.9.2 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.

11.9.3 There the quantity of any item of Unit Price Work performed by CONTRACTOR differs materially and significantly from the estimated quantity of such item indicated in the Agreement and there is no corresponding adjustment with respect to any other item of Work and if CONTRACTOR

believes that CONTRACTOR has incurred additional expenses as a result thereof, CONTRACTOR may make a claim for an increase in the CONTRACTOR may make a claim for an increase in the Contract Price in accordance with Article 11 if the parties are unable to agree as to the amount of any such increase.

ARTICLE 12 - CHANGE OF CONTRACT TIME

12.1 The Contract Time may only be changed by a Change Order or a Written Amendment. Any claim for an extension or shortening of the Contract Time shall be based on written notice delivered by the party making the claim to the other party and to ENGINEER promptly (but in no event later than thirty days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the extent of the claim with supporting data shall be delivered within sixty days after such occurrence (unless ENGINEER allows an additional period of time to ascertain more accurate data in support of the claim) and shall be accompanied by the claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant has reason to believe it is entitled as a result of the occurrence of said event. All claims for adjustment in the Contract Time shall be determined by ENGINEER in accordance with paragraph 9.11 if OWNER and CONTRACTOR cannot otherwise agree. No claim for an adjustment in the Contract Time will be valid if not submitted in accordance with the requirements of this paragraph 12.1.

12.2 The Contract Time will be extended in an amount equal to time lost due to

delays beyond the control of CONTRACTOR if a claim is made therefore as provided in paragraph 12.1. Such delays shall include, but not be limited to, acts or neglect by OWNER or others performing additional work as contemplated by Article 7, or to fires, floods, labor disputes, epidemics, abnormal weather conditions or acts of God.

12.3 All time limits stated in the Contract Documents are of the essence of the Agreement. The provisions of this Article 12 shall not exclude recovery for damages (including but not limited to fees and charges of engineers, architects, attorneys and other professionals and court and arbitration costs) for delay by either party.

ARTICLE 13 - WARRANTY AND GUARANTEE; TESTS AND INSPECTIONS: CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

Warranty and Guarantee:

13.1 CONTRACTOR warrants and guarantees to OWNER and ENGINEER that all Work will be in accordance with the Contract Documents and will not be *defective*. Prompt notice of all defects shall be given to CONTRACTOR. All *defective* Work, whether or not in place, may be rejected, corrected or accepted as provided in this Article 13.

Access to Work:

13.2 ENGINEER and ENGINEER's representatives, other representative of OWNER, testing agencies and governmental agencies with jurisdictional interests will have access to the Work at reasonable times

for their observation, inspecting and testing. CONTRACTOR shall provide proper and safe conditions for such access.

Tests and Inspection:

13.3 CONTRACTOR shall give ENGINEER timely notice of readiness of the Work for all required inspection, tests or approvals.

13.4 If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) to specifically be inspected, tested or approved, CONTRACTOR shall assume full responsibility therefore, pay all costs in connection therewith and furnish ENGINEER the required certificates of inspection, testing or approval. CONTRACTOR shall also be responsible for and shall pay all costs in connection with any inspection or testing required in connection with OWNER's or ENGINEER's acceptance of a Supplier of materials or equipment proposed to be incorporated in the Work, or of materials or equipment submitted for approval prior to CONTRACTOR's purchase thereof for incorporation in the Work. The cost of all inspections, tests and approvals in addition to the above which are required by the Contract Documents shall be paid by OWNER (unless otherwise specified).

13.5 All inspections, tests or approvals other than those required by Laws or Regulations of any public body having jurisdiction shall be performed by organizations acceptable to OWNER and CONTRACTOR (or by ENGINEER if so specified).

13.6 If any Work (including the work of others) that is to be inspected, tested or approved is covered without written concurrence of ENGINEER, it must, if requested by ENGINEER, be uncovered for

observation. Such uncovering shall be at CONTRACTOR's expense unless CONTRACTOR has given ENGINEER timely notice of CONTRACTOR's intention to cover the same and ENGINEER has not acted with reasonable promptness in response to such notice.

13.7 Neither observations by ENGINEER nor inspections, tests or approvals by others shall relieve CONTRACTOR with CONTRACTOR's obligations to perform the Work in accordance with the Contract Documents.

Uncovering Work:

13.8 If any Work is covered contrary to the written request of ENGINEER, it must, if requested by ENGINEER, be uncovered for ENGINEER's observations and replaced at CONTRACTOR's expense.

13.9 If ENGINEER considers it necessary or advisable that covered Work be observed by ENGINEER or inspected or tested by others, 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, furnishing all necessary labor, material and equipment. If it is found that such Work is *defective*, CONTRACTOR shall bear all direct, indirect and consequential costs of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction, (including but not limited to fees and charges of engineers, architects, attorneys and other professionals), and OWNER shall be entitled to an appropriate decrease in the CONTRACT Price, and, if the parties are unable to agree as to the amount thereof, may make a claim therefore as provided in Article 11. If, however, such Work is not

found to be *defective*, CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction; and, if the parties are unable to agree as to the amount or extent thereof, CONTRACTOR may make a claim therefore as provided in Articles 11 and 12.

Owner May Stop the Work:

13.10 If the Work is *defective*, or CONTRACTOR fails to supply sufficient skilled workers or suitable materials or equipment, or fails to furnish or perform the Work in such a way that the completed Work will conform to the Contract Documents, OWNER may order CONTRACTOR to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of OWNER to stop the Work shall not give rise to any duty on the part of OWNER to exercise this right for the benefit of CONTRACTOR or any other party.

Correction or Removal of Defective Work:

13.11 If required by ENGINEER, CONTRACTOR shall promptly, as directed, either correct all *defective* Work, whether or not fabricated, installed or completed, or, if the Work has been rejected by ENGINEER, remove it from the site and replace it with *nondefective* Work. CONTRACTOR shall bear all direct, indirect and consequential costs of such correction or removal (including but not limited to fees and charges of engineers, architects, attorneys and other professionals) made necessary thereby.

One Year Correction Period:

13.12 If within one year after the date of Substantial Completion or such longer period of time as may be prescribed by Laws or Regulations or by the terms of any applicable special guarantee required by the Contract Documents or by any specific provision of the Contract Documents, any Work is found to be *defective*, CONTRACTOR shall promptly, without cost to OWNER and in accordance with OWNER's written instruction, either correct such *defective* Work, or, if it has been rejected by OWNER, remove it from the site and replace it with *nondefective* Work. If CONTRACTOR does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, OWNER may have the *defective* Work corrected or the rejected Work removed and replaced, and all direct, indirect and consequential costs of such removal and replacement (including but not limited to fees and charges of engineers, architects, attorneys and other professionals) will be paid by CONTRACTOR. 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 or by Written Amendment.

Acceptance of Defective Work:

13.13 If, instead of requiring correction or removal and replacement of *defective* Work, OWNER (and, prior to ENGINEER's recommendation of final payment, also ENGINEER) prefers to accept it, OWNER may do so. CONTRACTOR shall bear all direct, indirect and consequential costs attributable to OWNER's evaluation of and determination to accept such *defective* Work (such costs to be approved by ENGINEER as to

reasonableness and to include but not be limited to fees and charges of engineers, architects, attorneys and other professionals). If any such acceptance occurs prior to ENGINEER's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and OWNER shall be entitled to an appropriate decrease in the Contract Price, and, if the parties are unable to agree as to the amount thereof, OWNER may make a claim therefore as provided in Article 11. If the acceptance occurs after such recommendation, an appropriate amount will be paid by CONTRACTOR to OWNER.

OWNER May Correct Defective Work:

13.14 If CONTRACTOR fails within a reasonable time after written notice of ENGINEER to proceed to correct and to correct *defective* Work or to remove and replace rejected Work as required by ENGINEER in accordance with paragraph 13.11, or if CONTRACTOR fails to perform the Work in accordance with the Contract Documents, or if CONTRACTOR fails to comply with any other provision of the Contract Documents, OWNER may, after seven days' written notice to CONTRACTOR, correct and remedy any such deficiency. In exercising the rights and remedies under this paragraph OWNER shall proceed expeditiously. To the extent necessary to complete corrective and 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, take possession of CONTRACTOR's tools, appliances, construction equipment and machinery at the site 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 such access to the site as may be necessary to enable OWNER to exercise the rights and remedies under this paragraph. All direct, indirect and consequential costs of OWNER in exercising such rights and remedies will be charged against CONTRACTOR in an amount approved as to reasonableness by ENGINEER, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and OWNER shall be entitled to an appropriate decrease in the Contract Price, and, if the parties are unable to agree as to the amount thereof, OWNER may make a claim therefore as provided in Article 11. Such direct, indirect and consequential costs will include but not be limited to fees and charges of engineers, architects, attorneys and other professionals, all court and arbitration costs and all costs of repair and replacement of work of others destroyed or damaged by correction, removal or replacement of CONTRACTOR's *defective* Work. CONTRACTOR shall not be allowed an extension of the Contract Time because of any delay in performance of the Work attributable to the exercise by OWNER of OWNER's rights and remedies hereunder.

ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION

Schedule of Values:

14.1 The schedule of values established as provided in paragraph 2.8 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to ENGINEER. Progress payments on account of Unit Price Work will

be based on the number of units completed.

Application for Progress Payment:

14.2 At least twenty days before each progress payment is scheduled (but not more often than once a month), CONTRACTOR shall submit to ENGINEER for review an Application for Payment filled out and signed by CONTRACTOR covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice or other documentation warranting that OWNER has received the materials and equipment free and clear of all liens, charges, security interests and encumbrances (which are hereinafter in these General Conditions referred to as "Liens") and evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect OWNER's interest therein, all of which will be satisfactory to OWNER. The amount of retainage with respect to progress payments will be as stipulated in the Supplementary Conditions.

CONTRACTOR's Warranty of Title:

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

Review of Applications for Progress Payment:

14.4 ENGINEER will, within ten days after receipt of each Application for Payment, 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. Thirty days after presentation of the Application for Payment with ENGINEER's recommendation, the amount recommended will (subject to the provisions of the last sentence of paragraph 14.7) become due and when due will be paid by OWNER to CONTRACTOR.

14.5 ENGINEER's recommendation of any payment requested in an Application for Payment will constitute a representation by ENGINEER to OWNER, based on ENGINEER's on-site observations of the Work in progress as an experienced and qualified design professional and on ENGINEER's review of the Application for Payment and the accompanying data and schedules that the Work has progressed to the point indicated; that, to the best of ENGINEER's knowledge, information and belief, the quality of the Work is in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for Unit Price Work under paragraph 9.10, and to any other qualifications stated in the recommendation); and that CONTRACTOR is

entitled to payment of the amount recommended. However, by recommending any such payment ENGINEER will not thereby be deemed to have represented that exhaustive or continuous on-site inspections have been made to check the quality or the quantity of the Work beyond the responsibilities specifically assigned to ENGINEER in the Contract Documents or that there may not be other matters or issues between the parties that might entitle CONTRACTOR to be paid additionally by OWNER or OWNER to withhold payment to CONTRACTOR.

14.6 ENGINEER's recommendation of final payment will constitute an additional representation by ENGINEER to OWNER that the conditions precedent to CONTRACTOR's being entitled to final payment as set forth in paragraph 14.13 have been fulfilled.

14.7 ENGINEER may refuse to recommend the whole or any part of any payment if, in ENGINEER's opinion, it would be incorrect to make such representations to OWNER. ENGINEER may also refuse to recommend any such payment, or, because of subsequently discovered evidence or the results of subsequent inspections or tests, nullify any such payment previously recommended, to such extents as may be necessary in ENGINEER's opinion to protect OWNER from loss because:

14.7.1 the Work is *defective*, or completed Work has been damaged requiring correction or replacement.

14.7.2 the Contract Price has been reduced by Written Amendment or Change Order,

14.7.3 OWNER has been required to correct *defective* Work or complete Work in accordance with paragraph 13.14, or

14.7.4 of ENGINEER's actual knowledge of the occurrence of any of the events enumerated in paragraphs 15.2.1 through 15.2.9 inclusive.

OWNER may refuse to make payment of the full amount recommended by ENGINEER because claims have been made against OWNER on account of CONTRACTOR's performance or furnishing of the Work or Liens have been filed in connection with the Work or there are other items entitling OWNER to a set-off against the amount recommended, but OWNER must give CONTRACTOR immediate written notice (with a copy to ENGINEER) stating the reasons for such action.

Substantial Completion:

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

tentative certificate during which to make written objection to ENGINEER as to any provisions of the certificate or attached list. If, after considering such objections, ENGINEER concludes that the Work is not substantially complete, ENGINEER will within fourteen days after submission of the tentative certificate to OWNER notify CONTRACTOR in writing, stating the reasons therefore. If, after consideration of OWNER's objections, ENGINEER considers the Work substantially complete, ENGINEER will within said fourteen days execute and deliver to OWNER and CONTRACTOR a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as ENGINEER believes justified after consideration of any objections from OWNER. At the time of delivery of the tentative certificate of Substantial Completion ENGINEER will deliver to OWNER and CONTRACTOR a written recommendation as to division of responsibilities pending final payment between OWNER and CONTRACTOR with respect to security, operation, safety, maintenance, heat, utilities, insurance and warranties. Unless OWNER and CONTRACTOR agree otherwise in writing and so inform ENGINEER prior to ENGINEER's issuing the definitive certificate of Substantial Completion, ENGINEER's aforesaid recommendation will be binding on OWNER and CONTRACTOR until final payment.

14.9 OWNER shall have the right to exclude CONTRACTOR from the Work after the date of Substantial Completion, but OWNER shall allow CONTRACTOR reasonable access to complete or correct items on the tentative list.

Partial Utilization:

14.10 Use by OWNER of any finished 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 useable part of the Work that can be used by OWNER without significant interference with CONTRACTOR's performance of the remainder of the Work, may be accomplished prior to Substantial Completion of all the Work subject to the following:

14.10.1 OWNER at any time may request CONTRACTOR in writing to permit OWNER to use any such part of the Work which OWNER believes to be ready for its intended use and substantial complete. If CONTRACTOR agrees, CONTRACTOR will certify to OWNER and ENGINEER that said part of the Work is substantially complete and request ENGINEER to issue a certificate of Substantial Completion for that part of the Work. CONTRACTOR at any time may notify OWNER and ENGINEER in writing that CONTRACTOR considers any such part of the Work ready for its intended use and substantially complete and request ENGINEER to issue a certificate of Substantial Completion for that part of the Work. Within a reasonable time after either such request, OWNER, CONTRACTOR and ENGINEER shall make an inspection of that part of the Work to determine its status of completion. If ENGINEER does not consider that part of the Work to be substantially complete, ENGINEER will notify OWNER and CONTRACTOR in writing giving the reasons therefore. If ENGINEER

considers that part of the Work to be substantially complete, the provisions of paragraphs 14.8 and 14.9 will apply with respect to certification of Substantial Completion of that part of the Work and the division or responsibility in respect thereof and access thereto.

14.10.2 OWNER may at any time request CONTRACTOR in writing to permit OWNER to take over operation of any such part of the Work although it is not substantially complete. A copy of such request will be sent to ENGINEER and within a reasonable time thereafter OWNER, CONTRACTOR and ENGINEER shall make an inspection of that part of the Work to determine its status of completion and will prepare a list of the items remaining to be completed or corrected thereon before final payment. If CONTRACTOR does not object in writing to OWNER and ENGINEER that such part of the Work is not ready for separate operation by OWNER, ENGINEER will finalize the list of items to be completed or corrected and will deliver such list to OWNER and CONTRACTOR together with a written recommendation as to the division of responsibilities pending final payment between OWNER and CONTRACTOR with respect to security, operation, safety, maintenance, utilities, insurance warranties and guarantees for that part of the Work which will become binding upon OWNER and CONTRACTOR at the time when OWNER takes over such operation (unless they shall have otherwise agreed in writing and so informed ENGINEER). During such operation

and prior to Substantial Completion of such part of the Work, OWNER shall allow CONTRACTOR reasonable access to complete or correct items on said list and to complete other related Work.

14.10.3 No occupancy or separate operation of part of the Work will be accomplished prior to compliance with the requirements of paragraph 5.15 in respect of property insurance.

Final Inspection:

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

Final Application for Payment:

14.12 After CONTRACTOR has completed all such corrections to the satisfaction of ENGINEER and delivered all maintenance and operating instruction, schedules, guarantees, Bonds, certificates of inspection, marked-up record documents (as provided in paragraph 6.19) and other documents - all as required by the Contract Documents, and after ENGINEER has indicated that the Work is acceptable (subject to the provisions of paragraph 14.16), CONTRACTOR may make application for final payment following the procedure for progress payments. The final Application for Payment shall be accompanied by all documentation called for

in the Contract Documents, together with complete and legally effective releases of waivers (satisfactory to OWNER) of all Liens arising out of or filed in connection with the Work. In lieu thereof and as approved by OWNER, CONTRACTOR may furnish receipts or leases in full; an affidavit of CONTRACTOR that the releases and receipts include all labor, services, material and equipment for which a Lien could be filed, and that all payrolls, material and equipment bills, and other indebtedness connected with the Work for which OWNER or OWNER's property might in any way be responsible, have been paid or otherwise satisfied; and consent of the surety, if any, to final payment. If any Subcontractor or Supplier fails to furnish a release or receipt in full, CONTRACTOR may furnish a Bond or other collateral satisfactory to OWNER to indemnify OWNER against any Lien.

Final Payment and Acceptance:

14.13 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 - all as required by the Contract Documents, ENGINEER is satisfied that the Work has been completed and CONTRACTOR's other obligations under the Contract Documents have been fulfilled, ENGINEER will, within ten days after receipt of the final Application for Payment, indicate in writing ENGINEER's recommendation of payment and present the Application to OWNER for payment. Thereupon ENGINEER will give written notice to OWNER and CONTRACTOR that the Work is acceptable subject to the provisions of paragraph 14.16. Otherwise, ENGINEER will return the Application 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. Thirty days after presentation to OWNER of the Application and accompanying documentation, in appropriate form and substance, and with ENGINEER's recommendation and notice of acceptability, the amount recommended by ENGINEER will become due and will be paid by OWNER to CONTRACTOR.

14.14 If, through no fault of CONTRACTOR, final completion of the Work is significantly delayed and if ENGINEER so confirms, OWNER shall, upon receipt of CONTRACTOR's final Application for Payment and recommendation of ENGINEER, and without terminating the Agreement, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by OWNER for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if Bonds have been furnished as required in paragraph 5.1, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by CONTRACTOR to ENGINEER with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

Contractor's Continuing Obligation:

14.15 CONTRACTOR's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. Neither recommendation of any progress or final payment by ENGINEER, nor the issuance of a certificate of Substantial Completion, nor any payment by OWNER to CONTRACTOR under the Contract Docu-

ments, nor any use or occupancy of the Work or any part thereof by OWNER, nor any act of acceptance by OWNER nor any failure to do so, nor any review and approval of a Shop Drawing or sample submission, nor the issuance of a notice of acceptability by ENGINEER pursuant to paragraph 14.13, nor any correction of *defective* Work by OWNER will constitute an acceptance of Work not in accordance with the Contract Documents or a release of CONTRACTOR's obligation to perform the Work in accordance with the Contract Documents (except as provided in paragraph 14.16).

Waiver of Claims:

14.16 The making and acceptance of final payment will constitute:

14.16.1 a waiver of all claims by OWNER against CONTRACTOR, except claims arising from unsettled Liens, from *defective* Work appearing after final inspection pursuant to paragraph 14.11 or from failure to comply with the Contract Documents or the terms of any special guarantees specified therein; however, it will not constitute a waiver by OWNER of any rights in respect of CONTRACTOR's continuing obligations under the Contract Documents; and

14.16.2 a waiver of all claims by CONTRACTOR against OWNER other than those previously made in writing and still unsettled.

ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

Owner May Suspend Work:

15.1 OWNER may, at any time and without cause, suspend the Work or any portion thereof for a period of not more than ninety days by notice in writing to CONTRACTOR and ENGINEER which will fix the date on which Work will be resumed. CONTRACTOR shall resume the Work on the date so fixed. CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to any suspension if CONTRACTOR makes an approved claim therefore as provided in Articles 11 and 12.

Owner May Terminate:

15.2 Upon the occurrence of any one or more of the following events:

15.2.1 if CONTRACTOR commences a voluntary case under any chapter of the Bankruptcy Code (Title 11, United States Code), as now or hereafter in effect, or if CONTRACTOR takes any equivalent or similar action by filing a petition or otherwise under any other federal or state law in effect at such time relating to the bankruptcy or insolvency;

15.2.2 if a petition is filed against CONTRACTOR under any chapter of the Bankruptcy Code as now or hereafter in effect at the time of filing, or if a petition is filed seeking any such equivalent or similar relief against CONTRACTOR under any other federal or state law in effect at the time relating to bankruptcy or insolvency;

15.2.3 if CONTRACTOR makes a general assignment for the benefit or creditors;

15.2.4 if a trustee, receiver, custodian or agent of CONTRACTOR is appointed under applicable law or under contract, whose appointment or authority to take charge or property of CONTRACTOR is for the purpose of enforcing a Lien against such property or for the purpose of general administration of such property for the benefit of CONTRACTOR's creditors:

15.2.5 if CONTRACTOR admits in writing an inability to pay its debts generally as they become due;

15.2.6 if CONTRACTOR persistently fails 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 established under paragraph 2.9 as revised from time to time);

15.2.7 if CONTRACTOR disregards Laws or Regulations of any public body having jurisdiction;

15.2.8 if CONTRACTOR disregards the authority of ENGINEER; or

15.2.9 if CONTRACTOR otherwise violates in any substantial way any provisions of the Contract Documents;

OWNER may, after giving CONTRACTOR (and

the surety, if there be one) seven days' written notice and to the extent permitted by Laws and Regulations, terminate the services of CONTRACTOR, exclude CONTRACTOR from the site and take possession of the Work and of all CONTRACTOR's tools, appliances, construction equipment and machinery at the site and use the same to the full extent they could be used by CONTRACTOR (without liability to CONTRACTOR for trespass or conversion), 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 finish the Work as OWNER may deem expedient. In such case CONTRACTOR shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds the direct, indirect and consequential costs of completing the Work (including but not limited to fees and charges of engineers, architects, attorneys and other professionals and court and arbitration costs) such excess will be paid to CONTRACTOR. If such costs exceed such unpaid balance, CONTRACTOR shall pay the difference to OWNER. Such costs incurred by OWNER will be approved as to reasonableness by ENGINEER and incorporated in a Change Order, but when exercising any rights or remedies under this paragraph OWNER shall not be required to obtain the lowest price for the Work performed.

15.3 Where CONTRACTOR's services have been so terminated by OWNER, the termination will not affect any rights or remedies of OWNER against CONTRACTOR when existing or which may thereafter accrue. Any retention or payment of moneys due CONTRACTOR by OWNER will not release CONTRACTOR from liability.

15.4 Upon seven days' written notice to CONTRACTOR and ENGINEER, OWNER may, without cause and without prejudice to any other right or remedy, elect to abandon the Work and terminate the Agreement. In such case, CONTRACTOR shall be paid for all Work executed and any expense sustained plus reasonable termination expenses, which will include, but not be limited to, direct, indirect and consequential costs (including, but not limited to, fees and charges of engineers, architects, attorneys and other professionals and court and arbitration costs).

Contractor May Stop Work or Terminate:

15.5 If, through no act or fault of CONTRACTOR, the Work is suspended for a period of more than ninety days by OWNER or under an order of court or other public authority, or ENGINEER fails to act on any Application for Payment within thirty days after it is submitted, or OWNER fails for thirty days to pay CONTRACTOR any sum finally determined to be due, then CONTRACTOR may, upon seven days' written notice to OWNER and ENGINEER, terminate the Agreement and recover from OWNER payment for all Work executed and any expense sustained plus reasonable termination expenses. In addition and in lieu of terminating the Agreement, if ENGINEER has failed to act on an Application for Payment or OWNER has failed to make any payment as aforesaid, CONTRACTOR may upon seven days' written notice to OWNER and ENGINEER stop the Work until payment of all amounts then due. The provisions of this under paragraph 6.29 to carry on the Work in accordance with the progress schedule and without delay during disputes and disagreements with OWNER.

ARTICLE 16 - DISPUTE RESOLUTION

16.1 METHODS AND PROCEDURES

In an effort to resolve any conflicts that arise during the construction of the project or following the completion of the project, the OWNER and the CONTRACTOR agree that all disputes between them arising out of or relating to this Agreement shall be submitted to nonbinding mediation, unless the parties mutually agree otherwise.

The OWNER and the CONTRACTOR further agree to include a similar mediation provision in all agreements with independent contractors and consultants retained for the project and to require all independent contractors and consultants also to include a similar mediation provision in all agreements with subcontractors, subconsultants, suppliers or fabricators so retained, thereby providing for mediation as the primary method for dispute resolution between the parties to those agreements.

ARTICLE 17 - MISCELLANEOUS

Giving Notice:

17.1 Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered at or sent by registered or certified mail, postage prepaid,

to the last business address known to the giver of the notice.

Computation of Time:

17.2.1 When any period of time is referred to in the Contract Documents 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.

17.2.2 A calendar day of twenty-four hours measured from midnight to the next midnight shall constitute a day.

General:

17.3 Should OWNER or CONTRACTOR suffer injury or damage to person or property because of any error, omission or act of the other party or of any of the other party's employees or agents or others for whose acts the other party is legally liable, claim will be made in writing to the other party within a reasonable time of the first observance of such injury or damage. The provisions of this paragraph 17.3 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitations or repose.

17.4 The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto, and, in particular but without limitation, the warranties, guarantees and obligations imposed upon CONTRACTOR by paragraphs 6.30, 13.1, 13.12, 13.14, 14.3 and 15.2 and all of the rights and remedies available to OWNER and ENGINEER thereunder, 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 Documents, and 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. All representations, warranties and guarantees made in the Contract Documents will survive final payment and termination or completion of the Agreement.

**SECTION 00800
SUPPLEMENTARY CONDITIONS**

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract and other provisions of the Contract Documents as indicated below. All provisions that are not so amended or supplemented remain in full force and effect.

The terms used in these Supplementary Conditions will have the meanings indicated 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.

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SC-2.3. Delete Paragraph 2.3 in its entirety and insert the following in its place:

The Contract Time will commence to run 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 Agreement.

SC-2.4. Delete Paragraph 2.4 in its entirety and insert the following in its place:

The Contractor shall start to perform the Work within 10 calendar days of the date when the Contract Time commences to run, but no Work shall be done at the site prior to the date on which the Contract Time commences to run.

SC-2.5. Add the following to the end of Paragraph 2.5:

Any known discrepancy that Contractor adjusts without requesting interpretation or clarification from the Engineer shall be made at the risk of the Contractor, and Contractor shall bear all expenses arising from complications from such adjustment.

SC-2.7. Add the following to the end of Paragraph 2.7:

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

SC-4.2.1 Add the following to the end of Paragraph 4.2.1

In the preparation of Drawings and Specifications, Engineer has relied upon the following reports of explorations and test of sub-surface conditions at the site of the Work:

4.2.1.1 None

SC-4.3.3 Add a new Paragraph immediately after Paragraph 4.3.2:

4.3.3 In the preparation of Drawings and Specifications, Engineer has relied upon the following drawings of physical conditions in or relating to existing surface and sub-surface structures (except Underground Utilities) which are contiguous to the site of the Work:

4.3.3.1 Western Interceptor Sewer Phase 2 – Pump Stations By: Hofstadter & Associates, Inc. Record Drawings Dated 1994

SC-5.4. Delete Paragraph 5.4 and the heading entitled "Contractual Liability Insurance:" in its entirety and insert the following in its place:

5.4 The limits of liability for insurance required by Paragraph 5.3 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:

5.4.1. Workers' Compensation, and related coverages under Paragraphs 5.3.1 and 5.3.2 of the General Conditions:

- 5.4.1.1. State: Statutory
- 5.4.1.2. Applicable Federal (e.g., Longshoremen's) Statutory
- 5.4.1.3. Employer's Liability \$ 200,000
- 5.4.1.4. Contractor shall show Owner as additional insured.
- 5.4.2. Contractor's Comprehensive General Liability under Paragraphs 5.3.3 through 5.3.6 of the General Conditions:
 - 5.4.2.1 Combined Single Limit for Bodily Injury and Property Damage

\$1,000,000	Each Occurrence
Or combined single limit	\$2,000,000
General Aggregate	\$2,000,000
Operations Aggregate	\$2,000,000
 - 5.4.2.2. Property Damage liability insurance will provide Explosion, Collapse and Underground coverages where applicable.
 - 5.4.2.3. Personal Injury, with employment exclusion deleted

\$1,000,000	Annual Aggregate
\$1,000,000	Each Occurrence
- 5.4.3. Comprehensive Automobile Liability under Paragraph 5.3.7 of the General Conditions:
 - 5.4.3.1. Bodily Injury:

\$1,000,000	Each Person
\$2,000,000	Each Occurrence
 - 5.4.3.2 Property Damage:

\$1,000,000	Each Occurrence
Or combined single limit	\$2,000,000
- 5.4.4 Builders Risk Insurance (Fire and Extended Coverage):
 - 5.4.4.1 100% completed value based on the insurable portion of the project

5.4.4.2 Policy must protect the interests of the Owner, Contractor, and Sub-Contractors against loss by fire, vandalism, malicious mischief, and all hazards included in a standard "All Risk" Coverage endorsement. Policies shall be in the name of the Owner and Contractor.

5.4.5 The comprehensive general liability insurance will include contractual liability insurance applicable to CONTRACTOR's obligations under paragraphs 6.30 and 6.31 of the General Conditions. Contractual Liability coverage shall provide coverage for not less than the following amounts:

5.4.5.1. Bodily Injury:

\$500,000	Each Occurrence
-----------	-----------------

5.4.5.2 Property Damage:

\$100,000	Each Occurrence
\$ N/A	Annual Aggregate

SC-6.4 Add the following language at the end of paragraph 6.4:

Contractor shall arrange for all necessary services through the local agencies at his own expense.

SC-6.7.3. Delete Paragraph 6.7.3 in its entirety and insert the following in its place:

6.7.3 ENGINEER will be allowed a reasonable time within which to evaluate each proposed substitute/ "or-equal" item. Complete written applications as detailed in Section 6.7 of the General Conditions must be received by ENGINEER at least fifteen (15) calendar days prior to the date (by end-of-business) for receipt of Bids. The burden of proof of the merit of the substitute/ "or-equal" item is upon the Bidder. ENGINEER will be the sole judge of acceptability, and ENGINEER'S decision of approval or disapproval of an item will be final. If ENGINEER approves any substitute/ "or-equal" item, such approval will be set forth in an Addendum issued to prospective Bidders. Bidders shall not rely upon approvals made in any other manner.

SC-6.7.4-6 Add new paragraphs immediately after Paragraph 6.7.3:

6.7.4 Submittals for substitute/ "or-equal" items shall include illustrative drawings, specifications, descriptive brochures, installation lists, weights, metal thickness of principal components, drive arrangements, torques, power requirements, performance curves, installation requirements, availability of spare parts, local

service capability, and other items necessary for the ENGINEER to determine that the intent of the Specifications is to be met. Submittal must also include an enumeration of any and all changes required in the contract documents for incorporation of the proposed item. Incomplete submittals will not be reviewed or commented upon.

6.7.5 Submitted items that are determined to be “equal” or acceptable substitute to the named equipment or item in the specifications will be approved and commented upon by addendum to notify all Bidders of approval and any stipulations for the products use in preparation of his/her bid.

SC-6.8.3 Add a new paragraph immediately after Paragraph 6.8.2:

6.8.3. The Contractor shall not award work valued at more than fifty (50%) percent of the Contract Price to Subcontractor(s), without prior written approval of the Owner.

SC-6.21 Add the following language at the end of paragraph 6.21:

The Contractor shall provide, at the site, such equipment and medical facilities as are necessary to supply first-aid service to anyone who may be injured in connection with the work. The Contractor must report in writing to the Engineer all accidents whatsoever arising out of, or in connection with, the performance of the work, whether on or adjacent to the site, which causes death, personal injury or property damages, giving full details and statement of witnesses. In addition, if death or serious injuries or serious damages are caused, the accident shall be reported immediately by telephone or messenger to the Contractor and any subcontractor so that Contractor may promptly report the facts to the Engineer, giving full details of the accident. The Contractor shall advise his superintendent and foreman, who are on the site of the work, the name of the hospital and phone number and the name and phone number of the doctor he proposes to use in case of an accident.

SC-6.33 Add a new paragraph immediately after Paragraph 6.32:

6.33 Contractor shall require any and all subcontractors to conform to the obligations under paragraph 6.30 prior to commencing any work.

SC-9.3 Add the following language at the end of paragraph 9.3:

The Owner reserves the right to provide Resident Project Representative services for this project through the services of the Engineer. The Duties, Responsibilities, and Limitations of Authority of the Resident Project Representative will be as stated in the Agreement Between Owner and Engineer, executed for this specific Project.

SC-11.9.2 Add the following language at the end of paragraph 11.9.2:

Direct payment will only be made items specifically listed in the Bid Form, and the cost of any other work will be included in the unit price for the item to which it relates.

SC-12.2 Add the following sub-Paragraphs to Paragraph 12.2

12.2.1 For the purposes of this contract, abnormal weather conditions shall be defined as wet weather conditions that exceed the normal, reasonably expected adverse weather days for that particular place at that particular time of year. Extension of time for abnormal weather conditions will be granted for those days where precipitation is one-eighth (0.125) inches or greater and where the number of such days exceed the normal, reasonably expected adverse weather days in that particular month. No reduction in Contract Time will be required for calendar months with less than the normal adverse weather days.

12.2.2 The determination of normal adverse weather days will be based on the average number of calendar days over the last five years in which more than one-eighth (0.125) inches of rain fell as measured by the Vidalia, Georgia "Stanley Farms" station for that particular month. This data may be accessed via the following website:

<http://www.georgiaweather.net/>

12.2.3 For this purposes of this contract, normal adverse weather days, as calculated by the method described in 12.2.2 are listed below by month:

January	6	July	8
February	5	August	9
March	6	September	5
April	5	October	3
May	5	November	5
June	7	December	5

12.2.4 Requests for extension of Contract Time due to abnormal weather conditions must be submitted to Engineer with the monthly pay request for the month in which the delays occurred. Failure to request such extension with the pay request may invalidate the Contractor's right to an extension for these delays.

SC-12.3.1 Add the following sub-Paragraph to Paragraph 12.3:

- 12.3.1 If the Contractor fails to prosecute the work with such diligence as will insure the completion of each portion of the work within the Contract Time, plus any extensions made in accordance with Article 12 of the General Conditions, and if the Owner does not exercise his reservations as set forth in Article 13 of the General Conditions, the Contractor shall continue the work, in which event, actual damages for the delay will be impossible to determine. In lieu thereof, liquidated damages in the amount of \$500 per calendar day for each day that the work is delayed beyond the contract completion will be assessed to the Contractor until the work is completed.

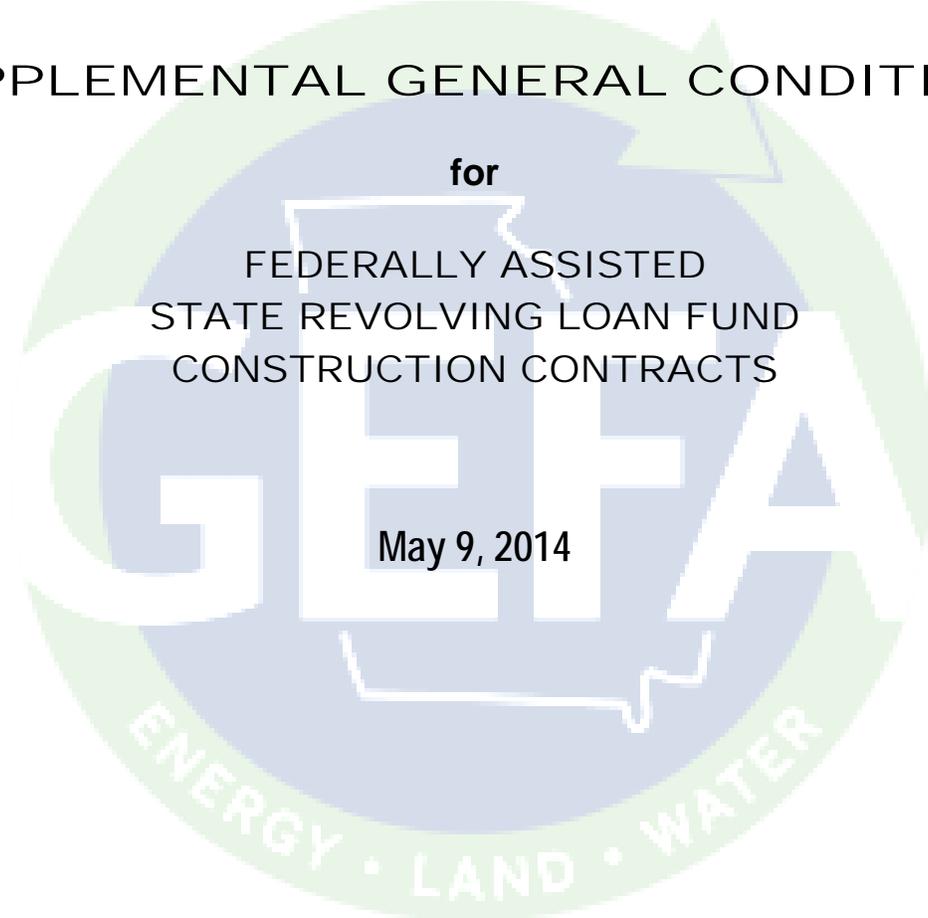
SC-13.2 Delete Paragraph 13.2 in its entirety and insert the following in its place:

Engineer and Engineer's representatives, other representative of Owner, testing agencies, the Georgia Department of Natural Resources, the Environmental Protection Division, the Department of Labor, and any other governmental agencies with jurisdictional interests will have access to the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide proper and safe conditions for such access.

SC-17.5 Add the following new Paragraphs immediately after Paragraph 17.4:

- 17.5 The Contractor acknowledges the requirement of the High Voltage Act of the General Assembly of Georgia by execution of the Agreement.
- 17.6 The Contractor shall comply with the Department of Labor Safety and Health Regulation for Construction promulgated under the Occupational Safety and Health Act of 1970 (PL 91-596) and under Section 107 of the Contract Work and Safety Standards Act (PL 91-54). These regulations are administered by the Department of Labor and the Contractor shall allow access to the project to personnel from that Department.
- 17.7 The Contractor shall occupy the status of an Independent Contractor and the Contractor's employees are not employees of the Owner.

GEORGIA ENVIRONMENTAL FINANCE AUTHORITY
SUPPLEMENTAL GENERAL CONDITIONS



The following standard language must be incorporated into construction contract documents and in all solicitations for offers and bids for all construction contracts or subcontracts in excess of \$10,000 to be funded in whole or in part by the Federally-assisted State Revolving Fund in the State of Georgia.

These Supplemental General Conditions shall not relieve the participants in this project of responsibility to meet any requirements of other portions of this construction contract or of other agencies, whether these other requirements are more or less stringent. The requirements in these Supplemental General Conditions must be satisfied in order for work to be funded with the State Revolving Fund.

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INSTRUCTIONS & GENERAL REQUIREMENTS

It is the policy of the State Revolving Loan Fund (SRF) to promote a fair share of subcontract, materials, equipment and service awards to small, minority, and 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. Failure on the part of the apparent successful bidder to submit required information to the loan recipient (Owner) may be considered by the Owner in evaluating whether the bidder is responsive to bid requirements.

THE PRIME CONTRACTOR MUST SUBMIT THE FOLLOWING ITEMS TO THE OWNER:

A. Before beginning the work of any contract:

- 1) **DBE Compliance Form and related documentation.** The Owner must submit this information to the Georgia Environmental Finance Authority (GEFA) to demonstrate compliance with Disadvantaged Business Enterprise (DBE) requirements. GEFA concurrence is recommended prior to award of the construction contract and is required prior to commencement of any SRF-funded construction. (Pages GEFA-4&5)
- 2) **Certification Regarding Equal Employment Opportunity.** This form is required for the Prime Contractor and for all subcontractors. The Prime Contractor form should be submitted with the DBE Compliance Form, and the subcontractor forms should be submitted as the subcontracts are executed. (Page GEFA-9)
- 3) **Certification Regarding Debarment, Suspension, & Other Responsible Matters.** This form is required for the Prime Contractor and for all subcontractors. The Prime Contractor form should be submitted with the DBE Compliance Form and the subcontractor forms should be submitted as the subcontracts are executed. (Page GEFA-10)
- 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 Prime Contractor, how much the DBE subcontractor was paid, and any concerns the DBE subcontractor might have. The Prime Contractor must provide this form to each DBE subcontractor. The DBE subcontractor can, as an option, complete and submit this form to the GEFA DBE Coordinator, who will also forward the form to the EPA DBE Coordinator. (Page GEFA-11)
- 5) ***EPA Form 6100-3 DBE Subcontractor Performance Form.** This form captures the description of work to be performed by an intended DBE subcontractor and the price of the work. This form is to be provided by the Prime Contractor to each DBE subcontractor and submitted with the DBE Compliance Form. (Page GEFA-12)
- 6) ***EPA Form 6100-4 DBE Subcontractor Utilization Form.** This form captures intended or anticipated use of an identified DBE subcontractor by the Prime Contractor and the estimated dollar amount of the work. This form is to be completed by the Prime Contractor and submitted with the DBE Compliance Form. (Page GEFA-13)

* 6100 FORMS ARE NOT REQUIRED WHEN ALL OF THE WORK IS SELF-PERFORMED BY THE PRIME CONTRACTOR.

B. During the performance of the contract:

- 7) **Changes to Subcontractors Form.** If any changes, substitutions, or additions are proposed to the subcontractors included in previous GEFA concurrences, the Owner must submit this information to GEFA for prior concurrence in order for the affected subcontract work to be eligible for SRF funding. (Page GEFA-14)
- 8) **DBE Annual Report.** The Owner must submit this information to GEFA no later than October 20th of any year that the construction contract is active. (Page GEFA-15)
- 9) **Certified Payrolls.** These should be submitted to the Owner weekly for the Prime Contractor and all subcontractors. The Owner must maintain payroll records and make these available for inspection. Use Department of Labor form WH-347 or a similar form that contains all of the information on the Department of Labor.

THE OWNER MUST SUBMIT INFORMATION FOR GEFA REVIEW AND CONCURRENCE TO:

Georgia Environmental Finance Authority
Attention: DBE Compliance Coordinator
233 Peachtree Street, N.E.
Harris Tower, Suite 900
Atlanta, Georgia 30303
(404)584-1000; (404)584-1069 (fax)
dbe_compliance@gefa.ga.gov

DBE COMPLIANCE FORM

ALL INFORMATION OUTLINED ON THIS FORM IS REQUIRED FOR DBE COMPLIANCE REVIEW. THE PROPOSED PRIME CONTRACTOR AND OWNER SHOULD ENSURE THAT THIS INFORMATION IS COMPLETE PRIOR TO SUBMITTAL.

Loan Recipient _____

SRF Loan Number _____

PRIME CONTRACTOR'S AND OWNER'S CERTIFICATIONS:

I certify that the information submitted on and with this form is true and accurate and that this firm 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.

(Prime Contractor signature)

Date _____

(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 Owner's State Revolving Fund loan contract.

(Signature of Owner or Owner's representative)

Date _____

(Printed name and title)

CONTACT INFORMATION

Owner contact _____

Owner phone number & email _____

Consulting Engineer contact _____

Consulting Engineer phone number & email _____

Proposed Prime Contractor _____

Prime Contractor contact _____

Prime Contractor phone number & email _____

Proposed total contract amount \$ _____

Proposed total MBE participation \$ _____ Percentage _____ Goal: 4.0 percent

Proposed total WBE participation \$ _____ Percentage _____ Goal: 4.0 percent

CONTINUED ON NEXT PAGE

Please submit the following with the DBE Compliance Form:

- 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.
- 2) Indicate in writing if no solicitations were made because the Prime Contractor intends to use only its own forces to accomplish the work.
- 3) Proof of certification by EPA, SBA, DOT (or by state, local, Tribal, or private entities whose certification criteria match EPA criteria) for each subcontractor listed as a DBE, MBE, or WBE.
- 4) Documentation of solicitation efforts for prospective DBE firms, such as fax confirmation sheets, copies of solicitation letters and e-mails, printout of online solicitations, printouts of online search results and copies and affidavits of publication in newspapers or other publications. (see also, "**Six Good Faith Efforts**", page GEFA-7).
 - a. The Prime Contractor shall use the necessary resources to identify and directly solicit no less than 3 certified MBE firms and 3 certified WBE firms to bid in each expected subcontract trade or area. If a diligent and documented search of the recommended directories does not identify 3 potential certified MBE firms and 3 potential certified WBE firms, then the Prime Contractor shall post an advertisement in the Owner's local legal organ, the Owner's official website, a regional newspaper in a larger community in the proximity, the Prime Contractor's website, or some other appropriate resource.
 - b. The Prime Contractor is encouraged to follow-up each written, fax, or e-mail solicitation with at least 1 logged phone call.
 - c. Whenever possible, post solicitations for bids or proposals for a minimum of 30 calendar days before the bid or proposal closing date.
- 5) Written justification for not selecting a certified DBE subcontractor that submitted a low bid for any subcontract area.
- 6) Certification By Proposed Prime Contractor or Subcontractor Regarding Equal Employment Opportunity (GEFA-9)
- 7) Certification By Proposed Prime or Subcontractor Regarding Debarment, Suspension, and Other Responsible Matters. (GEFA-10)
- 8) *EPA Form 6100-3 DBE Subcontractor Performance Form for all DBE subcontracts. (GEFA-12)
- 9) *EPA Form 6100-4 DBE Subcontractor Utilization Form for all DBE subcontracts. (GEFA-13)

*6100 forms are not required when all of the work is self-performed by the prime contractor.

END OF DBE COMPLIANCE FORM



DBE COMPLIANCE CHECKLIST

THE PRIME CONTRACTOR MUST SUBMIT THE FOLLOWING ITEMS TO THE OWNER BEFORE THE WORK BEGINS:

Loan Recipient _____

SRF Loan Number _____

Include in Package Submittal

PRIME CONTRACTOR ONLY	TOTAL CONTRACT AMOUNT		<p>1. DBE Compliance Form. The Owner must sign and submit this information to the Georgia Environmental Finance Authority (GEFA) to demonstrate compliance with DBE requirements. GEFA concurrence is recommended prior to award of the construction contract and is required prior to commencement of any SRF-funded construction. (Pages GEFA-4&5)</p> <p>2. Certification Regarding Equal Employment Opportunity. This form is required for the Prime Contractor and for all subcontractors. The Prime Contractor's form should be submitted with the DBE Compliance Form and the subcontractors' forms should be submitted as the subcontracts are executed. (Page GEFA-9)</p> <p>3. Certification Regarding Debarment, Suspension, & Other Responsible Matters. This form is required for the Prime Contractor and for all subcontractors. The Prime Contractor's form should be submitted with the DBE Compliance Form and the subcontractors' forms should be submitted as the subcontracts are executed. (Page GEFA-10)</p> <p>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 Prime Contractor, how much the DBE subcontractor was paid, and any other concerns the DBE subcontractor might have. The Prime Contractor must provide this form to each DBE subcontractor. The DBE subcontractor can, as an option, submit this form to the GEFA DBE Coordinator, who will forward the form to the EPA DBE Coordinator. (Page GEFA-11)</p> <p>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 Prime Contractor and the price of the work. This form is to be provided by the Prime Contractor to each DBE subcontractor and submitted with the DBE Compliance Form. (Page GEFA-12)</p> <p>6. EPA Form 6100-4 DBE Subcontractor Utilization Form. This form captures the Prime Contractor's intended use of an identified DBE subcontractor and the estimated dollar amount of the work. This form is to be completed by the Prime Contractor and submitted with the DBE Compliance Form (Page GEFA-13)</p>
ALL SUBCONTRACTORS, INCLUDING DBE FIRMS	TRADE	AMOUNT	
ALL SUBCONTRACTORS, INCLUDING DBE FIRMS	TRADE	AMOUNT	
DBE SUBCONTRACTORS ONLY	TRADE	AMOUNT	
DBE SUBCONTRACTORS ONLY	TRADE	AMOUNT	
PRIME CONTRACTOR ONLY <i>(Not applicable if self-performing all work, with no subcontracting)</i>			

Uncommitted Trades

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Documentation of Good Faith Efforts

Newspaper ads	Internet Websites	Fax Confirmation	Copies of Solicitation Emails/letters	Copies of phone logs
PROOF OF CERTIFICATION FOR EACH SUBCONTRACTOR LISTED AS A DBE, MBE, OR WBE				

SIX GOOD FAITH EFFORTS

These good faith efforts are required methods to ensure that DBEs have the opportunity to compete for procurements funded by EPA financial assistance dollars. Such good faith efforts 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 Department of Transportation (DOT), Small Business Administration (SBA), and the Minority Business Development Agency of the Department of Commerce (MBDA).
6. If the Prime Contractor awards subcontracts, it must take the steps described in items (1) through (5) listed above.

Please note that DBEs, MBEs, and WBEs must be certified by EPA, SBA, or DOT (or by state, local, Tribal, or private entities whose certification criteria match EPA's). DBEs must be certified in order to be counted toward the Prime Contractor's MBE/WBE goals. "Self-certified" DBE subcontractors will not be counted toward the Prime Contractor's MBE/WBE goals. Depending upon the certifying agency, a DBE may be classified as a DBE, a Minority Business Enterprise (MBE), or a Women's Business Enterprise (WBE).

The Prime Contractor must employ and document the **Six Good Faith Efforts** for all subcontracts, even if the Prime Contractor has achieved the fair share objectives.

The documentation of solicitations for the **Six Good Faith 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 and affidavits of publication in newspapers or other publications. The Prime Contractor is encouraged to follow up each written, fax, or e-mail solicitation with at least 1 logged phone call.

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

If a DBE subcontractor fails to complete work under the subcontract for any reason, the Prime Contractor must notify the 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 the approved DBE subcontractor list must be reported to the Owner and to GEFA on the *Changes to Approved Subcontractors Form* (GEFA-14) prior to initiation of the action. EPA Forms Nos. 6100-3 and 6100-4 must also be submitted to GEFA for new DBE subcontracts.

RESOURCES FOR IDENTIFYING DBE SUBCONTRACTORS

RESOURCES FOR IDENTIFYING DBE SUBCONTRACTOR'S FOR DIRECT SOLICITATION:

Georgia Department of Transportation (GDOT)
Disadvantaged Business Enterprise Program
(404) 631-1972

http://tomcat2.dot.state.ga.us/ContractsAdministration/uploads/rptDBE_Directory_CA_New.pdf

City of Atlanta, Georgia
Office of Contract Compliance
(404) 330-6010

<http://pro.prismcompliance.com/>

DeKalb County, Georgia
Office of Purchasing and Contracting
(404) 371-4730

<http://www.co.dekalb.ga.us/purchasing/pdf/supplierList.pdf>

Fulton County, Georgia
Purchasing and Contract Compliance
(404) 612-5800

http://www.fultoncountyga.gov/plugins/content/external_links/frameset.php?url=http%3A%2F%2Fwww.occfultoncountyga.com%2FDirectory%2FMFBEDirectoryExternal.aspx

Metropolitan Atlanta Rapid Transit Authority (MARTA)
Disadvantaged Business Enterprise Program
(404) 848-4656

<http://www.itsmarta.com/vendor-opportunities.aspx>

United States Environmental Protection Agency
http://www.epa.gov/osbp/dbe_team.htm

Teree Henderson
National DBE Program Coordinator
(202) 566-2222

henderson.teree@epa.gov

Georgia Environmental Finance Authority
DBE Compliance Coordinator
(404) 584-1000

www.gefa.ga.gov

db_compliance@gefa.ga.gov

NOTES:

- (1) The Prime Contractor shall use the necessary resources to identify and directly solicit no less than 3 certified MBE firms and 3 WBE firms to bid in each expected subcontract area or trade.
- (2) If a diligent and documented search of the recommended directories does not identify 3 potential certified MBE firms and 3 potential certified WBE firms, then the Prime Contractor shall post an advertisement in the Owner's local legal organ, the Owner's official website, a regional newspaper in a larger community in the proximity, the Prime Contractor's website, or some other appropriate resource. Whenever possible, post solicitation for bids or proposals for a minimum of 30 calendar days before the bid or proposal closing date.
- (3) 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.
- (4) The Prime Contractor should attempt to identify and first solicit DBEs in the geographic proximity of the project before soliciting those located farther away.
- (5) Contact the GEFA DBE Compliance Coordinator at (404) 584-1000 or db_compliance@gefa.ga.gov for further assistance or resources.

**CERTIFICATION BY PROPOSED PRIME CONTRACTOR OR SUBCONTRACTOR
REGARDING
EQUAL EMPLOYMENT OPPORTUNITY**

Proposed Prime Contractor
Proposed Subcontractor

This certification is required pursuant to Executive Order 11246, Part II, Section 203 (b), (30 F.R. 12319-25). Any bidder or prospective prime contractor, or any of the proposed subcontractors, shall state as an initial part of the bid or negotiations of the contract whether it has participated in any previous contract or subcontract subject to the equal opportunity clause; and, if so, whether it has filed all compliance reports due under applicable instructions.

Where the certification indicated that the prime or subcontractor has not filed a compliance report due under applicable instruction, such contractor shall be required to submit a compliance report.

(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 _____ (If YES, state what reports were filed and with what agency.)

(3) Bidder has filed all compliance reports due under applicable instructions, including SF-100 (EEO-1 Report).
YES _____ NO _____ (If NO, please explain in detail.)

The information above is true and complete to the best of my knowledge and belief. (A willfully false statement is punishable by law – U.S. Code, Title 18, Section 1001.)

PRINTED NAME & TITLE OF AUTHORIZED REPRESENTATIVE OF CONTRACTOR OR SUBCONTRACTOR

SIGNATURE OF AUTHORIZED REPRESENTATIVE

DATE

**CERTIFICATION BY PROPOSED PRIME CONTRACTOR OR SUBCONTRACTOR
REGARDING
DEBARMENT, SUSPENSION, AND OTHER RESPONSIBLE MATTERS**

Proposed Prime Contractor
Proposed Subcontractor

Under Executive Order 12549 individuals or organizations debarred from participation in Federal Assistance Programs may not receive an assistance award under federal program or sub-agreement there under for \$25,000 or more. Accordingly each recipient of a State loan or a contract (engineering or construction) awarded under a loan must complete the following certification (see 40 CFR 32.510).

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

- (a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency.
- (b) Have not within a three year period preceding this proposal been convicted of or had a civil judgement rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
- (c) Are not presently indicted for or otherwise criminally or civilly charged by a government entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (1) (b) of this certification; and
- (d) Have not within a three year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause of default.

I understand that a false statement on this certification may be grounds for rejection of this proposal or termination of the award. (A willfully false statement is punishable by law – U.S. Code, Title 18, Section 1001.)

PRINTED NAME & TITLE OF AUTHORIZED REPRESENTATIVE OF CONTRACTOR OR SUBCONTRACTOR

SIGNATURE OF AUTHORIZED REPRESENTATIVE

DATE

_____ I am unable to certify to the above statements. My explanation is as follows:

**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 DBE¹ subcontractor² 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.

Disadvantaged Business Enterprise (DBE) Program DBE Subcontractor Performance Form

This form is intended to capture the DBE¹ subcontractor's² 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: <input type="checkbox"/> DOT <input type="checkbox"/> SBA <input type="checkbox"/> Other: _____		Meets/ exceeds EPA certification standards? <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> 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.

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 DBE¹ subcontractors² 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
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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.

CHANGES TO APPROVED SUBCONTRACTORS FORM

Loan Recipient _____ SRF Loan Number _____

CERTIFICATIONS:

I certify that the information submitted on and with this form is true and accurate and that this firm 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.

 (Prime Contractor signature) Date _____

 (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 Owner's State Revolving Fund loan contract.

 (Signature of Owner or Owner's representative) Date _____

 (Printed name and title)

GENERAL INFORMATION:

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

Subcontractor Name::	Trade
Reason Terminated or Replaced	

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

New Subcontractor Name and Contact Person	Trade
Address	Telephone Number
Dollar Amount	DBE Status

- 1) 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.
- 2) Attach documentation of Six Good Faith Efforts solicitation effort for all new subcontracts.
- 3) Provide justification for not selecting any certified DBE subcontractor that submitted a low bid for any subcontract area.
- 4) For each subcontractor, attach certifications regarding Equal Employment Opportunity (GEFA-9) and certifications regarding Debarment, Suspension, and Other responsible Matters (GEFA-10)

DBE ANNUAL REPORT
FORM (5700-52A)

This form must be completed by recipients of federal financial assistance for procurement of supplies, equipment, construction or services. SRF loan recipients are required to submit this report to GEFA by the 20th of October for the previous period of October 1 through September 30. Please submit a "negative" report even if \$0 is the amount paid to MBE/WBE subcontractors during the reporting period.

ANNUAL REPORT FORM (5700-52A)			
1. PRIME CONTRACTOR		2. REPORTING PERIOD (Complete date using current year.) Period Ending (September 30, _____)	
3. SUBMIT TO: Georgia Environmental Finance Authority Attention: DBE Compliance Coordinator 233 Peachtree Street, N.E. Harris Tower, Suite 900 Atlanta, Georgia 30303 dbe_compliance@gefa.ga.gov		4. LOAN RECIPIENT (Name, Address and Telephone)	
5. LOAN RECIPIENT (OWNER) REPORTING CONTACT	PHONE:	6. TYPE OF FEDERAL FINANCIAL ASSISTANCE PROGRAM (Check one) CWSRF _____ DWSRF _____	7. SRF LOAN NUMBER
8. CONTRACTOR NAME & TOTAL CONSTRUCTION CONTRACT AMOUNT		9. ACTUAL DOLLAR AMOUNT PAID TO MBE/WBE SUBCONTRACTORS THIS PERIOD \$ MBE _____ \$ WBE _____ NEGATIVE REPORT (\$0) ____	
10. RECIPIENT'S MBE/WBE GOALS MBE 4.0 % WBE 4.0 %		11. TOTAL DOLLARS SPENT THIS PERIOD MBE \$ _____ WBE \$ _____ NON MBE/WBE \$ _____ TOTAL \$ _____	
12. NAME & TITLE OF AUTHORIZED REPRESENTATIVE OF LOAN RECIPIENT (OWNER).		13. SIGNATURE OF AUTHORIZED REPRESENTATIVE OF LOAN RECIPIENT.	14. DATE
MBE/WBE PAYMENTS MADE DURING PERIOD			
NAME & ADDRESS of DBE (SUB)CONTRACTOR (indicate if MBE or WBE firm)		TOTAL DOLLAR AMOUNT PAID & DATE PAID \$ _____ DATE _____	

SPECIAL PROVISIONS

- (a) The Prime Contractor is required to pay its subcontractors in accordance with the Georgia Prompt Payment Act (OCGA 13-11).
- (b) The Prime Contractor is required to insert the entirety of the Davis Bacon contract requirements into all subcontracts
- (c) Sewer line and water line crossing of all roads and streets shall be done in accordance with the Georgia Department of Transportation (D.O.T.) Policies and Procedures and must comply with the Ga. D.O.T. Standard Specifications, Construction of Roads and Bridges, 1993 Edition.
- (c) Construction shall be carried out so as to prevent bypassing of wastewater flow and to prevent interruption of drinking water treatment during construction. EPD must receive written notification prior to any reduction in the level of treatment and must approve all temporary modifications to the treatment process prior to the activity.
- (d) Erosion and Sedimentation Control shall be accomplished in accordance with the Georgia Erosion and Sedimentation Control Act of 1975 as currently amended and NPDES General Permits (Storm Water from Construction Sites). See also www.gaepd.org and www.gaswcc.georgia.gov for information regarding permits.
- (e) Use of Chemicals: All chemicals used during project construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer reactant or of other classification, must show approval of either EPA or USDA. Use of all such chemicals and disposal of residues shall be in conformance with State and local regulations as appropriate.
- (f) It is the duty of the Prime Contractor, the Owner and the Engineer to ensure the construction of the project, including the letting of contracts in connection therewith, shall comply with all applicable laws and regulations and requirements of the United States of America or any agency thereof, the state of Georgia or any agency thereof, territorial, or any local government laws or political subdivision and ordinances to the extent that such requirements do not conflict with Federal laws and this subchapter.
- (g) EPD, EPA, and GEFA shall have access to the site and the project work at all times.

BONDS

Bonding requirements for Contracts of \$100,000 or less are contained in the General Conditions. Bond requirements of contracts in excess of \$100,000 are:

1. Bid guarantee equivalent to five percent of the bid price. The bid guarantee shall consist of a firm commitment such as a certified check or bid bond submitted with the bid.
2. Performance bond equal to 100 percent of the contract price and;
3. Payment bond equal to 100 percent of the contract price. Bonds must be obtained from companies holding Certificates of Authority as acceptable sureties, issued by the U.S. Treasury.

SPECIAL NOTICE TO BIDDERS

By the submission of this bid, each bidder acknowledges that he understands and agrees to be bound by the equal opportunity requirements of EPA regulations (40 CFR Part 8, particularly Section 8.4 (b)), which shall be applicable throughout the performance of work under any contract awarded pursuant to this solicitation. Each bidder agrees that if awarded a contract, it will similarly bind contractually each subcontractor. In implementation of the foregoing policies, each bidder further understands and agrees that if awarded a contract, it must engage in affirmative action directed at promoting and ensuring equal employment opportunity in the workforce used under the contract (and that it must require contractually the same effort of all subcontractors whose subcontracts exceed \$10,000.00). The bidder understands and agrees that "affirmative action" as used herein shall constitute a good faith effort to achieve and maintain minority employment in each trade in the on-site workforce used on the project.

EQUAL EMPLOYMENT OPPORTUNITY NOTICE

NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL OPPORTUNITY (EXECUTIVE ORDER 11246)

1. The Offeror's or Bidder's attention is called to the Equal Opportunity Clause which is included in the nondiscrimination Provision and Labor Standards, EPA Form 5720-4 and the Standard Federal Equal Employment Opportunity (EEO) Construction Contract Specifications set forth herein.
2. The goals for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

Goals for minority participation for each trade	4.0 percent
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Goals for female participation for each trade	4.0 percent
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These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area.

The Contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(a), and its efforts to meet the goals established for the geographical area where the contract resulting from this solicitation is to be performed. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the contractor shall make a good faith effort to employ minority and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation to the contract, the Executive Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

3. The contractor shall not discriminate on the basis of race, color, national origin or sex in the performance of this contract. The contractor shall carry out applicable requirements of 40CFR Part 33 in the award and administration of contracts awarded under EPA financial assistance agreements. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract.
4. As used in this Notice, and in the contract resulting from this solicitation, the "covered area" is (insert description of the geographical area where the contract is to be performed giving the state, county and city, if any).

EEO Construction Contract Specifications (Executive Order 11246)

EEO Specifications:

1. As used in these specifications:
 - a. "Covered area" means the geographical area described in the solicitation from which this contract resulted;
 - b. "Director" means Director, Office of Federal Contract Compliance Program, United States Department of Labor, or any person to whom the Director delegates authority;
 - c. "Employer identification number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form, 941.
 - d. "Minority" includes:
 - (i) Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);
 - (ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);
 - (iii) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and
 - (iv) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).
2. Whenever the contractor, or any subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.
3. If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors or Subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or Subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.
4. The Contractor shall implement the specific affirmative action standards provided in paragraphs 7(a) through (p) of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. The Contractor is expected to make substantially uniform progress toward its goals in each craft during the period specified.

5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.
6. In order for the non-working training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.
7. The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:
 - a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.
 - b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.
 - c. Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefore, along with whatever actions the Contractor may have taken.
 - d. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.
 - e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trained programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under 7(b) above.
 - f. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.

- g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination or other employment decisions including specific review of these items with on-site supervisory personnel such as Superintendents, General Foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.
 - h. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.
 - i. Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.
 - j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's workforce.
 - k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.
 - l. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.
 - m. Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.
 - n. Ensure that all facilities and company activities are non-segregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.
 - o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.
 - p. Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.
8. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations 7(a) through (p). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the contractor is a member and participant may be asserted as fulfilling any one or more of its obligations under 7(a) through (p) of these Specifications provided that the contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, makes

a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

9. A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized).
10. The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.
11. The Contractor shall not enter into any Subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.
12. The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.
13. The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.
14. The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation, if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.
15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

Davis-Bacon and Related Acts

Labor Standards Provisions for Federally Assisted Contracts

Contract Provision for Contracts in Excess of \$2,000.

(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, <http://www.dol.gov/whd/govcontracts/dbra.htm> (E-tools)

(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 <http://www.dol.gov/whd/forms> 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 be 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.

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 that 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 thereunder 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 provide a report of compliance to the Georgia Environmental Finance Authority detailing compliance efforts and results. This report will be submitted with or prior to the loan recipient's first request for funding of construction costs, prior to final disbursement of funds from the loan, and as requested by the GEFA during the project.

(f) Subrecipients must immediately report potential violations of the DB prevailing wage requirements to the EPA DB coordinator and to the appropriate DOL Wage and Hour District Office listed at <http://www.dol.gov/whd/america2.htm>.

INSERT WAGE RATE DETERMINATION HERE

Wage Rates (for *Heavy Construction*) are state/county specific can be found at:

<http://www.dol.gov/whd/govcontracts/dbra.htm>

Sample Payroll Form (WH-347) is found at:

<http://www.dol.gov/whd/forms/wh347.pdf>

Labor Standards Interview Form (SF-1445) is found at:

<http://www.gsa.gov/portal/forms/download/115910>

Davis-Bacon (WH-1321) poster is found at:

<http://www.dol.gov/whd/regs/compliance/posters/fedprojc.pdf>
(English)

<http://www.dol.gov/whd/regs/compliance/posters/davispan.pdf>
(Spanish)

Fair Labor Standards Act Minimum Wage poster is found at:

<http://www.dol.gov/whd/regs/compliance/posters/minwagebwp.pdf>
(English)

<http://www.dol.gov/whd/regs/compliance/posters/minwagespbwP.pdf>
(Spanish)

“EEO Is the Law” poster is found at:

http://www.eeoc.gov/employers/upload/eeoc_self_print_poster.pdf
(English)

http://www.eeoc.gov/employers/upload/eeoc_self_print_poster_spanish.pdf
(Spanish)

“EEO Is the Law” poster supplement is found at:

http://www.eeoc.gov/employers/upload/eeoc_gina_supplement.pdf
(English)

http://www.eeoc.gov/employers/upload/eeoc_gina_supplement_spanish.pdf
(Spanish)

OSHA poster is found at:

<http://www.osha.gov/Publications/osha3165low-res.pdf>
(English)

<http://www.osha.gov/Publications/osha3167.pdf>
(Spanish)

"General Decision Number: GA20240063 01/05/2024

Superseded General Decision Number: GA20230063

State: Georgia

Construction Type: Heavy
Heavy Construction, Includes Water and Sewer Lines, and Heavy Construction on Treatment Plant Sites and Industrial Sites (Refineries, Power Plants, Chemical and Manufacturing Plants, Paper Mills, Etc.)

Counties: Bulloch, Candler, Emanuel, Evans, Glascock, Hancock, Jefferson, Jenkins, Johnson, Montgomery, Screven, Taliaferro, Tattnall, Toombs, Treutlen, Warren, Washington, Wheeler and Wilkes Counties in Georgia.

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 \$17.20 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 2024.
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 \$12.90 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 2024.

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 01/05/2024

SUGA2012-093 08/11/2012

	Rates	Fringes
CARPENTER (Form Work Only).....	\$ 15.00 **	0.01
CEMENT MASON/CONCRETE FINISHER...	\$ 14.11 **	1.78
ELECTRICIAN.....	\$ 20.77	0.38
LABORER: Common or General.....	\$ 11.00 **	0.00
LABORER: Pipelayer.....	\$ 11.76 **	0.00
OPERATOR: Backhoe/Excavator/Trackhoe.....	\$ 18.20	0.00
OPERATOR: Grader/Blade.....	\$ 18.88	1.32
OPERATOR: Loader.....	\$ 15.92 **	0.00
TRUCK DRIVER: Dump Truck.....	\$ 12.00 **	2.14

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 (\$17.20) or 13658 (\$12.90). 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 classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which 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. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of 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. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage

determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

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

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour National Office because National Office has responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write 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 the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write 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 by 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

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION"

CERTIFIED PAYROLL REVIEW CHECKLIST

(This is a *recommended Certified Payroll Review Checklist for the Owner's use.*)

CONTRACT ID City of CW/DWSRF#00 - 000	PRIME CONTRACTOR/SUBCONTRACTOR X Construction
GENERAL WAGE DECISION AND DATE (Insert number & date)	PAYROLL PERIOD ENDING

INSTRUCTIONS: This checklist is to be used in conjunction with projects requiring Davis-Bacon Wage Rates and compliance reviews. All certified payrolls are to be date stamped upon receipt from the prime contractor.

Payroll Information Checklist:

- _____ Prime Contractor's or subcontractor's name and address
- _____ Contract ID numbers (GEFA SRF No.)
- _____ Week ending.
- _____ Project location.

- _____ Employee ID or Last 4 digits of Social Security Number
 - _____ Social Security Number removed
 - _____ Employee's work classification
 - _____ Identification of OJTs, apprentices and program levels (%) on payrolls.
 - _____ Verify that OJT and Apprentice Program documentation is in project files.

- _____ Daily and weekly employee hours worked in each job classification.
 - _____ Daily and weekly employee overtime (or premium) hours worked
 - _____ Total weekly hours worked on all jobs (prevailing and non-prevailing wage).
 - _____ Base rate shown for each employee, overtime (or premium) rate shown when worked.
 - _____ Verify correct wage rates are being paid.
 - _____ Verify overtime is being paid correctly (over 40 hrs/wk, and Time and a half)
 - _____ Week's gross wages
 - _____ Week's itemized deductions.
 - _____ Week's net wages paid

- _____ Compliance statement attached.
 - _____ Method of fringe benefit payment described by checking either box (4)(a) or (4)(b).
 - _____ Fringe benefit package information in file and updated as needed (if 4(a) is checked)
 - _____ Exceptions explanation for fringe benefit (4)(c).
 - _____ Signature.

Compliance Review Checklist (for field reviews):

- _____ Verify work classifications reported are consistent with the work performed.
- _____ Compare payrolls with wage rate interviews when conducted.
- _____ Compare number of employees and hours worked with project documentation.

REVIEWED BY:	DATE
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GEORGIA ENVIRONMENTAL FINANCE AUTHORITY

AMERICAN IRON AND STEEL SPECIAL CONDITIONS AND INFORMATION

For

FEDERALLY ASSISTED STATE REVOLVING LOAN FUND CONSTRUCTION CONTRACTS

April 11, 2014

The following standard language must be incorporated into construction contract documents and in all solicitations for offers and bids for all construction contracts or subcontracts to be funded, in whole or in part, through the Federally-assisted State Revolving Fund in the State of Georgia for projects subject to the American Iron and Steel requirements.

These Special Conditions shall not relieve the participants in this project of responsibility to meet any requirements of other portions of this construction contract or of other agencies, whether these other requirements are more or less stringent. The requirements in these Special Conditions must be satisfied in order for work to be funded with the State Revolving Fund.

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GENERAL REQUIREMENTS

These Special Conditions are based on guidance provided by the United States Environmental Protection Agency (EPA). Public Law 113-76, the Consolidated Appropriations Act, 2014 (Act), includes an "American Iron and Steel" (AIS) requirement that requires State Revolving Loan Fund (SRF) assistance recipients to use iron and steel products that are produced in the United States for projects in this project. A copy of Section 436 of the Act is found in Appendix 3.

The products and materials subject to these requirements will be defined in Appendix 1 of these special conditions.

The Owner must maintain documentation of compliance with the AIS requirements. The documentation that the Owner maintains will be subject to review and audit by representatives of the state of Georgia, the EPA, the EPA Office of the Inspector General, and other federal authorities.

The Prime Contractor must provide certifications of compliance for all products subject to AIS requirements to the Owner prior to requesting payments for those products. The Owner or the Engineer may require certifications of compliance with submittals and shop drawings for these products as part of the submittal review process.

All manufacturing processes for a covered iron or steel product, as further defined in Appendix 1, must take place in the United States. If a covered product is taken out of the US for any part of the manufacturing process, it becomes foreign source material.

The EPA recommends the use of a step certification process to document the locations of the manufacturing processes involved with the production of steel and iron materials. A step certification is a process under which each handler (supplier, fabricator, manufacturer, processor, etc.) of the iron and steel products certifies that its step in the process was domestically performed. Each time a step in the manufacturing process takes place, the manufacturer delivers its work along with a certification of its origin. A certification should include the name of the manufacturer, the location of the manufacturing facility where the product or process took place (not its headquarters), a description of the product or item being delivered, and a signature by a manufacturer's responsible party. Attached in Appendix 2 is a sample step certification.

Alternatively, the final manufacturer that delivers the iron or steel product to the worksite, vendor, or contractor, may provide a certification asserting that all manufacturing processes for the product and for its iron and steel components occurred in the United States. The EPA states that additional documentation may be needed if the certification lacks important information and recommends step certification as the best practice. A sample final manufacturer certification is attached in Appendix 2.

The Prime Contractor may document that incidental and generally low cost components, as defined in Appendix 1, are compliant with AIS requirements under the De Minimis Waiver issued by the EPA. For these items, the Contractor must provide the Owner with documentation of costs for these items, including invoices, and a report of types and categories of materials to which the waiver is applied, the total cost of incidental components covered by the waiver for each category, and the calculations by which the total cost of materials incorporated into the project was determined. A sample De Minimis report is attached in Appendix 2.

Contractor, supplier, and manufacturer records are subject to review and audit by the EPA, its Inspector General, and other federal authorities.

Failure to comply with these requirements may delay, limit, or prevent the disbursement of SRF funds to the Owner. Violations of AIS requirements will require correction by the Contractor as determined by the Owner and Engineer, including replacement of deficient products with compliant products and compensation for costs and other damages that may result. Violations may also subject the Owner, the Contractor, and suppliers to other enforcement actions within the discretion of the EPA and other federal authorities.

The Act permits EPA to issue waivers for a case or category of cases in which EPA finds (1) that applying these requirements would be inconsistent with the public interest; (2) iron and steel products are not produced in the US in sufficient and reasonably available quantities and of a satisfactory quality; or (3) inclusion of iron and steel products produced in the US will increase the cost of the overall project by more than 25 percent. The Contractor should notify the Owner and Engineer immediately if it finds that a waiver may be required.

By submitting a bid for this project and by executing this construction contract, the Contractor acknowledges to and for the benefit of the Owner and the state of Georgia that it understands that the goods and services under this Agreement are being funded with monies made available by the Clean Water State Revolving Fund or the Drinking Water State Revolving Fund and that Federal law authorizing these Funds contains provisions 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 Requirement") 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 Owner and the state of Georgia 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 Owner or the state of Georgia. Notwithstanding any other provision of this Agreement, any failure to comply with this paragraph by the Contractor shall permit the Owner or the state of Georgia to recover as damages against the Contractor any loss, expense, or cost (including without limitation attorney's fees) incurred by the Owner or the state of Georgia resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the state of Georgia or any damages owed to the state of Georgia by the Owner). The Owner and the Contractor agree that the state of Georgia, as a lender to the Owner for the funding of its project, 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 of Georgia.

Appendix 1 – Definitions

For purposes of the Clean Water State Revolving Fund (CWSRF) and Drinking Water State Revolving Fund (DWSRF) projects that must comply with the AIS requirement, an iron or steel product is one of the following made primarily of iron or steel that is permanently incorporated into the project:

Lined or unlined pipes or fittings;
Manhole Covers;
Municipal Castings (defined in more detail below);
Hydrants;
Tanks;
Flanges;
Pipe clamps and restraints;
Valves;
Structural steel (defined in more detail below);
Reinforced precast concrete (defined in more detail below); and
Construction materials (defined in more detail below).

Product primarily of iron or steel: The product must be made of greater than 50% iron or steel, measured by cost. If one of the listed products is not made primarily of iron or steel, United States (US) provenance is not required, except as required for reinforced precast concrete. If a product is composed of more than 50% iron or steel, but is not listed in Section 436 (a) (2) of the Act, it is not required to be produced in the US. Alternatively, the iron or steel in such a product can be sourced from outside the US.

Steel: An alloy that includes at least 50 percent iron and between 0.02 and 2 percent carbon and may include other elements. Other alloys of iron are not required to be produced in the US.

Produced in the United States: Production in the US of the iron or steel products used in the project requires that all manufacturing processes, including application of coatings, must take place in the United States, with the exception of metallurgical processes involving refinement of steel additives. All manufacturing processes includes processes such as melting, refining, forming, rolling, drawing, finishing, fabricating and coating. Further, if a domestic iron and steel product is taken out of the US for any part of the manufacturing process, it becomes foreign source material. However, raw materials such as iron ore, limestone and iron and steel scrap are not covered by the AIS requirement, and the material(s), if any, being applied as a coating are similarly not covered. Non-iron or steel components of an iron and steel product may come from non-US sources. For example, for products such as valves and hydrants, the individual non-iron and steel components do not have to be of domestic origin.

Municipal Castings: Municipal castings are cast iron or steel infrastructure products that are melted and cast. They typically provide access, protection, or housing for components incorporated into utility owned drinking water, storm water, wastewater, and surface infrastructure. They are typically made of grey or ductile iron, or steel. Examples of municipal castings include access hatches, ballast screen, benches, bollards, cast bases, cast iron hinged hatches, cast iron riser rings, catch basin inlets, cleanout/monument boxes, construction covers and frames, curb and corner guards, curb openings, detectable warning plates, downspout shoes, drainage grates, frames & curb inlets, inlets, junction boxes, lampposts, manhole covers, rings & frames, risers, meter boxes, steel hinged hatches, steel riser rings, trash receptacles, tree grates, tree guards, trench grates, and valve boxes.

Structural Steel: Structural steel is rolled flanged shapes, having at least one dimension of their cross-section 3 inches or greater, which are used in the construction of bridges, buildings, ships, railroad rolling stock, and for numerous other constructional purposes. Such shapes are designated as wide-flange shapes, standard I-beams, channels, angles, tees and zees. Other shapes include H-piles, sheet piling, tie plates, cross ties, and those for other special purposes.

Reinforced Precast Concrete: While reinforced precast concrete may not be at least 50% iron or steel, in this particular case, the reinforcing rebar must be produced in the US and meet the same standards as for any other iron or steel product. Additionally, the casting of the concrete product must take place in the US. The cement and other raw materials used in concrete production are not required to be of domestic origin. If the reinforced concrete is cast at the construction site, the reinforcing rebar is considered to be a construction material and must be produced in the US.

Construction Materials subject to AIS: Construction materials are those articles, materials, or supplies made primarily of iron and steel, that are permanently incorporated into the project, not including mechanical and/or electrical components, equipment and systems. Some of these products may overlap with what is also considered “structural steel”. This includes, but is not limited to, the following products: welding rods, wire rod, bar, angles, concrete reinforcing bar, wire, wire cloth, wire rope and cables, tubing, framing, joists, trusses, fasteners (i.e., nuts and bolts), decking, grating, railings, stairs, access ramps, fire escapes, ladders, wall panels, dome structures, roofing, ductwork, surface drains, cable hanging systems, manhole steps, fencing and fence tubing, guardrails, doors, gates, and screens.

Construction Materials not subject to AIS: Mechanical and/or electrical components, equipment and systems are not considered construction materials. Mechanical equipment is typically that which has motorized parts and/or is powered by a motor. Electrical equipment is typically any machine powered by electricity and includes components that are part of the electrical distribution system.

The following examples, including their appurtenances necessary for their intended use and operation, are NOT considered construction materials: pumps, motors, gear reducers, drives, variable frequency drives (VFDs), mixers, blowers/aeration equipment, compressors, meters, electric/pneumatic/manual accessories used to operate valves (such as valve actuators), gates, motorized screens (such as traveling screens), sensors, controls, switches, supervisory control and data acquisition (SCADA), membrane bioreactor systems, membrane filtration systems, filters, clarifiers and clarifier mechanisms, rakes, grinders, disinfection systems, dewatering equipment, presses (including belt presses), conveyors, cranes, HVAC (excluding ductwork), water heaters, heat exchangers, generators, cabinetry and housings (such as electrical boxes/enclosures), lighting fixtures, electrical conduit, emergency life systems, metal office furniture, shelving, laboratory equipment, and analytical instrumentation.

Items temporarily used during construction, which are removed from the project site upon completion of the project, are not required to be made of U.S. Iron or Steel. For example, trench boxes or scaffolding are not considered construction materials subject to AIS requirements.

Incidental Components compliant with AIS under the De Minimis Waiver: This waiver permits the use of de minimis incidental components that may otherwise be prohibited under AIS. These de minimis items may cumulatively comprise no more than a total of 5 percent of the total cost of the materials used in and incorporated into the project. The cost of an individual item may not exceed 1 percent of the total cost of the materials used in and incorporated into the project.

These items are miscellaneous, generally low-cost components that are essential for, but incidental to, the construction and are permanently incorporated into the project. For many of these incidental components, the country of manufacture and the availability of alternatives are not always readily or reasonably identifiable prior to procurement in the normal course of business. For other incidental components, the country of manufacture may be known, but the miscellaneous character in conjunction with the low cost, individually and in total, as typically procured in bulk, mark them as properly incidental. Examples of incidental components include small washers, screws, fasteners (i.e., nuts and bolts), miscellaneous wire, corner bead, ancillary tube.

Examples of items that are not incidental and are not covered by the De Minimis Waiver include significant process fittings (i.e., tees, elbows, flanges, and brackets), distribution system fittings and valves, force main valves, pipes for sewer collection and/or water distribution, treatment and storage tanks, large structural support structures.

Items covered as compliant under this waiver must be documented in a report to the Owner to demonstrate that they are both incidental and that they fall within the cost allowances of this waiver. The costs of these items must be documented by invoices. The report must include a listing of types and categories of materials to which the waiver is applied, the total cost of incidental components covered by the Waiver for each category, and the calculations by which the total cost of materials incorporated into the project was determined.

Appendix 2 – Sample Certifications Step Certification

The following information is provided as a sample letter of step certification for American Iron and Steel compliance. Documentation must be provided on company letterhead. This is to be provided by each handler (supplier, fabricator, manufacturer, processor, etc.). Each time a step in the manufacturing process takes place, the handler delivers its work along with a certification of its origin.

Date

Company Name
Company Address
City, State Zip

Subject: American Iron and Steel Step Certification for Project (Insert project name and SRF number)

I, (company representative), certify that the (melting, bending, coating, galvanizing, cutting, etc.) process for (manufacturing or fabricating) the following products and/or materials shipped or provided for the subject project is in full compliance with the American Iron and Steel requirement as mandated in EPA's State Revolving Fund Programs.

List of items, products and/or materials:

If any of the above compliance statements change while providing material to this project we will immediately notify the prime contractor and the engineer.

Signed by company representative

Appendix 2 – Sample Certifications

Final manufacturer certification

The following information is provided as a sample letter of the final manufacturer to certify American Iron and Steel compliance for the entire manufacturing process. Documentation must be provided on company letterhead.

Date

Company Name
Company Address
City, State Zip

Subject: American Iron and Steel Certification for Project (Insert project name and SRF number)

I, (company representative), certify that the following products and/or materials shipped/provided to the subject project are in full compliance with the American Iron and Steel requirement of P.L. 113-76 and as mandated in EPA's State Revolving Fund Programs.

List of items, products and/or materials:

If any of the above compliance statements change while providing material to this project we will immediately notify the prime contractor and the engineer.

Signed by company representative

Appendix 2 – Sample Certifications Contractor De Minimis Report

Owner: (Owner Name)

SRF Project No: (SRF Number)

Project Description: (Contract title or brief description)

Date: (Date of report)

Submitted by (name & title): (Contractor representative)
Company Name

**LIST OF MATERIALS
OR CATEGORIES OF MATERIALS
PERMANENTLY INCORPORATED
INTO THE PROJECT**

	COST
Category or Item	\$1,000.00
Category or Item	\$1,000.00
Category or Item	\$1,000.00
Category or Item	\$1,000.00
Category or Item	\$1,000.00
Category or Item	\$1,000.00
Category or Item	\$1,000.00
Category or Item	\$1,000.00
Category or Item	\$1,000.00
Category or Item	\$1,000.00

Total Permanent Materials **\$10,000.00**

1 % of total material cost	\$100.00	Maximum cost for individual item waived
5 % of total material cost	\$500.00	Maximum cumulative cost for category waived

**LIST OF MATERIALS
OR CATEGORIES OF MATERIALS
COVERED BY
DE MINIMIS WAIVER**

	COST	COMPLIANT (Yes/No)
Category or Item	\$100.00	Yes
Category or Item	\$100.00	Yes
Category or Item	\$100.00	Yes
Category or Item	\$100.00	Yes
Category or Item	\$100.00	Yes

Total De Minimis Items **\$500.00** **Yes**

INVOICES ATTACHED FOR DE MINIMIS ITEMS.

Appendix 3 – P.L. 113-76, Consolidated Appropriations Act, 2014

The Act states:

Sec. 436 (a)(1) None of the funds made available by a State water pollution control revolving fund as authorized by title VI of the Federal Water Pollution Control Act (33 U.S.C. 1381 et seq.) or made available by a drinking water treatment revolving loan fund as authorized by section 1452 of the Safe Drinking Water Act (42 U.S.C. 300j–12) shall be used for a project for the construction, alteration, maintenance, or repair of a public water system or treatment works unless all of the iron and steel products used in the project are produced in the United States.

(2) In this section, the term “iron and steel products” means the following products made primarily of iron or steel: lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, and construction materials.

(b) Subsection (a) shall not apply in any case or category of cases in which the Administrator of the Environmental Protection Agency (in this section referred to as the “Administrator”) finds that—

(1) applying subsection (a) would be inconsistent with the public interest;

(2) iron and steel products are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quality; or

(3) inclusion of iron and steel products produced in the United States will increase the cost of the overall project by more than 25 percent.

(c) If the Administrator receives a request for a waiver under this section, the Administrator shall make available to the public on an informal basis a copy of the request and information available to the Administrator concerning the request, and shall allow for informal public input on the request for at least 15 days prior to making a finding based on the request. The Administrator shall make the request and accompanying information available by electronic means, including on the official public Internet Web site of the Environmental Protection Agency.

(d) This section shall be applied in a manner consistent with United States obligations under international agreements.

(e) The Administrator may retain up to 0.25 percent of the funds appropriated in this Act for the Clean and Drinking Water State Revolving Funds for carrying out the provisions described in subsection (a)(1) for management and oversight of the requirements of this section.

(f) This section does not apply with respect to a project if a State agency approves the engineering plans and specifications for the project, in that agency’s capacity to approve such plans and specifications prior to a project requesting bids, prior to the date of the enactment of this Act.

GEORGIA ENVIRONMENTAL FINANCE AUTHORITY

BUILD AMERICA, BUY AMERICA ACT SPECIAL CONDITIONS AND INFORMATION for FEDERALLY ASSISTED STATE REVOLVING LOAN FUND CONSTRUCTION CONTRACTS

The following memorandum issued by the U.S. Environmental Protection Agency on November 3, 2022, provides implementation guidance for the Build America, Buy America Act (BABA). Exhibit D of the Georgia Environmental Finance Authority Loan Agreement requires compliance with BABA as needed. The following two links contain the required language for agreements.

[Appendix 1](#) language is required to be inserted into construction contracts to comply with BABA.

[Appendix 2](#) language is incorporated by reference into Exhibit D of GEFA's State Revolving Fund assistance agreements.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF WATER

November 3, 2022

MEMORANDUM

SUBJECT: Build America, Buy America Act Implementation Procedures for EPA Office of Water Federal Financial Assistance Programs

FROM: Radhika Fox
Assistant Administrator

A handwritten signature in black ink, appearing to be "R. Fox", written over a light blue horizontal line.

TO: EPA Regional Water Division Directors, Regions I – X
EPA Office of Water Office Directors

OVERVIEW

The Biden-Harris Administration recognized the Nation's critical need for infrastructure investment, championing the Bipartisan Infrastructure Law (BIL), which Congress passed on November 15, 2021 (also known as the Infrastructure Investment and Jobs Act (IIJA)). The BIL will provide an unprecedented level of federal investment in water and wastewater infrastructure in communities across America.

In Title IX of the IIJA, Congress passed the Build America, Buy America (BABA) Act, which establishes strong and permanent domestic sourcing requirements across all Federal financial assistance programs for infrastructure. The U.S. Environmental Protection Agency (EPA) Office of Water is honored to help lead the implementation of these provisions and is proud of its near decade of successful implementation of the American Iron and Steel (AIS) provisions for its flagship water infrastructure programs.

This is a transformational opportunity to build a resilient supply chain and manufacturing base for critical products here in the United States that will spur investment in good-paying American manufacturing jobs and businesses. EPA's efforts to implement BABA will help cultivate the domestic manufacturing base for a wide range of products commonly used across the water sector but not currently made domestically. This will take time, and flexibility will be important to ensure that EPA can leverage critical water investments on time and on budget to protect public health and improve water quality.

IMPLEMENTATION

Recognizing the opportunity and need for BABA implementation guidance, the Made in America Office (MIAO) of the Office of Management and Budget (OMB) published [Initial Implementation Guidance on Application of Buy America Preference in Federal Financial Assistance Programs for Infrastructure](#) (OMB Guidance M-22-11) on April 18, 2022. The guidance provides government-wide implementation direction for all Federal financial assistance programs for infrastructure. Despite the extensive guidance developed by MIAO, EPA's Office of Water infrastructure investment programs have received many questions that were not addressed in OMB Guidance M-22-11 or that require further clarification for EPA water infrastructure programs. The following questions and answers serve to supplement OMB Guidance M-22-11 with implementation procedures specific to EPA's relevant water infrastructure programs.

Section 70914(a) of the IIJA states when a Buy America preference under BABA applies: "Not later than... [May 14, 2022], the head of each Federal agency shall ensure that none of the funds made available for a Federal financial assistance program for infrastructure... may be obligated for a project unless all of the iron, steel, manufactured products, and construction materials used in the project are produced in the United States." Therefore, Federal financial infrastructure investments obligated on or after May 14, 2022, must comply with the BABA requirements. Absent a waiver, all iron, steel, manufactured products, and construction materials permanently incorporated into an infrastructure project subject to the BABA requirements must be produced in the United States. For many of EPA's Office of Water infrastructure investment programs, the vast majority of products permanently incorporated into construction, maintenance, or repair projects must comply with the BABA requirements, with the exception of select construction materials (cement and cementitious materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives), which are specifically excepted by the BABA statute.

EPA's Office of Water implements many infrastructure investment programs subject to BABA requirements, including the following:

- Alaska Native Villages and Rural Communities Water Grant Program (ANV) (and any associated Interagency Agreements with the Indian Health Service)
- Clean Water and Drinking Water State Revolving Fund Programs (CW and DWSRF)
- Clean Water and Drinking Water Grants to U.S. Territories and the District of Columbia
- Clean Water Indian and Drinking Water Tribal Infrastructure Grant Set-aside (and any associated Interagency Agreements with the Indian Health Service)
- Coastal Wetlands Planning, Protection and Restoration Act, (CWPPRA) Programs
- Congressionally Directed Spending/Community Project Funding (also known as Community Grants)
- Geographic Programs¹
- Gulf Hypoxia Program
- National Estuaries Program (CWA Section 320)

¹ Geographic Programs include: Great Lakes Restoration Initiative, Chesapeake Bay, San Francisco Bay, Puget Sound, Long Island Sound, Gulf of Mexico, South Florida, Lake Champlain, Lake Pontchartrain, Southern New England Estuaries, Columbia River Basin, Pacific Northwest

- 319 Nonpoint Source Management Program Implementation
- Reducing Lead in Drinking Water Grant Program (SDWA §1459B)
- Assistance for Small and Disadvantaged Communities Grants: Small, Underserved, and Disadvantaged Community Grant Program (SUDC), Emerging Contaminants in Small or Disadvantaged Communities (EC-SDC) and Drinking Water Infrastructure Resilience & Sustainability (SDWA §1459A)
- Sewer Overflow and Stormwater Reuse Municipal Grants (OSG)
- USMCA Implementing Legislation (Section 821 and Title IX, USMCA Supplemental Appropriations, 2020)
- U.S.-Mexico Border Water Infrastructure Program
- Voluntary School and Child Care Program Lead Testing and Remediation Grant Program (SDWA 1464(d))
- Water Infrastructure Finance and Innovation Act (WIFIA)

The questions and answers in this document apply to the implementation of BABA requirements for the Office of Water infrastructure programs listed above unless superseded by regulation, statute, or other applicable guidance. For many of the programs listed above which did not have domestic preference requirements prior to BABA, additional implementation details are pending or may be developed after the issuance of these procedures. In addition, EPA notes that more direction will be helpful to inform the determination and definition of domestic content in manufactured goods. Supplemental guidance on these and other issues, from either OMB or EPA, may be forthcoming. These implementation procedures may also apply to additional, unlisted EPA programs which may be required to apply BABA subsequent to publication of this memorandum (e.g., future funding programs which have been authorized, but not yet appropriated).

For more information on the BABA requirements, visit the EPA Office of Water’s dedicated website – <https://www.epa.gov/cwsrf/build-america-buy-america-baba> – or contact your funding authority (such as your grants officer, portfolio manager, or state contact). For information on approved waivers, visit <https://www.epa.gov/cwsrf/build-america-buy-america-baba-approved-waivers>. You may also email questions to BABA-OW@epa.gov.

This Implementation Procedures document is organized to provide responses to questions in the following topic areas:

- Section 1: General..... 4
- Section 2: Product Coverage..... 5
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- Appendix 1: Example Build America, Buy America (BABA) Act Construction Contract Language..... 22
- Appendix 2: Example Build America, Buy America (BABA) Act Assistance Agreement Language..... 23

QUESTIONS AND ANSWERS

SECTION 1: GENERAL

- Q1.1: Will EPA provide documentation for BABA for bid solicitations and suggested contract language? Will EPA provide suggested language for Assistance Agreements?
 - A1.1: See Appendix 1, which includes suggested language for construction contracts which addresses the BABA requirements. In addition to the language suggested in Appendix 1, EPA also recommends that assistance recipients prepare contract bid solicitation documents with a statement for the consulting engineers and construction firms as follows: “By signing payment application and recommending payment, Contractor certifies they have reviewed documentation for all products and materials submitted for payment, and the certifications are sufficient to demonstrate compliance with Build America, Buy America Act requirements.” In most cases, the assistance recipient’s representatives assume the responsibility for their clients to conduct due diligence on compliance with applicable domestic preference requirements.

All Federal Financial infrastructure assistance agreements subject to BABA must have a clause requiring compliance with the requirements. See Appendix 2 for example assistance agreement language.

- Q1.2: Would federally-financed infrastructure projects outside of the United States need to comply with the BABA requirements?
 - A1.2: No. According to the OMB Guidance (M-22-11), a “project” is defined as “...any activity related to the construction, alteration, maintenance, or repair of infrastructure in the United States.” Therefore, the BABA requirements are not implicated for infrastructure projects occurring outside of the United States, such as projects funded through the United States-Mexico-Canada Agreement with infrastructure activities occurring in Mexico or Canada (that is, outside the United States).
 -
- Q1.3: If most of the project is BABA compliant, and a small portion is not, can an assistance recipient self-fund (i.e., paying with non-federal dollars) the non-compliant products?
 - A1.3: Any project that is funded in whole or in part with federal assistance must comply with the BABA requirements, unless the requirements are otherwise waived. All iron, steel, manufactured products, and construction materials used in a project must meet the BABA requirements unless waived. Absent a waiver, there is no “small portion” or product that does not need to satisfy the BABA requirements unless the requirements are waived (or specifically excluded as is the case for cement and cementitious materials; aggregates such as stone, sand, or gravel; aggregate binding agents or additives; or non-permanent products). An assistance recipient may request a waiver or inquire as to whether a broad waiver, such as a *de minimis* waiver, might apply.

- Q1.4: How do international trade agreements affect the implementation of the BABA requirements?
 - A1.4: The BABA requirements apply in a manner consistent with United States obligations under international trade agreements. Typically, these obligations only apply to direct procurement by the entities that are signatories to these trade agreements. In general, assistance recipients are not signatories to such agreements, so these trade agreements have no impact on BABA implementation. In the few instances where such an agreement applies to a municipality, that municipality is responsible for determining its applicability and requirements and communicating with the funding authority (such as EPA and/or a state) on the actions taken to comply with BABA.

SECTION 2: PRODUCT COVERAGE

- Q2.1: For products made of iron and steel, what is the difference between predominantly and primarily iron and steel?
 - A2.1: EPA considers the terms “predominantly” and “primarily” to be interchangeable, such that a product is considered predominantly (or primarily) iron and steel if it contains greater than 50 percent iron and steel by material cost.
- Q2.2: What is the definition of construction materials (with examples)?
 - A2.2: From OMB Guidance M-22-11: “construction materials” include an article, material, or supply (other than an item of primarily iron or steel; a manufactured product; cement and cementitious materials; aggregates such as stone, sand, or gravel; aggregate binding agents or additives; or non-permanent products) that is or consists primarily of:
 - non-ferrous metals,
 - plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables), (including optic glass),
 - lumber, and
 - drywall.

For example, a plate of glass would be a construction material under BABA, but a framed window that incorporates the glass into a frame would be a manufactured product. Another common construction material for water infrastructure projects would be polyvinyl chloride (PVC) pipe and fittings. However, if PVC components are incorporated into a more complex product such as instrumentation and control equipment or a water treatment unit, those items would be manufactured products.

- Q2.3: What are manufactured products (with examples)?
 - A2.3: From OMB Guidance M-22-11: “...all manufactured products used in the project are produced in the United States—this means the manufactured product was manufactured in the United States; and the cost of the components of the manufactured product that are mined, produced, or manufactured in the United States is greater than 55 percent of the total

cost of all components of the manufactured product, unless another standard for determining the minimum amount of domestic content of the manufactured product has been established under applicable law or regulation...”

The manufactured products category would cover the majority of potential water infrastructure products, including complex products made up of a variety of material types and components. For water infrastructure projects, common manufactured products would include, but not be limited to, pumps, motors, blowers, aerators, generators, instrumentation and control systems, gauges, meters, measurement equipment, treatment equipment, dewatering equipment, actuators, and many other mechanical and electrical items.

- Q2.4: Which category will valves fall under for BABA? Will it differ from the American Iron and Steel (AIS) requirements?
 - A2.4: For programs that are subject to BABA and AIS (SRF, WIFIA, and Community Project Funding), projects using valves should classify them as iron and steel products under BABA as long as their material cost is made up of more than 50 percent iron and/or steel. Valves with 50 percent or less iron and/or steel by material cost would be considered manufactured products under the BABA requirements.

In accordance with OMB Guidance M-22-11, an article, material, or supply should be classified into only one of the three categories: iron and steel, manufactured products, or construction materials. Under the AIS requirements, all valves made primarily of iron and steel (that is, those with iron and/or steel material cost greater than 50 percent) must comply with the AIS requirements. For BABA, EPA interprets Section IV of OMB Guidance M-22-11 to mean that iron and steel products are those items that are primarily iron and steel, the same as for the AIS requirements.

- Q2.5: Does EPA have a list of products to be classified as “Iron and Steel” under BABA?
 - A2.5: Although this list is not comprehensive, the following products were classified as AIS products if made primarily (more than 50 percent) of iron and/or steel by materials cost (for programs subject to both AIS and BABA, this list would be equivalent for “iron and steel” items or products under either requirement):

Products likely made “primarily” of iron and steel to be classified as <u>Iron and Steel</u> under BABA		
Lined and Unlined Pipe	Lined and Unlined Fittings	Tanks
Flanges	Pipe Clamps and Restraints	Structural Steel
Valves	Hydrants	Pre-Cast, Iron/Steel Reinforced Concrete (of all types, regardless of iron/steel content percentage)
Manhole Covers and other Municipal Castings	Access Hatches	Ballast Screens
Iron or Steel Benches	Bollards	Cast Bases
Cast Iron Hinged Hatches	Cast Iron Riser Rings	Catch Basin Inlets
Cleanout/Monument Boxes	Construction Covers and Frames	Curb and Corner Guards

Products likely made “primarily” of iron and steel to be classified as <u>Iron and Steel</u> under BABA		
Curb Boxes	Curb Openings	Curb Stops
Detectable Warning Plates	Downspout Shoes	Drainage Grates
Drainage Grate Frames and Curb Inlets	Inlets	Junction Boxes
Lampposts	Manhole Rings and Frames	Manhole Risers
Meter Boxes	Service Boxes	Steel Hinged Hatches
Steel Riser Rings	Trash Receptacles	Tree Grates
Tree Guards	Trench Grates	Valve Boxes
Valve Box Covers and Risers	Access Ramps	Aeration Pipes and Fittings (separate from aeration/blowers)
Angles	Backflow Preventers/Double Check Valves	Baffle Curtains
Iron or Steel Bar	Bathroom Stalls	Beam Clamps
Cable Hanging Systems	Clarifier Tanks	Coiled Steel
Column Piping	Concrete Reinforcing Bar, Wire, and Fibers	Condensate Sediment Traps
Corrugated Pipe	Couplings	Decking
Digester Covers	Dome Structures	Door Hardware
Doors	Ductwork	Expansion Joints
Expansion Tanks (diaphragm, surge, and hydropneumatics)	Fasteners	Fencing and Fence Tubing
Fire Escapes	Flanged Pipe	Flap Gates
Framing	Gate Valves	Generic Hanging Brackets
Grating	Ground Testing Boxes	Ground Test Wells
Guardrails	HVAC Registers, Diffusers, and Grilles	Joists
Knife Gates	Ladders	Lifting Hooks, J-bar, Connectors within, and Anchors for Concrete
Lockers	Man Baskets and Material Platforms	Manhole Steps
Mud Valves	Municipal Casting Junctions	Non-mechanical (aka stationary) Louvers and Dampers
Overhead Rolling Doors/ Uplifting Doors (manual open, no motor)	Pipe Connectors	Pipe Hangers
Pipe Pilings (any type of steel piling)	Pipe Spool (pipe, flanges, connectors, etc.)	Pipe Supports
Pitless Adaptors	Pre-fab Steel Buildings/Sheds (simple structure, unfurnished)	Pre-stressed Concrete Cylinder Pipe (PCCP)
Railings	Reduced Pressure Zone (RPZ) Valves	Roofing
Service Saddles	Sheet Piling	Sinks (not part of eyewash systems)
Solenoid Valves	Stairs	Static Mixers
Stationary Screens	Surface Drains	Tapping Sleeves
Telescoping Valves	Tipping Buckets	Trusses
Tubing	Valve Stem Extensions	Valve Stems (excluding handwheels and actuators)
Wall Panels	Wall Sleeves/Floor Sleeves	Welding Rods
Well Casing	Well Screens	Wire
Wire Cloth	Wire Rod	Wire Rope and Cables

Q2.6: Does EPA have a list of products that could be made “primarily” of iron and steel but would be classified as “manufactured products” under BABA?

A2.6: Although this list is not comprehensive, the following products would be considered “manufactured products” under the BABA requirements, even if the item might be composed primarily of iron and steel by materials cost (Note: These items are not subject to the AIS requirements.):

Products likely made “primarily” of iron and steel to be classified as <u>Manufactured Products</u> under BABA		
Actuator Superstructures/ Support Structures	Aeration Nozzles and Injectors	Aerators
Analytical Instrumentation	Analyzers (e.g., ozone, oxygen)	Automated Water Fill Stations
Blowers/Aeration Equipment	Boilers, Boiler Systems	Chemical Feed Systems (e.g., polymer, coagulant, treatment chemicals)
Chemical Injection Quills	Chemical Injectors	Clarifier Mechanisms/Arms
Compressors	Controls and Switches	Conveyors
Cranes	Desiccant Air Dryer Tanks	Dewatering Equipment
Dewatering Roll-offs	Disinfection Systems	Drives (e.g., variable frequency drives)
Electric/Pneumatic/Manual Accessories Used to Operate Valves (such as electric valve actuators)	Electrical Cabinetry and Housings (such as electrical boxes/enclosures)	Electrical Conduit
Electrical Junction Boxes	Electronic Door Locks	Elevator Systems (hydraulic, etc.)
Emergency Life Systems (including eyewash stations, emergency safety showers, fire extinguishers, fire suppression systems including sprinklers /piping/valves, first aid, etc.)	Exhaust Fans	Fall Protection Anchor Points
Fiberglass Tank w/Appurtenances	Filters (and appurtenances, including underdrains, backwash systems)	Flocculators
Fluidized Bed Incinerators	Galvanized Anodes/Cathodic Protection	Gear Reducers
Generators	Geothermal Systems	Grinders
Heat Exchangers	HVAC (excluding ductwork)	HVAC Dampers (if appurtenances to aerators/blowers)
HVAC Louvers (mechanical)	Intake and Exhaust Grates (if appurtenances to aerators/blowers)	Instrumentation
Laboratory Equipment	Ladder Fall Prevention Systems	Ladder Safety Posts
Lighting Fixtures	Lightning and Grounding Rods	Mechanical or Actuated Louvers/Dampers
Membrane Bioreactor Systems	Membrane Filtration Systems	Metal Office Furniture (fixed)
Meters (including flow, wholesale, water, and service connection)	Motorized Doors (unit)	Motorized Mixers
Motorized Screens (such as traveling screens)	Motors	Pelton Wheels
Pipeline Flash Reactors (similar to injectors)	Plate Settlers	Precast Concrete without Iron/Steel Reinforcement

Products likely made “primarily” of iron and steel to be classified as <u>Manufactured Products</u> under BABA		
Furnished Pre-fab Buildings (such as furnished with pumps, mechanics inside)	Presses (including belt presses)	Pressure Gauges
Pump Cans/Barrels and Strainers	Pumps	Mechanical Rakes
Safety Climb Cable	Sampling Stations (unless also act as hydrant)	Scrubbers
Sensors	Sequencing Batch Reactors (SBR)	Steel Shelving (fixed)
Slide and Sluice Gates	Spray Header Units	Steel Cabinets (fixed interior/furniture)
Supervisory Control and Data Acquisition (SCADA) Systems	Tracer Wire	Valve Manual Gears, Actuators, Handles
Voltage Transformer	Water Electrostatic Precipitators (WESP)	Water Heaters
Weir Gates		

- Q2.7: Is asphalt paving a covered product under BABA?
 - A2.7: No. EPA interprets Section 70917(c) of the IIJA to exclude asphalt from BABA requirements. Asphalt paving is a type of concrete composed of an aggregate material mixed with a binder (bitumen). EPA considers asphalt concrete to be excluded by section 70917(c) due to its similarities with cement and cementitious materials.

SECTION 3: CO-FUNDING

- Q3.1: If projects are co-funded with funding mechanisms that don’t require BABA, must the entire project comply with BABA?
 - A3.1: Yes. Any project that is funded in whole or in part with federal assistance must comply with the BABA requirements, unless the requirements are otherwise waived. A “project” consists of all construction necessary to complete the building or work regardless of the number of contracts or assistance agreements involved so long as all the contracts and assistance agreements awarded are closely related in purpose, time, and place. This precludes the intentional splitting of projects into separate and smaller contracts or assistance agreements to avoid BABA’s applicability on some portions of a larger project, particularly where the activities are integrally and proximately related to the whole. However, there are many situations in which major construction activities are clearly undertaken in separate phases that are distinct in purpose, time, or place, in which case, separate contracts or assistance agreements would carry separate requirements.

- Q3.2: How will project requirements be determined for co-funded projects subject to potentially different general applicability/programmatic waiver conditions (such as different adjustment period waivers)?
 - A3.2: OMB Guidance M-22-11 addresses cases with project co-funding from separate programs. EPA would apply the guidance’s “cognizant” program determination to projects that are co-funded with different general applicability/programmatic waivers. For instance, if a project were co-funded between WIFIA and SRF and the majority of the Federal funding for the project is from WIFIA, then WIFIA would be the “cognizant” program for application and determination of waivers. In that case, any conditions from an applicable WIFIA waiver would apply.

SECTION 4: WAIVERS

- Q4.1: Who may apply for a waiver and how do you apply?
 - A4.1: Assistance recipients and their authorized representatives may apply for a project-specific waiver. EPA does not accept waiver requests from suppliers, distributors, or manufacturers unless the assistance recipient endorses and submits the request on its own behalf to the funding authority. In the case where multiple programs are providing federal funds to the project, the assistance recipient should submit the waiver request to the cognizant program, the one providing the greatest amount of federal funds for the project. For information on applying for cost waivers, see questions 4.4 and 4.5. For information on the SRF program roles and responsibilities, see question 7.6.

Project-specific waiver requests should generally include: (1) a brief summary of the project, (2) a description and explanation of the need for the waiver for the product(s) in question, (3) a brief summary of the due diligence conducted in search of domestic alternatives (which could include correspondence between assistance recipient and supplier/distributors), (4) the quantity and materials of the product(s) in question, (5) all engineering specifications and project design considerations relevant to the product(s) in question, (6) the approximate unit cost of items (both foreign and domestic) in addition to an estimated cost of the materials and overall project, (7) the date any products will be needed on site in order to avoid significant project schedule disruptions, and (8) any other pertinent information relevant to EPA’s consideration of the waiver (e.g., if relevant for SRF projects: whether the project is designated as an equivalency project, the date the plans and specifications were submitted to the state, the date of construction initiation, expected date of project completion, any special considerations such as local zoning and building ordinances, seismic requirements, or noise or odor control requirements).

In the case of indirect federal assistance, such as the SRF programs, the state authority reviews and conveys the waiver request to EPA. States should submit waiver requests to the appropriate program waiver request inbox. For SRF projects, please use CWSRFWaiver@epa.gov or DWSRFWaiver@epa.gov.

- Q4.2: Can an assistance recipient request a waiver based on a specification written for a specific brand or model of product (that is, a specification that names a branded item or model)?
 - A4.2: In most cases, performance-based specifications are expected and required for the majority of infrastructure projects funded by EPA’s financial assistance programs. In rare cases where “branded” or product-specific sourcing may be included in project specifications, it is suggested that the specifications include the item in question (that is, not simply a catalog page, but also materials of construction, sizing, quantities, and applicable engineering performance design characteristics for the project, etc.) in addition to the standard phrase “or equal.” For the purposes of product alternative market research, EPA will evaluate the BABA requirements based on performance-based engineering specifications for the product(s) in question. If the project’s specifications do not include performance-based specifications, or at least an “or equal” designation, EPA will base its research on an “or equal” designation using best professional judgment to the extent practicable.

- Q4.3: If a manufactured product is not readily available domestically, will EPA provide short-term “limited availability” product waivers?
 - A4.3: EPA will address the unavailability of domestic products through the waiver process, including potential national short-term waivers for specific products, if appropriate. To the extent practicable and with the intent to maximize domestic market and supply chain development, EPA intends to address issues of broad product unavailability with targeted, time-limited, and conditional waivers, as prescribed in OMB Guidance M-22-11. EPA will follow its robust and thorough product research processes (those put into place for the AIS requirements for the SRF and WIFIA programs and expanded for the new BABA requirements) to identify and determine those products for which proposed national/general applicability waivers may be appropriate.

- Q4.4: What information is needed when applying for a cost waiver under BABA?
 - A4.4: As part of the cost waiver request, the assistance recipient must demonstrate that implementation of the BABA requirements will increase the overall project cost more than 25 percent. Depending on the circumstances of the overall project cost increases, documentation to justify the cost waiver can vary but may include itemized cost estimates or bid tabulations comparing project costs with and without BABA implementation. Assistance recipients should begin assessing the potential cost impacts of the BABA requirements during the design phase of a project.

- Q4.5: Can administrative costs associated with tracking and verification of certifications be considered when determining if the cost of a project increases by 25 percent or more?
 - A4.5: Yes. Section 70914(b)(3) of the IIJA states that a waiver may be provided if the overall cost of the project increases by more than 25 percent due to the “inclusion of iron, steel, manufactured products, or construction materials produced in the United States.” EPA interprets this to mean that the “inclusion” of the BABA-covered products could encompass

reasonable administrative costs associated with complying with the BABA requirements, such as staff, contractor, and technological resources to collect and track BABA compliance documentation.

- Q4.6: How can assistance recipients and construction contractors address product delivery delays?
 - A4.6: Assistance recipients should reasonably plan for material procurement to account for known potential supply chain issues or extended lead times and shall notify the funding authority well in advance of the issues so that prompt attention can be given to explore options. Where extended lead times for compliant products are impacting project schedules and may significantly impact construction progress, timely communication with the funding agency is important. For products that are unavailable within a reasonable timeframe to meet the objectives and schedule of a project, EPA may consider a non-availability waiver with adequate justification. An assistance recipient would need to apply for the waiver and contact its funding authority (such as EPA and/or a state) to initiate the waiver process.

SECTION 5: DOCUMENTING COMPLIANCE

- Q5.1: Who will be responsible for BABA enforcement?
 - A5.1: Responsibility for BABA implementation applies at all levels, from manufacturers to suppliers and distributors, construction contractors, assistance recipients, and funding authorities.

The manufacturers have responsibility to provide adequate and accurate documentation of the products manufactured. If suppliers and distributors are involved, they are responsible for passing along compliance documentation for products supplied to projects that are subject to the BABA requirements.

The assistance recipient and their representatives are primarily responsible for ensuring the documentation collected for products used on the project is sufficient to document compliance with the BABA requirements.

The funding authority is responsible for providing oversight and guidance as needed to ensure the proper implementation of the requirements. The Uniform Grants Guidance (UGG) (Title 2 of the Code of Federal Regulations (CFR) Part 200) applies to many Federal financial assistance agreements that will include BABA requirements. The general provisions of 2 CFR Part 200 determine the responsible party for the grant funding authority.

For information on SRF program roles and responsibilities, see question 7.6.

At all levels, where fraud, waste, abuse, or any violation of the law is suspected, the Office of Inspector General (OIG) should be contacted immediately. The OIG can be reached at 1-888-546-8740 or OIG_Hotline@epa.gov. More information can be found at this website: <http://www.epa.gov/oig/hotline.htm>.

- Q5.2: When will the BABA requirements be assessed for compliance? Do assistance recipients need to have waivers for potential non-domestic products before assistance agreements are in place, at the time products are procured or products are incorporated into the project (i.e., used)?
 - A5.2: Compliance is assessed where the domestic product is used (or installed) at the project site. Proper compliance documentation, whether it is a BABA certification letter or a waiver, should accompany a product prior to its “use”, in accordance with Section 70914(a) of IIJA. This may occur prior to assistance agreements being in place but is not necessary. Additionally, communication of BABA requirements through appropriate Terms and Conditions in financial assistance agreements and in project solicitation and contract documents is key in ensuring all parties involved are informed of the requirements for the project before construction is underway.

- Q5.3: How can product compliance with the BABA requirements be demonstrated?
 - A5.3: Assistance recipients and their representatives should ensure that the products delivered to the construction site are accompanied by proper documentation that demonstrate compliance with the law and be made available to the funding authority upon request. The documentation may be received and maintained in hard copy, electronically, or could be embedded in construction management software. The use of a signed certification letter for the project is the most direct and effective form of compliance documentation for ensuring products used on site are BABA-compliant prior to their installation; however, other forms of documentation are also acceptable as long as collectively, the following can be demonstrated:
 - (1) Documentation linked to the project. For example, this can be in the form of the project name, project location, contract number, or project number.
 - (2) Documentation linked to the product used on the project. For example, description of product(s) (simple explanation sufficient to identify the product(s)), or an attached (or electronic link to) purchase order, invoice, or bill of lading.
 - (3) Documentation includes statement attesting that the products supplied to the assistance recipient are compliant with BABA requirement. Reference to the Infrastructure Investment and Jobs Act (“IIJA”) or the Bipartisan Infrastructure Law (BIL) are also acceptable. For iron and steel items under BABA, references to the American Iron and Steel (AIS) requirements are also acceptable and reciprocal with BABA for such items.
 - (4) Documentation that manufacturing occurred in the United States, which could include, for example, the location(s) of manufacturing for each manufacturing step that is being certified. It is acceptable for manufactured products to note a single point of manufacturing, documenting that the final point of manufacturing is in the United States. Note that each BABA category may require different determinations for compliance.
 - (5) Signature of company representative (on company letterhead and signature can be electronic). The signatory of the certifying statement affirms their knowledge of the manufacturing processes for the referenced product(s) and attests that the product meets the BABA requirements.

In addition to compliance documentation, assistance recipients or their representatives should also conduct a visual inspection of the product when it arrives to the project site, especially for iron and steel products which are often stamped with the country of origin. (Note: A country of origin stamp alone is not sufficient verification of compliance with BABA and assistance receipts should not rely on it to ensure compliance.)

EPA may develop alternative procedures for demonstrating compliance. Additional project- or program-specific instructions may be developed on a case-by-case basis in order to meet individual circumstances.

- Q5.4: Will EPA provide a form or template for tracking and documenting compliance?
 - A5.4: EPA does not require a specified format for tracking or documenting compliance. Assistance recipients are free to develop any system (from simple to complex software) for tracking items used on the project and the accompanying compliance documentation, e.g., certification letters, applicable waivers, if it helps with implementation and compliance. Elements that may help with keeping track of compliance may include: product description, quantity required/used, product category (i.e., iron and steel, manufactured product, or construction material), status of obtaining certification letter, product cost, and whether the item might qualify as *de minimis*, or qualify under another applicable waiver.
- Q5.5: If a manufacturer claims to comply with the Buy American Act, does it also comply with BABA?
 - A5.5: No. With the exception of the AIS requirements – which EPA interprets to be equivalent to the “iron and steel” requirements under BABA – EPA does not have an interpretation about the comparability of other domestic preference requirements relative to BABA. Any products that are to be certified as compliant with BABA should include a specific reference to the BABA requirements and appropriate attestation from a responsible manufacturing company official. See Question 5.3 for EPA’s recommendations for BABA certification letters.
- Q5.6: How will assistance recipients manage certification letters for hundreds, possibly thousands of products?
 - A5.6: EPA recognizes that the new BABA requirements will cover most products used in typical water and wastewater infrastructure projects, and that the number of items which may require certification at large and/or complex projects may reach several hundred. EPA is concerned about the potential administrative burden that this would place on assistance recipients. EPA recommends that projects with a high number of potentially covered products meet with their funding authority about potential compliance strategies to minimize burden and streamline compliance activity. Assistance recipients should prepare contract bid solicitation documents with a statement for the consulting engineers and construction firms as follows: “By signing payment application and recommending payment, Contractor certifies they have reviewed documentation for all products and materials submitted for payment, and the documentation is sufficient to demonstrate compliance with Build America,

Buy America Act requirements.” In most cases, the assistance recipient’s representatives may assume the responsibility for their clients to conduct due diligence on compliance with applicable domestic preference requirements.

- Q5.7: Who is responsible for documenting the 55 percent content requirement for manufactured products under BABA? What if the final manufacturer cannot trace or verify domestic origin for all components?
 - A5.7: The manufacturer who signs a certification letter is responsible for documenting compliance with any of the three categories of products (iron and steel, manufactured products, or construction materials). For manufactured products, BABA requires that greater than 55 percent of the total cost of all components of the manufactured product be from domestic sources. EPA recommends that the certification letter for manufactured products document whether the item passes the content test in the final product along with a statement attesting to compliance with the BABA requirements for manufactured products.
- Q5.8: How do final product fabricators document compliance when the final step of manufacturing may be simply assembling components?
 - A5.8: It is acceptable, in many cases, especially for highly complex manufactured products that utilize many sub-components, for the final point of assembly to certify without using a “step certification” process. Multiple certifications (i.e., step certifications) or a singular certification can be used for a product, as long as the certifying official is willing to attest to the product’s compliance with BABA requirements at all stages of manufacturing.
- Q5.9: Will Material Test Reports be acceptable in lieu of a BABA certification for iron and steel?
 - A5.9: Material Test Reports (MTRs, commonly referred to as “Mill Certifications” or “Mill Certs”) provide the chemical composition of steel and iron from a mill or foundry. If an MTR accompanies the delivery of steel or iron to a project site with an invoice or bill of lading, EPA will consider it sufficient to demonstrate compliance (equivalent to a certification letter) as long as the MTR includes a manufacturer representative’s signature in addition to the location (city and state) of the mill/foundry. It is common for MTRs to be the first letter in a “step certification” if the product is further fabricated or painted, etc., by another manufacturer.
- Q5.10: Can a manufacturer use a fillable certification letter for products?
 - A5.10: EPA recommends that certifications be signed by representatives of the manufacturing entity. EPA does not oppose manufacturers using forms to internally develop letters within their company, thereby providing signed, non-manipulable certification letters to suppliers, distributors, and/or assistance recipients. A fillable form that can be changed by someone outside of the manufacturer after signature does not demonstrate compliance and may create compliance concerns for the manufacturer or assistance recipient.

- Q5.11: Are product certifications from suppliers and distributors allowed?
 - A5.11: EPA recommends that representatives of product manufacturers certify compliance and discourages suppliers and distributors from creating certification letters. EPA does not rule out the possibility that a third-party certification process, such as a certification by a distributor, may be viable. However, EPA is currently not aware of a system or proposed system that meets the EPA’s recommendations for documentation of product certification.

- Q5.12: How long should assistance recipients keep compliance documentation?
 - A5.12: Assistance recipients should apply recordkeeping requirements for the project according to the procedures dictated by the funding authority. For most EPA grant programs, this is prescribed in the UGG at 2 CFR 200.334-200.338; e.g., the SRF programs require a minimum of three years. Other funding programs may require longer documentation retention periods.

SECTION 6: PROGRAMS WITH AMERICAN IRON AND STEEL REQUIREMENTS

- Q6.1: Does BABA supersede the American Iron and Steel (AIS) Requirements?
 - A6.1: The BABA requirements for items considered “iron and steel” are equivalent to those for covered iron and steel products under the AIS requirements in the Clean Water Act and the Safe Drinking Water Act. These requirements apply to the CWSRF, DWSRF, WIFIA, and Water infrastructure Community Grants. BABA includes a “Savings Provision” (Section 70917(b)) that states that BABA does not affect existing domestic content procurement preferences for infrastructure projects funded by Federal financial assistance programs that meet the requirements of section 70914. EPA views the AIS requirements as meeting the “iron and steel” product requirements of BABA Section 70914, as they both include the key requirement that items made of iron and steel be wholly manufactured in the United States from the point of melting and/or pouring the iron or steel components through final manufacturing step. Because of the “Savings Provision” of Section 70917, the AIS requirements satisfy the “iron and steel” requirements of BABA. For the programs that have AIS requirements, EPA intends to implement BABA requirements the same way for iron and steel items as it has done for AIS products.

- Q6.2: For iron and steel products, does a manufacturer need to demonstrate compliance from initial melting through the finished product?
 - A6.2: For iron and steel products, the BABA requirements are the same as the existing AIS requirements, in that all of the iron and steel in a covered product (that is, the product is comprised of more than 50 percent iron and steel by material cost) must be melted and poured in the United States and all subsequent manufacturing processes (such as grinding, rolling, bending, reheating, and casting) must occur in the United States.

Q6.3: Will EPA apply the same manufacturing standards for BABA iron and steel products as for the American Iron and Steel (AIS) requirements?

- A6.3: Yes. For AIS, EPA did not require raw materials used in the production of steel or iron to be domestically sourced. For BABA, EPA interprets the requirements to be the same. Hence, like AIS, raw materials in the production of iron and steel subject to BABA requirements would not need to be domestically sourced. The key step for both AIS and BABA domestic iron and/or steel production is the melting/pouring (that is, the location of the furnace), which must be in the United States.
- Q6.4: Will the certification process be similar to the process established for the American Iron and Steel requirements?
 - A6.4: EPA expects the certification process for the BABA requirements to be very similar to that established for the AIS requirements. For iron and steel products, the process should remain the same for AIS and BABA. EPA recommends for manufactured products and for construction materials that certification letters include direct reference to the product/material content requirements under BABA, in addition to an affirmative statement verifying that the product meets the BABA requirements.
- Q6.5: Will duplicate certification letters be required for AIS and BABA for iron/steel products?
 - A6.5: No. Compliance with BABA requirements will be sufficient to demonstrate compliance with AIS requirements for iron and steel products. If a project is subject to BABA, the only demonstration of compliance necessary is with the BABA requirements, of which the iron and steel requirements are equivalent to those of the AIS statutory requirements: the iron or steel in a product made primarily or predominantly of iron and steel (comprising more than 50 percent iron and steel by material cost) must be melted and/or poured in the United States and all subsequent manufacturing processes must occur in the United States.

SECTION 7: PROGRAM-SPECIFIC ISSUES

- Q7.1.: How do the BABA requirements apply to Community Grants?
 - A7.1: The Community Project Funding/Congressionally Directed Spending grants for the construction of drinking water, wastewater, and stormwater infrastructure and for water quality protection are subject to the requirements specified in the explanatory statement accompanying the Consolidated Appropriations Act (Explanatory Statement for Division G of P.L. 117-13, the Consolidated Appropriations Act of 2022). The explanatory statement asserts: “Applicable Federal requirements that would apply to a Clean Water State Revolving Fund or Drinking Water State Revolving Fund project grant recipient shall apply to a grantee receiving a CPF grant under this section.” Therefore, the federally funded Community Project Funding/Congressionally Directed Spending grants are subject to the same requirements that apply to CWSRF or DWSRF projects, including BABA and AIS requirements. See also A1.2.

- Q7.2: Should SRF projects covered by the BABA SRF Projects Design Planning Adjustment Period Waiver follow the same procedures for demonstrating compliance as outlined for American Iron and Steel requirements?
 - A7.2: Yes. The SRF Design Planning Adjustment Period waiver does not waive the iron and steel requirements under BABA. The SRF programs have existing domestic preference requirements for SRF projects under CWA Section 608 and SDWA Section 1452(a)(4) (AIS requirements) to use iron and steel products that are produced in the United States. Sections 70917(a) and (b) of BIL explain the application of BABA to existing domestic preference requirements. Specifically, the savings provision in Section 70917(b) states that existing domestic preference requirements that meet BABA requirements are not affected by BABA. The statutory AIS requirements were existing at the time BABA became law and satisfy the BABA iron and steel requirements. Therefore, the statutory AIS requirements that have previously applied to SRF-funded projects will continue to do so, and compliance with AIS requirements will satisfy the BABA iron and steel requirements. Demonstration of compliance for iron and steel products will follow the AIS implementation policies for projects subject to the waiver.

- Q7.3: For SRF programs, is BABA considered a federal cross-cutting authority? (i.e., do “equivalency” rules apply?)
 - A7.3: Yes, BABA is considered a federal cross-cutting requirement that applies to SRF assistance equivalent to the federal capitalization grant (i.e., “equivalency” projects). EPA’s SRF regulations at 40 CFR 35.3145 and 35.3575 require states and recipients of SRF funds equivalent to the amount of the federal capitalization grant to comply with federal cross-cutting requirements. Section 70914 of the IIJA, which states when a Buy America preference applies, explains that “none of the funds made available for a Federal financial assistance program for infrastructure...may be obligated for a project unless all of the iron, steel, manufactured products, and construction materials used in the project are produced in the United States.” Therefore, BABA only applies to projects funded in an amount equivalent to the federal capitalization grant and not to those projects receiving funds in excess of the capitalization grant (i.e., “non-equivalency” projects). (Note: The AIS requirements continue to apply for all SRF projects, including non-equivalency projects, and all WIFIA and Community Grant projects, because equivalency does not apply.)

- Q7.4: Do the BABA requirements apply to Drinking Water State Revolving Fund set-asides?
 - A7.4: Due to requirements related to the deposit of funds in the DWSRF program, almost all of the funds used to conduct set-aside activities are Federal dollars. Therefore, Federal cross-cutting requirements must be applied to all set-aside activities. However, in the case of most set-aside activities, the cross-cutting requirements will not be implicated because of the nature of the activities conducted under the set-asides. Because the BABA requirements only apply to infrastructure, and infrastructure typically is not an eligible set-aside expenditure (with one potential exception being loans for incentive-based source water protection

measures under the Local Assistance and Other State Programs Set-Aside), the BABA requirements will not apply to most set-aside activities.

- Q7.5: What if an SRF project is refinanced using Federal financial assistance on or after May 14, 2022?
 - A7.5: If an SRF project began construction, financed from another funding source, prior to May 14, 2022, but is refinanced through an assistance agreement executed on or after that date, BABA requirements will apply to all construction that occurs on or after May 14, 2022, through completion of construction, unless a waiver applies. There is no retroactive application of the BABA requirements where a refinancing occurs for an SRF project that has completed construction prior to May 14, 2022. (Note: If SRF funding is used for the refinancing, the AIS requirements may still apply depending on the timing of construction.)
- Q7.6: What are the roles and responsibilities for SRF programs for BABA implementation?
 - A7.6: Implementation of the BABA requirements for the State Revolving Fund programs will continue the roles and responsibilities from the successful AIS implementation process.

As with AIS, it is both the assistance recipient's and the state's responsibility to ensure compliance with the BABA requirements. The state is the recipient of a federal capitalization grant and must comply with all grant conditions, including a condition requiring adherence to BABA requirements.

Consequently, states are strongly advised to conduct site visits of projects during construction and review documentation demonstrating the assistance recipient's proof of compliance. In EPA's experience, most states conduct periodic site visits and arrange timely meetings with funded projects. Observed best practices typically include a meeting early in the process (sometimes before bid and usually prior to commencing construction) and at least one project site visit during the construction process. Assistance recipients must maintain documentation of compliance with the BABA requirements, as explained in question 5.3. The documents must be kept by the assistance recipient and should be reviewed by the state during project reviews.

The state's role in the waiver process is to review any waiver requests submitted to the state to ensure that all necessary information has been provided by the assistance recipient prior to forwarding the request to EPA. If a state finds the request lacking, the state should work with the assistance recipient to help obtain complete information. Question 4.1 explains the information needed by EPA to expediently review a waiver request.

In order to implement the BABA requirements, EPA has developed an approach for effective and efficient implementation of the waiver process to allow projects to proceed in a timely manner. The framework described below will allow states, on behalf of the assistance recipients, to apply for waivers of the BABA requirements directly to EPA Headquarters. Only waiver requests received and/or endorsed from states will be considered. Pursuant to BABA, EPA has the responsibility to make findings as to the issuance of waivers to the BABA requirements.

Step-by-step SRF Waiver Process

The waiver process begins with the assistance recipient. To fulfill the BABA requirements, the assistance recipient must in good faith design the project (where applicable) and solicit bids for construction with American-made iron and steel, manufactured goods, and construction materials. It is essential that the assistance recipient include the BABA terms in any request for proposals or solicitations for bids, and in all contracts (see Appendix 2 for sample construction contract language). The assistance recipient may receive a waiver at any point before, during, or after the bid process, if one or more of three statutory conditions is demonstrated to EPA and approved.

To apply for a project-specific waiver, the assistance recipient should email the request in the form of a Word document (.doc) or editable PDF (.pdf) to the funding program. It is strongly recommended that each state identify a person or persons for BABA communications. The state designee(s) will review the application for the waiver and determine whether the necessary information has been included (Note: More information may be provided in the future regarding what information is required to be included in waiver requests). Once the waiver application is complete, the designee will forward the application to CWSRFWaiver@epa.gov or DWSRFWaiver@epa.gov.

Evaluation by EPA

After receiving an application for waiver of the BABA requirements and ensuring sufficient information was provided, EPA will publish the request on its website for 15 days and receive public comment. EPA will then determine whether the application properly and adequately documents and justifies the statutory basis cited for the waiver.

In the event that EPA finds that adequate documentation and justification has been submitted, the Administrator may grant a waiver to the assistance recipient. EPA will notify the state designee whether a waiver request has been approved or not approved as soon as such a decision has been made. Granting such a waiver is a four-step process:

1. Research – After receiving an application for a waiver, EPA will perform market research to determine whether the iron, steel, manufactured goods, or construction materials are available domestically.
2. Posting – After research, if no domestic product has been identified, EPA is required to publish the application and all material submitted with the application on EPA's website for 15 days. During that period, the public will have the opportunity to review the request and provide informal comment to EPA. The website can be found at: <https://www.epa.gov/cwsrf/build-america-buy-america-baba-waivers-open-public-comment>.
3. Evaluation – After receiving an application for waiver of the BABA requirements, EPA will determine whether the application properly and adequately documents and justifies the statutory basis cited for the waiver to determine whether or not to grant the waiver.

3. Signature of waiver approval by the Administrator or another agency official with delegated authority – As soon as the waiver is signed and dated, EPA will notify the State SRF program and post the signed waiver on the Agency’s website. The assistance recipient should keep a copy of the signed waiver in its project files.

(Note: Additional steps may be required in the future regarding the waiver process depending on additional guidance from OMB)

APPENDIX 1

Example Build America, Buy America (BABA) Act Construction Contract Language

ALL CONSTRUCTION CONTRACTS MUST HAVE A CLAUSE REQUIRING COMPLIANCE WITH THE BABA REQUIREMENTS. THIS IS AN EXAMPLE OF WHAT COULD BE INCLUDED IN A PROJECT'S CONSTRUCTION CONTRACT. EPA MAKES NO CLAIMS REGARDING THE LEGALITY OF THIS CLAUSE WITH RESPECT TO STATE OR LOCAL LAW:

The Contractor acknowledges to and for the benefit of the _____ (“Owner”) and the _____ (the “Funding Authority”) that it understands the goods and services under this Agreement are being funded with federal monies and have statutory requirements commonly known as “Build America, Buy America;” that requires all of the iron and steel, manufactured products, and construction materials used in the project to be produced in the United States (“Build America, Buy America Requirements”) including iron and steel, manufactured products, and construction materials provided by the Contactor pursuant to this Agreement. The Contractor hereby represents and warrants to and for the benefit of the Owner and Funding Authority (a) the Contractor has reviewed and understands the Build America, Buy America Requirements, (b) all of the iron and steel, manufactured products, and construction materials used in the project will be and/or have been produced in the United States in a manner that complies with the Build America, Buy America Requirements, unless a waiver of the requirements 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 Build America, Buy America Requirements, as may be requested by the Owner or the Funding Authority. Notwithstanding any other provision of this Agreement, any failure to comply with this paragraph by the Contractor shall permit the Owner or Funding Authority to recover as damages against the Contractor any loss, expense, or cost (including without limitation attorney’s fees) incurred by the Owner or Funding Authority resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the Funding Authority or any damages owed to the Funding Authority by the Owner). If the Contractor has no direct contractual privity with the Funding Authority, as a lender or awardee to the Owner for the funding of its project, the Owner and the Contractor agree that the Funding 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 Funding Authority.

APPENDIX 2

Example Build America, Buy America (BABA) Act Assistance Agreement Language

ALL FEDERAL FINANCIAL INFRASTRUCTURE ASSISTANCE AGREEMENTS MUST HAVE A CLAUSE REQUIRING COMPLIANCE WITH THE BABA REQUIREMENTS. THIS IS AN EXAMPLE OF WHAT COULD BE INCLUDED IN AN ASSISTANCE AGREEMENT (E.G., SRF LOAN AGREEMENT). EPA MAKES NO CLAIMS REGARDING THE LEGAL SUFFICIENCY OF THIS CLAUSE WITH RESPECT TO STATE LAW:

Comply with all federal requirements applicable to the assistance received (including those imposed by the Infrastructure Investment and Jobs Act (“IIJA”), Public Law No. 117-58) which the Participant understands includes, but is not limited to, the following requirements: that all of the iron and steel, manufactured products, and construction materials used in the Project are to be produced in the United States (“Build America, Buy America Requirements”) unless (i) the Participant has requested and obtained a waiver from the cognizant Agency¹¹ pertaining to the Project or the Project is otherwise covered by a general applicability waiver; or (ii) all of the contributing Agencies have otherwise advised the Participant in writing that the Build America, Buy America Requirements are not applicable to the Project.

Comply with all record keeping and reporting requirements under all applicable legal authorities, including any reports required by the funding authority (such as EPA and/or a state), such as performance indicators of program deliverables, information on costs and project progress. The Participant 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 applicable legal requirements and this Agreement may result in a default hereunder that results in a repayment of the assistance agreement in advance of the maturity of the Bonds, termination and/or repayment of grants, cooperative agreements, direct assistance or other types of financial assistance, and/or other remedial actions.

¹¹ From OMB Guidance M-22-11: To avoid a need for duplicative waiver requests from entities that receive funding for one infrastructure project through multiple Federal agencies, the Federal agency contributing the greatest amount of Federal funds for the project should be considered the “Cognizant Agency for Made in America” and should take responsibility for coordinating with the other Federal awarding agencies. Such coordination will provide uniform waiver criteria and adjudication processes, minimize duplicative efforts among Federal agencies, and reduce burdens on recipients. The Cognizant Agency for Made in America shall be responsible for consulting with the other Federal awarding agencies, publicizing the proposed joint waiver, and submitting the proposed joint waiver for review to MIAO.

TECHNICAL SPECIFICATIONS

SECTION 01010
SUMMARY OF WORK

1. SCOPE

This project consists of all work shown in the contract documents.

In general, construction shall consist of rehabilitation of two lift stations, construction of a new lift station, and extension of an existing force main. Work will entail removal and replacement of pumps, control panels, fence, gates, floats, etc. The project will also require construction of a new wet well, lift station site, valves, piping, setting dog house manhole, installing sanitary sewer pipe, and installing force main of various size by means of open cut and jack and bore. Force main installation will require sawcut removal/replace of driveways and asphalt overlay for impacted areas. Bypass pumping will be required as needed to keep wet wells drawn down to maintain compliance during construction.

END OF SECTION

**SECTION 01020
ALLOWANCES**

PART 1 – GENERAL

- A. The Contractor shall include in his bid proposal the allowances stated herein. The final amount of any allowance item listed herein shall be adjusted accordingly by change order to reflect actual cost.

PART 2 – PRODUCT

- A. The Contractor shall allow the sum of \$60,000 for payment to Georgia Power to bring increased power feeds to LS #2 and LS #6. Lift Station #2 shall be upgraded to allow for the installation of larger pumps. Lift Station #6 will be upgraded for larger pumps and changed from a single phase to a 3-phase feed.
- B. The Contractor shall allow the sum of \$100,000 for Supplemental Work Additions (SWA's). SWA shall be utilized to incorporate cost changes for any additional authorized work into the scope of work up to the amount budgeted above. Contract change orders shall be enforced for contract changes over and above this amount. These SWA's shall authorize the Contractor to perform additions to work, but the Contractor shall perform no work until written authorization has been delivered to the Contractor by the City. Contractor should not expect that any SWA's will be issued; SWA's shall be issued at the discretion of the City only.

The value of any work covered by a SWA shall be determined in one of the following ways:

1. Where the work involved is covered by unit prices contained in the Contract Documents, by application of unit prices to the quantities of the item involved (subject to the provisions of General Conditions, paragraph 11.3).
 2. By mutual acceptance of a lump sum by Contractor and the Owner.
 3. On the basis of the cost of the work plus a Contractor's Fee for overhead and profit.
- C. The SWA allowance may be utilized for any testing requested by the Engineer or City that is in addition to the required testing called for in Specification 01410 – Testing Services. The Testing will be utilized from the SWA only at the direction of the City or Engineer, and will be performed only after receipt of written authorization delivered to the contractor by the city.

PART 3 – EXECUTION

- A. Amounts stated shall include all taxes, coordination and handling that may be required to provide the equipment to the owner. The Owner may choose to delay the purchase of equipment to the end of the contract.

END OF SECTION

**SECTION 01025
MEASUREMENT AND PAYMENT**

PART 1 – GENERAL

1.01 SCOPE OF WORK

- 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. The Bid lists each item of the Project for which payment will be made. No payment will be made for any items other than those listed in the Bid.
- C. Required items of work and incidentals necessary for the satisfactory completion of the work which are not specifically listed in the Bid, and which are not specified in this Section to be measured or to be included in one of the items listed in the Bid, shall be considered as incidental to the work and whose cost shall be included in the item of the bidder's choice. All costs thereof, including Contractor's overhead for costs and profit, shall be considered as included in the lump sum or unit prices bid for the various Bid items. The Contractor shall prepare the Bid accordingly.
- D. Work includes furnishing all labor, equipment, tools, and materials which are not furnished by the Owner, and performing all operations required to complete the work satisfactorily, in place, as specified and as indicated on the Drawings.

1.02 MEASUREMENT OF WORK

- A. Measurement methods delineated in the individual specification sections complement the criteria of this section. In the event of conflict, the requirements of the individual specification section govern.
- B. Work shall be measured by the Engineer or his representative with assistance from the Contractor prior to preparation of a payment request by the Contractor.
- C. Unit quantities that are measured in place shall be measured as they are placed. The Contractor shall give the Engineer a minimum of two days' notice for making all required measurements.
- D. Materials that must be measured as delivered shall be measured at the time of delivery by the Engineer or his representative; the Contractor shall provide sufficient advance notice so that such measurements can be made.
- E. Work necessary for a complete and operational job, such as relocation of mailboxes

or fences, removal of trees, removal/hauling/disposal of excess site materials, protection of utilities (including power poles and relocation of guy wires), relocation of utilities, graveling/maintaining driveways and driving lanes, field engineering, clearing and grubbing, etc., not specifically identified as a pay item shall be included in the unit price bid of the bidder's choosing. No additional payments will be made for such activities.

1.03 ESTIMATED QUANTITIES

All estimated quantities for unit price items, stipulated in the BID FORM, or other Contract Documents, are approximate and are to be used as a basis for comparing the bids submitted for the Project. The actual amounts of work done and materials furnished under unit price items may differ from the estimated quantities. The basis of payment for work and materials will be the actual amount of work done and materials furnished. The Contractor agrees to make no claim for damages, anticipated profits or otherwise on account of any difference between the amounts of work actually furnished and the estimated amounts included in the BID FORM. The Contractor will not be paid for any work which exceeds the quantity set forth in the BID FORM without a change order issued before the work is performed unless specifically ordered in writing by the Engineer. The Contractor will provide assistance to the Engineer to check quantities and elevations when so requested.

1.04 MEASUREMENT OF QUANTITIES

- A. Measurement by Weight – Concrete reinforcing steel, rolled or formed steel or other metal shapes will be measured by handbook weights. Welded assemblies will be measured by handbook or scale weight.
- B. Measurement by Volume – Measured by cubic dimension using mean length, width and height or thickness.
- C. Measurement by Area – Measured by square dimension using mean length and width or radius.
- D. Linear Measurement – Measured by linear dimension, at the item centerline or mean chord.
- E. Stipulated Sum/Price Measurement – Items measured by weight, volume, area, or linear means or combination, as appropriate, as a completed item or unit of the Work.

1.05 PROGRESS PAYMENTS

- A. Progress payments shall be based on percentage of work complete for lump sum pay items and units installed for unit price pay items.

- B. All items of Work not specifically listed in the Bid Schedule shall be considered incidental to the construction, and the cost of all such work and material shall be included in the item of the Contractors choice.
- C. All items listed for measurement and payment shall include all materials, labor, and equipment necessary to successfully and satisfactorily complete Work specified.
- D. Payment – The Contractor will receive payment only for the items listed in the Bid Schedule of his contract, and no separate payments will be made for the work under any section of the Contract Documents except as provided for in the Bid Form. Where measurements are required to be made by the Engineer, for the payment of a pay item, the failure of the Contractor to give the adequate notification or failure of the Contractor to give the engineer assistance for the measurement shall result in the forfeiture of payment for the work or item which was not measured.

1.06 SUPPLEMENTAL WORK ALLOWANCE

- A. Supplemental Work Allowances (SWA's) shall be utilized to incorporate cost changes for any additional authorized work into the scope of work up to the amount budgeted in the BID FORM. Contract change orders shall be enforced for contract changes over and above the amount budgeted as SWA. SWA's shall authorize the Contractor to perform additions to work, but the Contractor shall perform no work until written authorization has been delivered to the Contractor by the Engineer or Owner. Contractor should not expect that any SWA's will be issued; SWA's shall be issued at the discretion of the Owner only.

The value of any work covered by a SWA shall be determined in one of the following ways:

1. Where the work involved is covered by unit prices contained in the Contract Documents, by application of unit prices to the quantities of the item involved (subject to the provisions of General Conditions, Article 11, paragraph 11.3 inclusive).
2. By mutual acceptance of a lump sum by Contractor and the Owner.
3. On the basis of the cost of the work plus a Contractor's Fee for overhead and profit. This basis shall be as established for Change Orders in General Conditions.

PART 2 – PRODUCTS

2.01 STORED MATERIALS

- A. Partial payment shall be made for approved materials stored at the project site, provided invoices for said materials are furnished in accordance with payment request submittal and shop drawings for said materials have been approved.

PART 3 – EXECUTION

3.01 LIFT STATION #2 UPGRADES

- A. Pumps and Controls
 - a. Measurement: Measurement for Lift Station 2 Pump and Control Upgrades shall be on a lump sum basis.
 - b. Payment: Payment for Lift Station #2 Upgrades shall be on the basis of percent complete times the lump sum price provided in the BID FORM. Payment shall include all labor, materials, and equipment required for a complete and functional lift station as shown and described in the plans including, but not limited to, replacement of two submersible pumps, new level-based pump control system, new control panel(s), electrical components, and ancillary equipment.
- B. Demolition and Replacement of Hatches
 - a. Measurement: Measurement shall be per each.
 - b. Payment: Payment shall be on the basis of the unit price provided in the bid for each item of work completed including removal/disposal of existing hatch, concrete cutting/prep, and installation of larger hatch for new pump installation.
- C. By-pass Pumping
 - a. Measurement: Measurement shall be on a lump sum basis.
 - b. Payment: Payment shall be on the basis of percent complete times the lump sum price provided in the BID FORM for by-pass pump rental and operation during any time the lift station is required to be down for pump and/or electrical controls replacement.

3.02 LIFT STATION #6 UPGRADES

- A. Pumps and Controls
 - a. Measurement: Measurement for Lift Station #6 Pump and Control Upgrades shall be on a lump sum basis.

- b. Payment: Payment for Lift Station #6 Upgrades shall be on the basis of percent complete times the lump sum price provided in the BID FORM. Payment shall include all labor, materials, and equipment required for a complete and functional lift station as shown and described in the plans including, but not limited to, replacement of two submersible pumps, new level-based pump control system, new control panel, electrical components, and ancillary equipment.

- B. Site Work
 - a. Measurement: Measurement shall be on a lump sum basis.
 - b. Payment: Payment shall be on the basis of percent complete times the lump sum price provided in the BID FORM. Work shall include demolition and replacement of existing fence and gate with extended site footprint. Price shall include concrete pads for new control panel and any additional site work required along proper disposal of all demolished equipment and debris.

- C. By-pass Pumping
 - a. Measurement: Measurement shall be on a lump sum basis.
 - b. Payment: Payment shall be on the basis of percent complete times the lump sum price provided in the BID FORM for by-pass pump rental and operation during the time the lift station is required to be down for pump and/or electrical controls replacement.

- D. Tie-in to existing 4" FM
 - a. Measurement: Measurement shall be on a lump sum basis.
 - b. Payment: Payment shall be on the basis of percent complete times the lump sum price provided in the BID FORM for cutting of existing 4" and tie-in to proposed 6" FM with transition coupling. Price shall also include abandonment and plugging of existing FM termination location in manhole.

- E. Sanitary Sewer Force Main, 6" HDPE – Open Cut
 - a. Measurement: Measurement shall be on a per linear foot basis.
 - b. Payment: Payment shall be on the basis of the unit price provided in the BID FORM for length of pipe installed at various excavation depths between 4 and 10 feet. Payment shall include all costs associated with the selected pipe material. Payment shall include all excavation, trenching, bedding, backfill and compaction, sheeting/shoring, tracer wire, detector tape, material, labor, tools, and testing required.

- F. Sanitary Sewer Force Main, 6" HDPE – Directional Drill
 - a. Measurement: Measurement shall be on a per linear foot basis.
 - b. Payment: Payment shall be on the basis of the unit price provided in the BID FORM for pipe installed by directional drill under wetlands, streams, storm

drains, or roadways as indicated by the plans. Payment shall include all costs associated with the selected pipe material, casing, directional drilling equipment, detection wire, bore/receiving pits, sheeting/shoring, labor, tools, and equipment required for a complete installation.

- G. Sanitary Sewer Force Main, 6" HDPE – Free Bore (may be utilized at contractors' discretion to eliminate the need for concrete, asphalt, and gravel driveway replacements)
 - a. Measurement: Measurement shall be on a per linear foot basis.
 - b. Payment: Payment shall be on the basis of the unit price provided in the BID FORM for pipe installed by free bore under driveways, storm drains, or roadways as indicated by the plans. Payment shall include all costs associated with the selected pipe material, boring equipment, detection wire, bore/receiving pits, sheeting/shoring, labor, tools, and equipment required for a complete installation.

- H. Air Release Valve Assembly
 - a. Measurement: Measurement shall be per each.
 - b. Payment: Payment shall be on the basis of the unit price provided in the bid for each item of work completed including manhole, tapping saddle, air release valve, and miscellaneous piping and accessories for a complete installation.

- I. "Class A Patch" Roadway Removal and Replacement
 - a. Measurement: Measurement shall be on a square yard basis.
 - b. Payment: Payment shall be on the basis of the unit price provided in the BID FORM and shall include the cost of concrete cutting, demolition, new concrete, forms, and all labor, materials, and equipment required to fully and properly install the roadway replacement as shown in the construction details.

- J. Concrete Driveway Removal and Replacement
 - a. Measurement: Measurement shall be on a square yard basis.
 - b. Payment: Payment shall be on the basis of the unit price provided in the BID FORM and shall include the cost of concrete cutting, demolition, new concrete, forms, and all labor, materials, and equipment required to fully and properly install the concrete replacement to the nearest construction joint.

- K. Gravel Driveway Removal and Replacement
 - a. Measurement: Measurement shall be on a square yard basis.
 - b. Payment: Payment shall be on the basis of the unit price provided in the BID FORM and shall include the cost of demolition, all labor, materials, and equipment required to fully and properly restore gravel drive.

3.03 LIFT STATION #26 COMPLETE

- A. Preliminary Exploration
 - a. Measurement: Measurement shall be on a lump sum basis.
 - b. Payment: Payment shall be on the basis of percent complete times the lump sum price provided in the BID FORM. Work shall include excavation of existing gravity and forcemain utilities to confirm location, size, and material for future connections.

- B. Site Work
 - a. Measurement: Measurement shall be on a lump sum basis.
 - b. Payment: Payment shall be on the basis of percent complete times the lump sum price provided in the BID FORM. Work shall include demolition of existing lift station components, site clearing, site grading, fencing, drive and lift station site gravel, and electrical box concrete mounting pad installation. Price shall include proper disposal of all demolished equipment debris.

- C. Wetwell, Pumps, and Controls
 - a. Measurement: Measurement for Lift Station #26 Wetwell, Pumps, and Controls shall be on a lump sum basis.
 - b. Payment: Payment shall be on the basis of percent complete times the lump sum price provided in the BID FORM. Payment shall include all labor, materials, and equipment required for a complete and functional lift station as shown and described in the plans including, but not limited to, a new 5' diameter wetwell, two new submersible pumps, new level-based pump control system, new control panel, electrical components, and ancillary equipment.

- D. Valve Vault and Piping
 - a. Measurement: Measurement shall be on a lump sum basis.
 - b. Payment: Payment shall be on the basis of percent complete times the lump sum price provided in the BID FORM. Payment shall include all labor, materials, and equipment including, but not limited to, precast concrete vault, piping, isolation valves, check valves, air release valve, pressure gauge, and ancillary equipment as shown on the plans.

- E. Doghouse Manhole
 - a. Measurement: Measurement shall be on a lump sum basis.
 - b. Payment: Payment shall be on the basis of percent complete times the lump sum price provided in the BID FORM. Payment shall include all labor, materials, and equipment for installation of a doghouse manhole to re-direct flow to the new LS #26 wetwell. Pricing shall include plugging and abandonment of existing gravity sewer and filling of existing wetwell.

- F. 8" Gravity Main - Open Cut
 - a. Measurement: Measurement shall be on a per linear foot basis.
 - b. Payment: Payment shall be on the basis of the unit price provided in the BID FORM for 8" C-900 gravity main installation as shown on the plans. Payment shall include all costs associated with the selected pipe material, trenching, excavation, sheeting/shoring, backfill, compaction, tracer wire, detector tape, testing, labor, tools, and equipment required for a complete installation.

- G. Sanitary Sewer Force Main, 4" HDPE - Open Cut
 - a. Measurement: Measurement shall be on a per linear foot basis.
 - b. Payment: Payment shall be on the basis of the unit price provided in the BID FORM for new 4" HDPE forcemain including all costs associated with the selected pipe material, trenching, excavation, sheeting/shoring, backfill, compaction, tracer wire, detector tape, testing, labor, tools, and equipment required for a complete installation.

- H. Forcemain Tie-in
 - a. Measurement: Measurement shall be on a lump sum basis.
 - b. Payment: Payment shall be on the basis of percent complete times the lump sum price provided in the BID FORM. Payment shall include all labor, materials, and equipment for tie-in of a new 4" forcemain section to the existing forcemain including, but not limited to, excavation, trenching, sheeting/shoring, transition couplings, and testing. Pricing shall also include plugging and abandonment of existing force main section per the plans.

- I. By-pass Pumping
 - a. Measurement: Measurement shall be on a lump sum basis.
 - b. Payment: Payment shall be on the basis of percent complete times the lump sum price provided in the BID FORM for by-pass pump rental and operation during the time the lift station is required to be down for pump and/or electrical controls replacement.

3.04 EROSION CONTROL

- A. Construction Exit
 - a. Measurement: Measurement shall be per each.
 - b. Payment: Payment shall be on the basis of the unit price provided in the bid for each item of work completed including material, delivery, and installation of rock and underlayment per the construction exit detail found on the plans.

- B. Silt Fence
 - a. Measurement: Measurement shall be on a per linear foot basis.
 - b. Payment: Payment shall be on the basis of the unit price provided in the BID FORM for silt fence including material and installation.

- C. Hay Bale Check Dam
 - a. Measurement: Measurement shall be per each.
 - b. Payment: Payment shall be on the basis of the unit price provided in the bid for each item of work completed including materials and installation.

- D. Grassing
 - a. Measurement: Measurement shall be per each.
 - b. Payment: Payment shall be on the basis of the unit price provided in the bid for each item of work completed including temporary and/or permanent grassing, ground preparation, seeding, watering, fertilization, and reseeding as needed for development of a full stand of grass.

END OF SECTION

SECTION 01050
SURVEYING AND FIELD ENGINEERING

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. Work covered in this Section includes the surveying and field engineering required to complete the project and meet the provisions of this document.

1.02 QUALITY CONTROL

- A. Contractor will employ a Land Surveyor registered in the State of Georgia and acceptable to the Owner/Engineer.

1.03 SUBMITTALS

- A. Submit name, address, telephone number and registration number of surveyor prior to beginning work.
- B. Upon request, submit documentation verifying accuracy of survey work. Documentation may include, but is not limited to, original field notes, worksheets, cutsheets, etc.
- C. Submit at least two sets of prints of “as-constructed” drawings with a surveyor’s certificate verifying that elevations and locations are in conformance with the contract drawings.

PART 2 – PRODUCTS – NOT USED

PART 3 – EXECUTION

3.01 SURVEY REQUIREMENTS

- A. Construction Staking – The Contractor shall provide all construction staking using recognized surveying and engineering practices. The surveyor will locate lines, grades and locations called for in the contract drawings. The Owner will provide a suitable number of benchmarks and monuments for the Contractor to use as a reference.
- B. “As Built Drawings” – Contractor shall maintain record drawings for the project. The final “as constructed” drawings will show the horizontal and vertical location of all storm pipes, boxes, and associated structures. All horizontal locations shall be referenced to the established coordinate systems or to existing streets, roads or

major structures. The Engineer will provide two sets of prints for the Contractor's use in completing this work.

END OF SECTION

**SECTION 01300
SUBMITTALS**

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Submittal Procedures
- B. Construction Progress Schedules
- C. Product Data
- D. Shop Drawings
- E. Samples
- F. Design Data
- G. Test Reports
- H. Certificates
- I. Manufacturer's Instructions
- J. Manufacturer's Field Reports
- K. Erection Drawings

1.02 RELATED SECTIONS – NOT USED

1.03 SUBMITTAL PROCEDURES

- A. Deliver submittals to Engineer in acceptable form, either electronic copy or three (3) hard copies.
- B. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix. Resubmit as specified for initial submittal. Indicate on revised drawings all changes which have been made including those requested by the Engineer.
- C. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate.

- D. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of Products required, field dimensions, adjacent construction work and coordination of information is in accordance with the requirements of the work and Contract Documents. Submittal without the Contractor's stamp will be returned to Contractor without Engineer's review.
- E. Make all submittals far enough in advance of scheduled dates for installation to provide all required time for reviews, for securing necessary approvals, for possible revision and resubmittal, and for placing orders and securing delivery. In scheduling, allow sufficient time for the Engineer's review following the receipt of the submittal. Coordinate submission of related items. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
- F. Identify variations from Contract Documents and Product or system limitations which may be detrimental to successful performance of the completed work.
- G. Provide space for Contractor and Architect/Engineer review stamps.
- H. When revised for resubmission, identify all changes made since previous submission.
- I. Distribute copies of reviewed submittals to concerned parties. Instruct recipients to promptly report any inability to comply with requirements.

1.04 CONSTRUCTION PROGRESS SCHEDULES

- A. Submit initial schedule in triplicate within 15 days after date established in Notice to Proceed.
- B. After reviewed by the Engineer, revise and resubmit as required.
- C. Submit revised schedules with each Application for Payment, identifying changes since previous version.
- D. Submit a computer generated or horizontal bar chart with separate line for each major portion of work or operation, identifying first workday of each week.
- E. Show complete sequence of construction by activity, identifying work of separate stages and other logically grouped activities. Indicate the early and late start, early and late finish, float dates, and duration.
- F. Indicate estimated percentage of completion for each item of work at each submission.

- G. Indicate submittal dates required for shop drawings, product data, samples, and product delivery dates, including those furnished by Owner and required by Allowances.

1.05 PRODUCT DATA

- A. Product Data for Review:
 - 1. Submitted to Engineer for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.
 - 2. After review, provide copies and distribute in accordance with Submittal Procedures article above.
- B. Submit the number of copies which the Contractor requires, plus one (1) copy which will be retained by the Engineer or electronic copy.
- C. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- D. Indicate Product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- E. After review, distribute in accordance with the Submittal Procedures article above.

1.06 SHOP DRAWINGS

- A. Contractor shall submit a minimum of three (3) hard copies or an electronic copy of each shop drawing to the Engineer for review.
- B. Submitted to Engineer for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents. Review of shop drawings by Engineer shall not relieve Contractor of his responsibility for the accuracy of the shop drawings for the furnishing of all materials and equipment required by the contract even though such items may not be indicated on the shop drawings reviewed by Engineer.
- C. Shop drawings shall include applicable technical information, drawings, diagrams, performance curves, schedules, templates, calculations, instructions, measurements, and similar information as applicable to the specific item for which the shop drawing is prepared.

- D. Do not use Engineer's Drawings for shop or erection purposes.
- E. Each shop drawing copy shall bear a Contractor's stamp showing they have been checked. Shop drawings submitted to the Engineer without the Contractor's stamp will be returned to the Contractor without review.
- F. No review will be given to partial submittals of shop drawings for items which interconnect and/or are interdependent. It is the Contractor's responsibility to assemble the shop drawings for all such interconnecting and/or interdependent items, check them and then make one submittal to the Engineer.
- G. Schedule of Submittals – Within 30 days of Contract award and prior to any shop drawing submittal, the Contractor shall submit a schedule showing the estimated submittal date and the desired approval date for each shop drawing anticipated. Time lost due to unacceptable submittals shall be the Contractor's responsibility.

1.07 SAMPLES

- A. Samples for Review -
 - 1. Submitted to Engineer for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.
 - 2. After review, produce duplicates and distribute in accordance with SUBMITTAL PROCEDURES article above.
- B. Samples for Information –
 - 1. Submitted for the Engineer's knowledge as contract administrator or for the Owner.
- C. Include identification on each sample, with full Product information.
- D. Submit the number of samples specified in individual specification sections; one of which will be retained by Engineer.
- E. Review samples which may be used in the Work are indicated in individual specification sections.
- F. Samples will not be used for testing purposes unless specifically stated in the specification section.

1.08 DESIGN DATA

- A. Submit for the Engineer's knowledge as contract administrator or for the Owner.
- B. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.09 TEST REPORTS

- A. Submit for the Engineer's knowledge as contract administrator or for the owner.
- B. Submit test reports for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.10 CERTIFICATES

- A. When specified in individual specification sections, submit certification by the manufacturer, installation/application subcontractor, or the Contractor to Engineer, in quantities specified for product Data.
- B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or Product, but must be acceptable to Engineer.

1.11 MANUFACTURER'S INSTRUCTION

- A. When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, to Engineer for delivery to Owner in quantities specified for Product Data.
- B. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.12 MANUFACTURER'S FIELD REPORTS

- A. Submit reports for the Engineer's benefit as contract administrator or for the Owner.
- B. Submit report in duplicate within 15 days of observation to Engineer for information.

- C. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.13 ERECTION DRAWINGS

- A. Submit drawings for the Engineer's benefit as contract administrator or for the Owner.
- B. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.
- C. Data indicating inappropriate or unacceptable work may be subject to action by the Engineer or Owner.

1.14 REVIEWED SHOP DRAWINGS

- A. Engineer Review
 - 3. Acceptable submittals will be marked "Approved." A minimum of one (1) copy will be retained by the Engineer for Engineer's and the Owner's use and the remaining copies will be returned to the Contractor.
 - 4. Submittals requiring minor corrections before the product is acceptable will be marked "Furnish as Corrected." The Contractor may order, fabricate and shop the items included in the submittals provided the indicated corrections are made.
 - 5. Submittals marked "Revise and Submit" must be revised to reflect required changes and the initial review procedure repeated.
 - 6. The "Rejected" notation is used to indicate products which are not acceptable. Upon return of a submittal so marked, the Contractor shall repeat the initial review procedure utilizing acceptable products.
 - 7. Only two copies of items marked "Revise and Submit" and "Rejected" will be reviewed and marked. One copy will be retained by the Engineer and the other copy with all remaining unmarked copies will be returned to the Contractor for resubmittal.
- B. No work or products shall be installed without a drawing or submittal bearing the "Approved" or "Furnish as Corrected" notation. The Contractor shall maintain at the job site a complete set of shop drawings bearing the Engineer's stamp.

- C. Substitutions – In the event the Contractor obtains the Engineer’s approval for the use of products other than those which are listed first in the Contract Documents, the Contractor shall, at the Contractor’s own expense and using methods approved by the Engineer, make any changes to structures, piping and electrical work that may be necessary to accommodate these products.

- D. Use of the “Approved” or “Furnish as Corrected” notation on shop drawings or other submittals is general and shall not relieve the Contractor of the responsibility of furnishing products of the proper dimension, size, quality, quantity, materials, and all performance characteristics, to efficiently perform the requirements and intent of the Contract Documents. The Engineer’s review shall not relieve the Contractor of the responsibility of errors of any kind on the shop drawings. Review is intended only to assure conformance with the design concept of the Project and compliance with the information given in the Contract Documents.

PART 2 – PRODUCTS: - NOT USED

PART 3 – EXECUTION: - NOT USED

END OF SECTION

**SECTION 01410
TESTING SERVICES**

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Selection and Payment
- B. Contractor Submittals
- C. Testing Agency Responsibilities
- D. Testing Agency Reports
- E. Limits on Testing Authority
- F. Contractor Responsibilities
- G. Schedule of Tests

1.02 RELATED SECTIONS

- A. Testing and approvals required by public authorities.
- B. Section 01300 – Submittals – Manufacturer’s Certificates.
- C. Section 01701 – Contract Closeout – Project Record Documents.

1.03 REFERENCES

- A. ASTM C 802-87 – Practice for Conducting an Interlaboratory Test Program to Determine the Precision of Test Methods for Construction.
- B. ASTM C 1077-92 – Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation.
- C. ASTM C 1093-88 – Practice for Accreditation of Testing Agencies for Unit Masonry.
- D. ASTM D 290-85 – recommended Practice for Bituminous Mixing Plant Inspection.
- E. ASTM D 3740-92 – Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

- F. ASTM D 4561-86 – Practice for Quality Control Systems for an Inspection and Testing Agency for Bituminous Paving Materials.
- G. ASTM E 329-93 – Practice for Use in the Evaluation of Inspection and Testing Agencies as Used in Construction.
- H. ASTM E 543-93 – Practice for Determining the Qualification of Nondestructive Testing Agencies.
- I. ASTM E 548-93 – Practice for Preparation of Criteria for Use in the Evaluation of Testing Laboratories and Inspection Bodies.
- J. ASTM E 699-79 (Reapproved 1991) – Practice for Criteria for Evaluation of Agencies Involved in Testing, Quality Assurance, and Evaluating Building Components in Accordance with Test Methods Promulgated by ASTM Committee E6.

1.04 SELECTION AND PAYMENT

- A. Contractor shall select, and Owner shall approved, a Testing Firm for Contractor to use and employ.
- B. Contractor shall be responsible for contracting the services of the approved independent testing agency or laboratory to perform specified testing. All coordination of testing and payment for services shall be the responsibility of the Contractor.
- C. Employment of testing agency or laboratory in no way relieves Contractor of obligation to perform work in accordance with requirements of Contract Documents.

1.05 QUALITY ASSURANCE

- A. Comply with requirements of practices listed in paragraph 1.3.
- B. Laboratory – Authorized to operate in State in which Project is located.
- C. Laboratory Staff – Maintain a full time registered Engineer on staff to review services.
- D. Testing Equipment – Calibrated at reasonable intervals with devices of an accuracy traceable to either National Bureau of Standards or accepted values of natural

physical constants.

1.06 CONTRACTOR SUBMITTALS

- A. Prior to start of Work, submit list of preferred testing laboratory name, address, and telephone number, and names of full time registered Engineer and responsible officer. Owner may select a firm from list or may request different firm for use in testing.
- B. Submit copy of report of laboratory facilities inspection made by Materials Reference Laboratory of National Bureau of Standards during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.

1.07 TESTING AGENCY RESPONSIBILITIES

- A. Test samples of mixes submitted by Contractor.
- B. Provide qualified personnel at site. Cooperate with Engineer and Contractor in performance of services.
- C. Perform specified sampling and testing of Products in accordance with specified standards.
- D. Ascertain compliance of materials and mixes with requirements of Contract Documents.
- E. Promptly notify Engineer and Contractor of observed irregularities or non-conformance of Work or Products.
- F. Perform additional tests required by Engineer.
- G. Attend Preconstruction meetings and progress meetings.

1.08 TESTING AGENCY REPORTS

- A. After each test, promptly submit three (3) copies of report to Engineer and to Contractor.
- B. Include –
 - 1. Date issued

2. Project title and number
 3. Name of inspector
 4. Date and time of sampling or inspection
 5. Identification of product and specifications section
 6. Location in the Project
 7. Type of inspection or test
 8. Date of test
 9. Results of tests
 10. Conformance with Contract Documents
- C. When requested by Engineer, provide interpretation of test results.

1.09 LIMITS ON TESTING AUTHORITY

- A. Agency or laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
- B. Agency or laboratory may not approve or accept any portion of the Work.
- C. Agency or laboratory may not assume any duties of Contractor.
- D. Agency or laboratory has no authority to stop the Work.

1.10 CONTRACTOR RESPONSIBILITIES

- A. Deliver to agency or laboratory at designated location, adequate samples of materials proposed to be used which require testing, along with proposed mix designs.
- B. Cooperate with laboratory personnel, and provide access to the Work.
- C. Provide incidental labor and facilities –
 1. To provide access to work to be tested
 2. To obtain and handle samples at the site or at source of Products to be

tested

3. To facilitate tests
 4. To provide storage and curing of test samples
- D. Notify Engineer and laboratory 48 hours prior to expected time for operations requiring testing services.
- E. Employ services of an independent qualified testing laboratory.

1.11 SCHEDULE OF TESTS

Section	Test *	Frequency *	Date	Performed By	Notes
02300 – Earthwork					
	Compaction				
	Unpaved & Landscaped with no traffic	1 test per horizontal layer per 10,000 sf of fill area			
	Paved & Pond Levee	1 test per horizontal layer per 5,000 sf of area			
	Building Pad	1 test per horizontal layer per 1,500 sf of fill area			
	Curb & Gutter	1 test per 300 lf			
	Proof Rolling	As necessary			
02510 – Water Distribution System					
	Hydrostatic & Leakage	1.5 times the working pressure (no less than 150 psi). Conducted for 2 hours with maintained pressure of 150 psi (200 psi on fire main)			
	Bacteriological Samples	2 taken 24 hours apart after disinfection			
	Compaction				
	Traffic Areas	1 per 100 lf or less for each 4 ft. of depth			
	Non-Traffic Areas	1 per 500 lf or less for each 4 ft. of depth			
	Fire Flow	1 per permit			
02530 – Wastewater Collection System					
	Start-up	Prior to acceptance of Pump Station			
	Drawdown	Prior to acceptance of Pump Station			
* Unless specified otherwise in individual Sections.					
	Certification	Completion			
	Warranty	Completion			
	Television Inspection of Sewers	As requested			
	Leakage	As necessary			

Section	Test *	Frequency *	Date	Performed By	Notes
	Compaction				
		Traffic Areas	1 per 100 lf or less for each 4 ft. of depth		
		Non-Traffic Areas	1 per 500 lf or less for each 6 ft. of depth		
	Gravity – Air		[All lines]		
	Gravity Vacuum		All manholes		
	Hydrostatic – Force Main		100 psi for 2 hours		
	Deflection		10% of system		
02630 – Storm Drainage					
	Compaction				
		Traffic Areas	1 per 100 lf or less for each 4 ft. of depth		
		Non-Traffic Areas	1 per 500 lf or less for each 6 ft. of depth		
02720 – Aggregate Base Course					
	Base Density		1 test per 5,000 sf		
02740GA – Asphaltic Concrete Base Course					
	Asphalt Extraction & Gradation		1 test per each 250 tons placed		
	Marshall Stability		1 test per each 250 tons placed		
	Core		1 test for each 250 tons placed		
	Field Density		1 test per 5,000 sf		
02740GA – Asphaltic Concrete Binder/Surface Courses					
	Asphalt Extraction & Gradation		1 test for each 250 tons placed		
	Marshall Stability		1 test for each 250 tons placed		
	Core		1 test for each 250 tons placed		
	Field Density		1 test per 5,000 sf		
02750 – Portland Cement concrete Paving					
* Unless specified otherwise in individual Sections.					
	Mix Designs		1 per mix design		
	Compressive Strength		3 test cylinders for every 30 cubic yards or less of each mix design placed daily		
			1 cylinder broken at 7 days		
			2 cylinders broken at 28 days		
	Slump		1 test for each set of cylinders taken		
03300 – Cast-in-Place Concrete					
	Materials		As necessary		
	Mix Designs		1 per mix design		
	Strength		5 test cylinders for each 50 cy or less of each mix design placed daily (min. of 5 cylinders for each days pour of less than 50 cy)		
			1 cylinder tested at 7 days		
			1 cylinder tested at 14 days		
			2 cylinders tested at 28 days		
			1 cylinder tested at 56 days		
	Slump		1 test per each set of cylinders		

Section	Test *	Frequency *	Date	Performed By	Notes
	Air Content	1 test per each set of cylinders			
	Temperature	1 test per each set of cylinders			

PART 2 – PRODUCTS – Not Used

PART 3 – EXECUTION

3.1.1 Payment

The Contractor shall make payment to Owner selected Testing Firm for all work as described above. Contractor shall include cost of required testing in with the bid item to which it pertains in the Bid Form. Any additional testing required due to failed tests shall be made at the cost of the Contractor. Any other additional testing desired by the Owner or Engineer will be paid for separately under the allowance lump sum described in Technical Specification 01020.

END OF SECTION

SECTION 01516
TEMPORARY SANITARY FACILITIES

PART 1 GENERAL

1.01 SCOPE

- A. This section is intended to include requirements for temporary sanitary facilities provided by Contractor, including provisions for Contractor's use of existing and permanent facilities.

1.02 REQUIREMENTS INCLUDED

- A. Temporary Sanitary Facilities
- B. Maintenance and Service
- C. Removal
- D. Cleaning

1.03 USE OF EXISTING FACILITIES

- A. Use of the Owner's existing or new facilities is prohibited. The Contractor will be required to provide their own portable facilities.

1.04 USE OF PORTABLE FACILITIES

- A. Contractor shall provide portable sanitary facilities at such places as approved by the Owner.
- B. Contractor shall pay all costs for installation, maintenance, and removal of temporary sanitary facilities.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Materials may be new or used, adequate to the purpose, which will not create unsanitary conditions.

2.02 TOILET FACILITIES

- A. Enclosed portable self-contained units or temporary water closets and urinals,

secluded from public view.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Provide facilities at time of site mobilization.
- B. Modify and extend service as work progresses.

3.02 MAINTENANCE AND SERVICE

- A. Clean areas of facilities weekly and maintain in a sanitary condition.
- B. Provide toilet paper, paper towels, and soap in suitable dispensers.

3.03 REMOVAL

- A. Remove portable units when other facilities are available or prior to Substantial Completion.

END OF SECTION

**SECTION 01560
ENVIRONMENTAL CONTROLS**

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Contractor shall furnish all material and labor for the installation and maintenance of the environmental control measures throughout the project.

1.02 SITE MAINTENANCE

- A. The Contractor shall keep the work site clean and free from rubbish and debris. Materials and equipment shall be removed from the site when they are no longer necessary. Upon completion of the work and before final acceptance, the work site(s) shall be cleared of equipment, unused materials, and rubbish to present a clean and neat appearance.

1.03 TEMPORARY DAMS

- A. Except in time of emergency, earth dams are not acceptable at catch basin openings, local depressions, or elsewhere. Temporary dams of sandbags, asphaltic concrete, or other acceptable material will be permitted when necessary to protect the work, provided their use does not create a hazard or nuisance to the public. Such dams shall be removed from the site as soon as they are no longer necessary.
- B. Dams shall not interfere with the existing storm drainage system.

1.04 AIR POLLUTION CONTROL

- A. The Contractor shall not discharge smoke, dust, and other contaminants into the atmosphere that violate the regulations of any legally constituted authority. The Contractor shall also abate dust nuisance by cleaning, sweeping, and sprinkling with water, or other means as necessary. The use of water, in amounts which result in mud on public streets, is not acceptable as a substitute for sweeping or other methods.

1.05 NOISE CONTROL

- A. Between 7:30 PM and 7:00 AM, noise from Contractor's operations shall not exceed limits established by applicable laws or regulations and in no event shall exceed 86 dBA at a distance of 50 feet from the noise source.

1.06 EROSION CONTROL

- A. All points of concentrated runoff from rainfall shall be visually monitored to determine that no eroded material from the construction site is being deposited in the adjacent ditches, lakes and streams. Measures shall be taken to promptly eliminate such a deposition if occurring, including the installation of detention ponds.
- B. Comply with all applicable requirements of Section 02370 – Soil Erosion and Sediment Control of these Specifications.

PART 2 PRODUCTS: - NOT USED

PART 3 EXECUTION: - NOT USED

END OF SECTION

**SECTION 01701
CONTRACT CLOSEOUT PROCEDURES**

PART 1 – GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Administrative provisions for Substantial Completion and for final acceptance.

1.02 RELATED REQUIREMENTS

- A. Section 01300 – Submittal
- B. Section 01720 – Record Documents
- C. Section 01740 – Warranties and Bonds

1.03 SUBSTANTIAL COMPLETION

- A. When the Contractor considers the work substantially complete, he shall prepare a punch list of uncompleted items and send to the Engineer for review. At the same time, the Contractor shall request in writing that the Engineer schedules a pre-final inspection.
- B. The Engineer will review the punch list submitted by the Contractor and determine if the project is substantially complete.
- C. If the Engineer determines that the project is not substantially complete, he will notify the Contractor in writing which items need to be finished before the project can be considered substantially complete. The Contractor shall continue working to complete all punch list items and resubmit a revised punch list when he considers the work is substantially complete.
- D. When the Engineer determines that the work is substantially complete, he will schedule a pre-final inspection with the Owner, Contractor and Engineer. A final punch list will be prepared at this time.
- E. After all punch list items have been completed, the Contractor shall send a request in writing to the Engineer to schedule a final inspection. When all punch list items are complete, the Engineer will issue a certificate of substantial completion.

1.04 FINAL COMPLETION

- A. When the Contractor considers that all of the work is complete, he shall submit the following certificates:
 - 1. All work has been completed and inspected for compliance with the Contract Documents and all deficiencies listed with the certificate of substantial completion have been corrected.
 - 2. All equipment and systems have been tested, adjusted and are fully operational.
 - 3. Owner's personnel have been fully instructed in the operation of all equipment (include sign off for each system).
 - 4. Work is complete and ready for final inspection.
- B. Should Engineer's inspection find work incomplete, he will promptly notify Contractor in writing listing observed deficiencies.
- C. Contractor shall remedy deficiencies and send a request for another final inspection.
- D. When Engineer finds work is complete, he will process final pay request documents.

1.05 CLOSEOUT SUBMITTALS

- A. Evidence of Compliance with Requirements of Governing Authorities –
 - 1. Certificate of Occupancy as required by local codes.
 - 2. Certificates of Inspection approvals required for plumbing, mechanical and electrical systems as required by local codes if applicable.
- B. Project Record Documents – Under provisions of Section 01720.
- C. Warranties and Bonds – Under provisions of Section 01740.
- D. Keys and Keying Schedule.
- E. Evidence of Payment and Release of Liens – In accordance with Conditions of the Contract.
- F. Consent of Surety to Final Payment – Consent of Surety is to be sent by Surety directly to ESG Engineering to the attention of the Project Engineer.

1.06 APPLICATION FOR FINAL PAYMENT

- A. Prior to application for final payment, the Contractor shall give the Engineer a list of all additions or deletions not previously approved by change order.
- B. The Engineer will review this list and prepare a final closeout change order for the items that are justified by the terms of the contract or approved by field order.
- C. After approval of the final closeout change order the Contractor may submit his application for final payment.

PART 2 – PRODUCTS: Not Used.

PART 3 – EXECUTION: Not Used.

END OF SECTION

**SECTION 01710
FINAL CLEAN-UP**

PART 1 – GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Final clean-up of site, roadway and buildings.

1.02 DESCRIPTION

- A. Execute clean-up prior to inspection for Substantial Completion of the Work.

1.03 DISPOSAL REQUIREMENTS

- A. Remove and dispose of waste materials, rubbish, debris and trash in compliance with provisions of governing laws, codes, ordinances and regulations.
 - 1. Do not burn or bury rubbish, trash, debris and waste materials on Project site.

PART 2 – PRODUCTS

2.01 CLEANING MATERIALS

- A. Use materials which will not create hazards to health or property, and which will not damage surfaces.
- B. Use only materials and methods recommended by manufacturer of material being cleaned.

PART 3 – EXECUTION

3.01 PERIODIC CLEANING

- A. On a regular and frequent basis during progress of work, perform cleaning necessary to keep Project site and adjacent properties free from unsightly and unsafe accumulation of scrap and waste materials, debris, rubbish and trash resulting from construction operations.
 - 1. Provide sufficient trash bins and containers for collection of scrap and

waste material, debris, rubbish and trash.

2. Provide separate, closeable top metal containers for collection of oil and paint soaked rags; empty volatile substance cans and other waste products subject to spontaneous combustion.
 3. Designate approved eating areas and provide covered containers conforming to local health codes for collection of waste paper and leftover foodstuffs. Enforce usage of containers by workmen.
- B. Dispose of scrap and waste materials, debris, rubbish and trash by one of the following optional methods –
1. Provide services of company regularly engaged in refuse disposal operations, including usage of large metal dump-type trash containers.
 2. Use own forces and equipment for loading, hauling and disposal.
- C. Remove accumulations of scrap and waste materials as bins and containers are filled and not less than once per week.
1. Remove containers containing products subject to spontaneous combustion daily.
 2. Remove containers containing waste paper and leftover foodstuff daily.
 3. Legally dispose of all waste materials, rubbish, volatile materials and cleaning materials off Project site.
 4. Dispose of no materials in waterways.

3.02 DUST CONTROL

- A. Site Work – When working on unpaved or disturbed paved streets, Contractor shall maintain a water truck on site for dust control. All dusty work sites in residential areas shall be watered at least twice per day and whenever directed by the Owner’s representative.
- B. During application of finished surface materials, including painting and decorating, employ dust control methods during cleaning operations to prevent dust from contaminating wet and freshly coated surfaces.

3.03 FINAL CLEANING

A. Site Work

1. All piles of dirt and rocks are to be removed from the work areas.
2. All disturbed areas are to be grassed and mulched according to these specifications.
3. All construction debris is to be removed to an approved disposal site.
4. All streets are to be swept with a mechanical sweeper.

B. Buildings

1. All construction debris shall be removed from the building and disposed of at an approved disposal site.
2. Remove labels, tags, stickers and unauthorized identification markings from finished surfaces.
 - (a) Do not remove permanently affixed nameplates, instructions, markings, Underwriters Laboratories Labels and approval stickers, Factory Mutual approved stickers and other identifying markings required by federal, state and local codes, ordinances and regulations.
3. Remove temporary protective coatings, tapes and films from finished aluminum surfaces and ornamental metal surfaces, clean and polish aluminum and ornamental metal in compliance with manufacturer's instructions.
4. Sweep concrete floors not less than broom clean; vacuum where necessary to remove excessive dust; thoroughly clean other hard surfaced floors.
 - (a) Remove mortar droppings, joint compound, plaster and cementitious material droppings from floors prior to final cleaning.
 - (b) Concrete floors of process areas shall be rinsed with water and broomed and allowed to dry before final inspection.

3.04 INSPECTION

- A. Prior to occupancy by Owner of any designated portion of Work, conduct inspection in presence of Owner to verify work is properly clean and ready for acceptance by Owner.

END OF SECTION

**SECTION 01720
PROJECT RECORD DOCUMENTS**

PART 1 – GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Maintenance of Record Documents and Samples.
- B. Submittal of Record Documents and Samples.

1.02 MAINTENANCE OF DOCUMENTS AND SAMPLES

- A. In addition to requirements in General Conditions, Maintain for Owner, two record copies of:
 - 1. Contract Drawings
 - 2. Specifications
 - 3. Addenda
 - 4. Approved Change Orders, field orders or other modifications to the Contract
 - 5. Approved shop drawings, product data, and samples
 - 6. Field test records
 - 7. Inspection Certificates
 - 8. Manufacturer's certificates
- B. Records and samples should be stored in a clean dry area with easy access.
- C. Document Files –
 - 1. Contract Drawings shall be maintained.
 - 2. Specifications, addenda and Change Orders shall be filed in a "Banker Box" type file with hanging file folders.
 - 3. Shop drawings shall be filed in "Banker Box" hanging file with a separate file folder for each item. The Contractor shall maintain an index of shop

drawings in the first folder. Each folder shall be labeled with the name of the item and the specifications and/or drawing number.

4. Field tests and inspection certificates shall be maintained in separate file folders.
 5. All labels or indexes shall be typed or printed.
- D. Maintain Record Documents in a clean, dry and legible condition. Do not use Record Documents for construction purposes.
- E. Storing documents electronically is also permissible so long as they are kept organized in appropriately labeled separate file folders.
- F. Keep Record Documents and samples available for inspection by Engineer.

1.03 RECORDING

- A. Record information on clean sets of drawings and contract specifications. Label each sheet of the Project Record Drawings in the lower right corner with the neatly printed words "*PROJECT RECORD DRAWINGS.*"
1. Two (2) sets of Contract Documents and Drawings will remain clean without mark-up for record purposes. Contractor shall use an additional set for marking measurements, on-site changes, items of construction that are actually used, and other conditions as they are encountered during the course of the Work. This marked-up set of Contract Documents and Drawings shall consist of red-lined copies of plans and shop drawings, shall indicate actual field dimensions, shall represent the work as actually constructed, and shall be recorded on a daily basis. Failure to produce these records on request of Engineer or Owner shall constitute grounds to halt construction with no time extension until steps are taken to see that these records are being properly made. Record Drawings shall be inspected by Engineer at all project meetings and during all site inspections.
- B. Provide colored pens or pencils for marking each description of work.
1. The Contractor shall provide colored pencils for marking record copies of Contract Drawings and Specifications. Use a different colored pencil for each of the following:

(Example)

(a)	Architectural Work	Red
(b)	Plumbing work	Green
(c)	HVAC Work	Blue
(d)	Electrical Work	Orange
(e)	Other written notations	Brown

2. Establish a color code denoting what trade will use what color, and show this on a schedule on the front sheet of the 'PROJECT RECORD DOCUMENTS'.
- C. Record information concurrently with construction progress. **DO NOT CONCEAL ANY WORK UNTIL REQUIRED INFORMATION IS RECORDED.**
- D. Contract Drawings and Shop Drawings – Legibly mark each item to record actual construction, including:
1. Measured depths of elements of foundation in relation to finish first floor or benchmark.
 2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements. Use stations and offsets or coordinates.
 3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of construction.
 4. Field changes of dimension and detail.
 5. Changes made by Modifications.
 6. Details not on original Contract Drawings.
 7. References to related shop drawings and Modifications.
- E. Prior to final construction inspection, Contractor shall furnish to Engineer two (2) neatly marked sets of construction plans which accurately depict the conditions and records all changes made during construction. Engineer shall promptly notify Contractor in writing if additional information is required. (Electronic copies of construction plans may also be accepted.)
- F. Other Documents – Maintain manufacturer's certifications, inspection

certifications, and field test records, required by individual Specification sections.

END OF SECTION

**SECTION 01740
WARRANTIES AND BONDS**

PART 1 - GENERAL

1.01 PROJECT MAINTENANCE AND WARRANTY

- A. Maintain and keep in good repair the Work covered by these Drawings and Specifications until acceptance by the Owner.
- B. The Contractor shall warrant for a period of one year from the date of Owner's written final acceptance of the Project, that the completed Work is free from all defects due to faulty products or workmanship and the Contractor shall promptly make such corrections as may be necessary by reason of such defects. The Owner will give notice of observed defects with reasonable promptness. In the event that the Contractor should fail to make such repairs, adjustments or other work that may be made necessary by such defects, the Owner may do so and charge the Contractor the cost thereby incurred. The Performance Bond shall remain in full force and effect throughout the warranty period.
- 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 multiple failures of major consequences 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 design, workmanship, and materials shall commence on the day that the item is reassembled and placed back into operation. As used herein, multiple failure shall be interpreted to mean two or more successive failures of the same kind in the same item or failures of the same kind in two or more items. Major 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 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 in a given item, all products of the same size and type shall be disassembled, inspected, modified or replaced as necessary and rewarranted for one year.

- E. The Contractor shall, at Contractor's own expense, furnish all labor, materials, tools and equipment required and shall make such repairs and removals and 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 the Contractor. 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 final acceptance. 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 upon notification 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 Contractor's 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 Contractor's 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 within the law of the place of construction.

END OF SECTION

SECTION 02315
EXCAVATION, TRENCHING AND BACKFILL FOR UTILITY SYSTEMS

PART 1 – GENERAL

1.01 SCOPE

- A. Furnish all labor, materials, equipment and incidentals necessary to perform all excavation, trenching and back fill required to complete the work shown on the Drawings and specified herein. The work shall include, but is not limited to; excavation for manholes, wetwells, vaults, electrical manholes, hand holes, conduits, cables, raceways and ducts and pipes; all backfilling, embankment and grading; disposal of waste and surplus materials; and all related work such as sheeting, bracing and dewatering.
- B. Loam, if any, excavated under this Section may be salvaged by the Contractor for his own convenience for use as specified under Section 02920.
- C. Obtain materials required for backfill, fill, or embankments in excess of that available on the site from other sources. Include all costs of obtaining off-site materials in the contract price.

1.02 RELATED WORK

- A. Section 02920 – Permanent (Perennial) Grassing and Landscaping

1.03 REFERENCES

- A. American Society for Testing and Materials.

1.04 TESTING SERVICES

- A. The Contractor shall obtain the service of a certified testing service to perform all compaction tests specified herein. The cost of these services shall be at Contractor's expense.
- B. Soil testing shall be performed by an accredited testing laboratory selected by the Contractor and approved by the Owner. Tests shall be performed in accordance with applicable ASTM or AASHTO standard methods, unless otherwise specified.
- C. All materials to be used in the work shall be tested prior to the use to show conformance with the requirements of these specifications. Test reports shall

be delivered to the Engineer in duplicate prior to use of any material in the work.

- D. Materials being used in the work, which have been tested previously, may be subjected to further tests from time to time and may be rejected if found defective. Rejected materials shall be removed from the project immediately, notwithstanding the results of former tests to which they have been subjected.
- E. Soil tests shall be performed on subgrades prior to the placement of fill or backfill materials. Tests shall also be performed immediately after the placement of each layer of fill or backfill materials to show conformance with the field density and optimum moisture requirements of these specifications. No additional layers shall be placed until the density of each layer has been approved.
- F. If the Engineer determines, based on tests reports and inspections, that subgrades or layers which have been placed are below the specified density, the Contractor shall provide additional compaction and testing at no additional expense to the Owner.

1.05 PROTECTION

- A. Sheeting and Bracing (also see Section 02350)
 - 1. Furnish, put in place, and maintain such sheeting and bracing as may be required to support the sides of excavations, to prevent any movement which could in any way diminish the ridge of the excavation below that necessary for proper construction, and to protect adjacent structures from undermining or other damage. If the Engineer is of the opinion that at any points sufficient or proper supports have not been provided, he may order additional supports put in at the expense of the Contractor, and compliance with such order shall not relieve or release the Contractor from his responsibility for the sufficiency of such supports. Care shall be taken to prevent voids outside of the sheeting, but if voids are formed, they shall be immediately filled and rammed. Where soil cannot be properly compacted to fill a void, lean concrete shall be used as backfill at no additional expense to the Owner. Sheeting and Bracing requirements are further defined in OSHA Standards, Subpart P, Part 1926 of the Code of Federal Regulations.
 - 2. The Contractor shall construct the sheeting outside the neat lines of the foundation unless indicated otherwise to the extent he deems it desirable for his method of operation. Sheeting shall be plumb and securely braced and tied in position. Sheeting and bracing shall be

adequate to withstand all pressures to which the trench will be subjected. Any movement or bulging which may occur shall be corrected by the Contractor at his own expense so as to provide the necessary clearances and dimensions.

3. Where sheeting and bracing is required to support the sides of excavations, the Contractor shall engage a Professional Engineer, registered in the State of Georgia, to design the sheeting and bracing. Design drawing, specifications, and calculations shall be provided as part of the submittal process. The sheeting and bracing installed shall be in conformity with the design, and certification of this shall be provided by the Professional Engineer.
4. The Contractor shall leave in place to be embedded in the backfill all sheeting and bracing not shown on the Drawings but which the Engineer may direct him in writing to leave in place at any time during the progress of the work for the purpose of preventing injury to structures, utilities, or property, whether public or private. The Engineer may direct that timber used for sheeting and bracing be cut off at any specified elevation. The contractor will be paid for such sheeting directed by the Engineer to be left in place in accordance with the General Conditions. All timber sheeting to be left in place shall be treated.
5. All sheeting and bracing not left in place shall be carefully removed in such manner as not to disturb utilities, or property. All voids left or caused by withdrawal of sheeting shall be immediately refilled with sand by ramming with tools especially adapted to that purpose, or otherwise as acceptable to Engineer and Owner.
6. The right of the Engineer to order sheeting and bracing left in place shall not be construed as creating any obligation on his part to issue such orders, and his failure to exercise his right to do so shall not relieve the Contractor from liability for damages to persons or property occurring from or upon the work on the part of the Contractor to leave in place sufficient sheeting and bracing to prevent any caving or moving of the ground.
7. No sheeting is to be withdrawn if driven below mid-diameter of any pipe, and under no circumstances shall any sheeting be cut off at a level lower than 1 ft above the top of any pipe. The cost of said sheeting shall be part of the base bid.

B. Dewatering and Drainage

1. The Contractor shall, at all times during construction, provide and maintain proper equipment and facilities to remove all water entering excavations, and shall keep such excavations dry so as to obtain a satisfactory undisturbed subgrade foundation condition until the fills, structures or pipes to be built thereon have been completed to such extent that they will not be floated or otherwise damaged by allowing water levels to return to natural levels. The Contractor shall engage a Geotechnical Engineer, Registered in the State of Georgia, to design the dewatering system. The Contractor shall submit to the Engineer for review the design of the dewatering systems prior to commencing work. Design drawings, specifications, and calculations shall be provided as part of the submittal process.
2. The Contractor shall furnish, install, maintain, operate and remove a temporary dewatering system consisting of trenches, sump pits, deep wells, well points, or other methods as required to lower and control the groundwater level so that the pipes may be installed in the dry. The Contractor shall assume full responsibility for the design and installation of an adequate dewatering system. The Contractor shall, at his own expense, correct all damage resulting from inadequacy of the dewatering system or from flooding of the construction site from other causes.
3. The Contractor shall maintain the water level below the excavated area for the various phases of the work continuously and shall make such provisions as may be necessary to avoid interruptions due to weather, labor strikes, power failures, or other delays. He shall provide and have ready for immediate use at all times diesel or gasoline powered standby pumping units to serve the system in case of failure of the normal pumping units.
4. Piping and boiling, or any form of uncontrolled seepage, in the bottom or sides of the excavation shall be prevented at all times. If for any reason the dewatering system is found to be inadequate to meet the requirements set forth herein, the Contractor shall at his own expense make such additions, changes and/or replacements as necessary to provide a satisfactory dewatering system.
5. Dewatering shall at all times be conducted in such a manner as to preserve the undisturbed bearing capacity of the subgrade soils at proposed bottom of excavation. Well or sump installations shall be constructed with proper sand filters to prevent drawing of finer grained soil from the surrounding ground.
6. Water entering the excavation from surface runoff shall be collected in

shallow ditches around the perimeter of the excavation, drained to sumps, and pumped from the excavation to maintain a bottom free from standing water.

7. The Contractor shall take all additional precautions to prevent uplift during construction. The Contractor shall maintain the groundwater level below the pipe or structure so flotation is prevented.
8. Drainage water shall be disposed of through a desilting basin which will prevent the discharge of sediment into any surface waters or existing drains, and to prevent flow or seepage back into the excavated area.
9. Flotation shall be prevented by the Contractor by maintaining a positive and continuous operation of the dewatering system. The Contractor shall be fully responsible and liable for all damages which may result from failure of this system.
10. Removal of dewatering equipment shall be required; the material and equipment constituting the system, shall be removed by the Contractor.
11. The Contractor shall take all necessary precautions to preclude the accidental discharge of fuel, oil, etc. in order to prevent adverse effects on groundwater quality.

C. Culverts and Ditches

1. Protect drainage culverts from damage. If damaged, restore to satisfactory condition at no cost to the Owner.
2. If it is necessary to remove a culvert, do not replace until the proposed pipeline is installed and trench backfilled and compacted to the subgrade of the culvert. Replace culverts to the line and grade established by the Owner.
3. Backfill minor drainage ditches so that the upper one foot of material between ditch banks is topsoil, loam, or clay.
4. Compact this material for the full ditch width to a minimum of 95% of maximum density as determined by ASTM D 1557.
5. Ditches steeper than 2:1 slope shall be protected and reinforced with a synthetic fiber or grid material. Contractor has the option not to use reinforcement for slopes 2:1 or flatter. Correct any ditch erosion occurring as a result of pipeline construction at no cost to the Owner.

D. Water, Gas, Telephone, Power, Cable

12. Protect all other utilities from damage. Notify utility owner prior to start of excavation as directed in sub-paragraph 3-5-2 of the General Conditions. If, during the work the utility is damaged, notify the utility company and the Owner immediately. Do not attempt to repair or replace damaged utilities unless so directed by the utility company and approved by the Engineer. Payment for restoration of damaged utilities shall be the Contractor's responsibility. Call before you dig – Utilities Protection Center 1-800-282-7411.

1.06 JOB CONDITIONS

A. Soils

1. The contractor shall examine the site and review the available test borings or undertake his own soil borings prior to submitting his bid, taking into consideration all conditions that may affect his work. The Owner and Engineer will not assume responsibility for variations of subsoil quality or conditions at locations other than places shown and at the time the investigation was made. The Contractor shall accept the site in its existing condition, and shall assume the risk of encountering whatever materials as may occur. The soil borings furnished are indicative of the soils encountered at the particular location of the borings at the time the borings were taken. The Contractor shall make his own determination of the soil structure and site conditions as it may affect the work.

B. Existing Utilities

1. Locate existing underground utilities in the areas of work. If utilities are to remain in place, provide adequate means of protection during earthwork operations.
2. Should uncharted, or incorrectly charted, piping appear in the excavation, consult the Engineer and the Owner of such piping or utility immediately for directions.
3. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.
4. Demolish and completely remove from site existing underground utilities indicated on the Drawings to be removed.

C. Protection of Persons and Property

1. Barricade open excavations occurring as part of this work and post with warning lights. Operate warning lights as recommended by authorities having jurisdiction.
2. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

1.07 SUBMITTALS

- A. Submit to the Engineer for review in accordance with Section 01300 the proposed methods of construction, including dewatering, excavation, filling, compaction, and backfilling for the various portions of the work. Review shall be for method only. The Contractor shall remain responsible for the adequacy and safety of the methods.

PART 2 – PRODUCTS

2.02 MATERIALS

- A. Backfill materials shall be natural or processed mineral soils, blasted and crushed rock, or masonry rubble. Fill materials shall be free of all organic material, trash, snow, ice, frozen soil or other objectionable materials. Clay soils having a natural in-place water content in excess of 30 percent are considered unsuitable for stockpiling and/or future use. Fill materials to be used have been classified under categories specified below.
- B. Embedment materials listed here include a number of processed materials plus the soil types defined by the USCS Soil Classification Systems in ASTM D2487. These materials are grouped into categories according to their suitability for this application:
1. Class I: Angular 6 to 40 mm (1/4 to 1-1/2 inches), graded stone including a number of fill materials that have regional significance such as coral, slag, cinders, crushed stone, and crushed shells.
 2. Class II: Coarse sands and gravels with maximum particle size of 40 mm (1-1/2 inches), including variously graded sands and gravels containing small percentages of fines, generally granular and non-cohesive, either wet or dry. Soil types GW, GP, SW and SP are included in this class.
 3. Class III: Fine sand and clayey gravels, including fine sands, sand-clay

mixtures, and gravel-clay mixtures. Soil types GM,GC, SM and SC are included in this class.

- 4. Class IV: Silt, silty clays and clays including inorganic clays and silts of medium to high plasticity and liquid limits. Soil types MH, CH and CL are included in this class. These materials are not to be used for bedding, haunching or initial backfill.
- 5. Class V: This class includes the organic soils OL, OH and PT as well as soils containing frozen earth, debris, rocks larger than 40 mm (1-1/2 inches) in diameter, and other foreign materials. These materials shall not be used for bedding, haunching and initial backfill.

C. Granular Fill, shall be sound, hard, durable crushed stone meeting the following gradation requirements and shall conform to ASTM C33, Size No. 57.

<u>Sieve Size</u>	<u>Percent Passing by Weight</u>
1-1/2-in	100
1-in	90-100
1/2-in	26-60
No. 4	0-7
No. 8	0-3

D. Sand shall conform to ASTM Standard C33 for concrete sand.

PART 3 – EXECUTION

3.01 EXCAVATION

- A. The Contractor shall proceed with caution in the excavation and preparation of the trench so that the exact location of underground structures in the trench zone may be determined before being damaged. He shall be held responsible for the repair or replacement of such structures when broken or otherwise damaged because of his operations.
- B. The Contractor shall make explorations and excavations at no additional charge to the Owner to determine the location of existing underground structures.
- C. Utilities and other piping shall be laid in open trenches as shown and specified. Trenches shall be excavated to the designated lines and grades, beginning at the outlet end and progressing toward the upper end in each case. Trenches for pipe shall be shaped to the lower 1/3 of the pipe and provide uniform and

continuous bearing. Bell holes shall be dug to allow ample room for working fully around each joint.

- D. Trenches shall be of minimum width to provide ample working space for making joints and shall be not less than 16 inches greater than the outer diameter of the pipe or more than 24 inches greater than the outer diameter of the pipe. Sides of trenches shall be closely vertical to top of pipe and shall be sheet piled and braced where soil is unstable nature. Above the top of the pipe, trenches may be sloped. The ridge of the trench above this level may be wider for sheeting and bracing and the performance of the work.
- E. Trenches shall be excavated on the alignments shown on the Plans, and to the depth and grade necessary to accommodate the pipes at the elevations shown. Where elevations of the invert or centerline of a pipe are shown at the ends of a pipe, the pipe shall be installed at a continuous grade between the two elevations.
- F. Excavation in excess of the depth required for proper shaping shall be corrected by bringing to grade the invert of the ditch with compacted coarse, granular material at no additional expense to the Owner. Bell holes shall be excavated to relieve bell of all load, but small enough to insure that support is provided throughout the length of the pipe barrel.
- G. Excavation in excess of the depths required for manholes and other structures shall be corrected by placing a subfoundation of 1500 psi concrete, at no additional expense of the Owner.
- H. If trenches are excavated to widths in excess of those specified, or if the trench walls collapse, the pipe shall be laid in accordance with the next better class of bedding at the expense of the Contractor.

3.02 TRENCHES

- A. Trenches shall be maintained in a safe condition to prevent hazardous conditions to persons working in or around the trench.
- B. Braced and sheeted trenches and open trenches shall comply with all State and Federal Laws and Regulations, and local ordinances relating to safety, life, health and property.
- C. The top portion of the trench may be excavated with sloping or vertical sides to any width which will not cause damage to adjoining structures, roadways, utilities, etc. The bottom of the trenches shall be graded to provide uniform bearing and support each section of the pipe on undisturbed soil every point

along its entire length, except for the portions of the pipe sections excavated for bell holes and for the sealing of pipe joints. Bell holes and depressions for joints shall be dug after the trench bottom has been graded and in order that the pipe rests upon the trench bottom for its full length and shall be only of such length, depth and width for making the particular type of joints. The bottom of the trench shall be rounded so that at least the bottom one-third of the pipe shall rest on undisturbed earth for the full length of the barrel as jointing operations will permit. This part of the excavation shall be done manually only a few feet in advance of the pipe laying by workmen skilled in this type of work.

- D. The sides of all trenches and excavation for structures shall be held by stay bracing, or by skeleton or solid sheeting and bracing according to conditions encountered, to protect the excavation, adjoining property and for the safety of personnel. Bracing and shoring may be removed then the level of the backfilling has reached the elevation to protect the pipe work an adjacent property. When sheeting or shoring above this level cannot be safely removed, it may be left in place. Timber left in place shall be cut off at least 2 feet below the surface.

3.03 PILING EXCAVATED MATERIALS

- A. All excavated material shall be piled in a manner that will not endanger the work and that will avoid obstructing roadways.

3.04 LIMIT TO LENGTH OF OPEN TRENCH

- A. Pipe trenches shall not be excavated more than 400 feet in advance of pipe laying and all work shall be performed to cause the least possible inconvenience to the public. Adequate temporary bridges or crossings shall be constructed and maintained where required to permit uninterrupted vehicular and pedestrian traffic.

3.05 REMOVAL OF UNSUITABLE MATERIAL

- A. Should overdepth excavation be necessary to remove unsuitable material and to replace with satisfactory material, the Contractor will be paid for the work in accordance with the General Conditions for removal and replacement of unsuitable material, based on the following requirements:
 - 1. When the trench excavation is excavated to the plan depth or as required by these Specifications, and soft or other material not suitable for bedding purposes is encountered in the excavation, the Contractor shall immediately notify the Engineer for inspection and measurement of the unsuitable material to be removed.

2. No overdepth excavation or backfilling of the overdepth shall start until proper measurements have been taken by the Engineer for the determination of the quantity in cubic yards of unsuitable material excavated. Backfill material and backfilling shall conform to the requirements specified in 3.08 below.
3. No payment will be made for any overdepth excavation of soft unstable material due to the failure of the Contractor to provide adequate means to keep the hole/trench dry.
4. No payment will be made for any overdepth excavation of the unsuitable material and replacement not inspected and measured by the Engineer prior to excavation.

3.06 BEDDING OF CONCRETE, DUCTILE IRON OR STEEL PIPE

- A. Pipe shall be laid on foundations prepared in accordance with ANSI/AWWA C600 as modified herein, and in accordance with the various classes of bedding required by the trench width and trench depth for the size of pipe to be laid. Typical bedding shall be included in the lump sum bid.
- B. Embedment shall be of the type shown on the plans or stated in the specifications for the utility system in which it is used.
- C. Bell Holes: Bell holes shall be provided in all classes of bedding to relieve pipe bells of all load, but small enough to insure that support is provided throughout the length of the pipe barrel.
- D. Coarse Granular Bedding: Coarse Granular Bedding material shall consist of crushed stone or pea gravel, clean and graded, 95 to 100 percent of which shall pass a 3/4 inch sieve with 95 to 100 percent retained on a No. 4 sieve. Bedding material shall be placed on a flat bottom trench and thoroughly compacted by tamping or slicing with a flat blade shovel. Compacted bedding material shall be extended up the sides of the pipe to the heights shown for the various classes of bedding.
- E. Overwidth Excavation: If trenches are excavated to widths in excess of those specified below, or if trench walls collapse, pipe shall be laid in accordance with the requirements for at least the next better class of bedding at the expense of the Contractor.
- F. Borrow Backfill: Borrow backfill will be required if there is not sufficient suitable material available from other parts of the work to backfill the trenches. Borrow backfill from approved borrow pits shall be used. Only those soils in the borrow

pits that meet the specified requirements for suitable material shall be used.

3.07 BEDDING OF PVC PIPE AND HDPE PIPE

- A. Pipe shall be bedded true to line and grade with uniform and continuous support from a firm base in accordance with ASTM D2321 as modified herein. Blocking shall not be used to bring the pipe to grade. Typical bedding material shall be included in the lump sum bid.
- B. Compaction of foundation, bedding, haunching and initial backfill shall extend to the trench wall.
- C. Embedment material in the area around the pipe shall be installed with care. Care shall be used to insure that sufficient material has been worked under the haunch of the pipe to provide adequate side support. Precautions must be taken to prevent movement of the pipe during placing of the material through the pipe haunch.
- D. Avoid contact between the pipe and compaction equipment. Compaction of haunching, initial backfill and backfill material shall be done in such a way so that compaction equipment will not have a damaging effect on the pipe.
- E. The trench depth shall be as shown on the plans or as required to provide the depth of cover as specified by the purchaser.
- F. Embedment shall be as shown on the plans or stated in the specifications for the utility system in which it is used.

3.08 BACKFILLING

- A. Backfilling consists of placing suitable materials removed during the excavation into the excavated areas, placing embedment materials and compacting the same to a density equal to or greater than what exists before excavation or as specified herein.
- B. All backfill material shall be free of stones, concrete and clay lumps larger than 1/3 cubic foot. Roots, stumps and rubbish which will decompose will not be permitted in the backfill. Backfill material shall have its moisture content corrected, as may be necessary before being placed in the trench to bring the moisture content to approximately "optimum" for good compaction. Any rock, stone, concrete, clay lumps larger than 1/3 cubic foot in volume, rubbish and debris shall be removed from the site and disposed of by the Contractor in a lawful manner.

- C. **Select Backfill:** Select backfill material shall be placed below, around each side, and over the top of the pipe in approximately horizontal layers not exceeding 8-inches in thickness to a minimum height of 12-inches above the pipe crown or greater as detailed herein and on the Drawings. This initial backfill shall be placed immediately after the pipes are laid and joints have been observed by the Engineer to anchor and protect the pipe from damage by subsequent backfill and ensure the uniform distribution of the loads over the top of the pipe. Select Material shall include Class I, II, III and other approved materials. If suitable select materials are not available from trench excavation, the Contractor will be required to obtain select materials elsewhere at no additional cost to the Owner. The Contractor shall backfill both sides of the pipe simultaneously to prevent side pressures and each layer shall be compacted thoroughly with mechanical tamping equipment in such manner as not to damage the pipe, pipe joints or shift the pipe alignment. Workmen shall not be permitted to walk over the pipe until at least 12 inches of compacted fill has been placed over the pipe. The Contractor shall not use water to obtain compaction except for adding water to the backfill material before placing in the trench to bring the moisture content to approximately "optimum" for good compaction.
- D. **General Backfilling:** After initial, select backfill material has been placed and tamped, the remainder of the trench may be backfilled with general excavated material, except that no rock, unless in small shattered fragments, will be permitted to be mixed with other backfill material.
1. **Backfilling under buildings and structures:** Backfilling under structures and buildings consists of placing structural fill in the trench in 4 inch maximum loose lifts (if hand tamped) and 6" maximum loose lifts (if machine tamped) and compacting an area from the undercut level to the slab support level to 100% of the modified Proctor maximum dry density (ASTM D 1557). No water shall be used to secure compaction except for adding water to the backfill material before placing in the trench to bring moisture content approximately "optimum" for good compaction. Each loose lift shall be tamped before additional backfill material is placed in the excavated area.
 2. **Street and Road Right – of – Way, Parking Areas, **Pump Station**, Yards and Other Traveled Areas:** Backfill shall consist of placing structural fill in the trench in uniform layers not exceeding eight inches (8") in thickness, with each layer thoroughly compacted to 95% of the modified Proctor maximum dry density (ASTM D 1557) with heavy duty mechanical tampers ("Whacker" or equal) to a height of at least thirty-six inches (36") or forty-eight inches (48") above the top of the pipe barrel.

3. The remainder of the excavation may be backfilled and tamped in the same manner, or if the Contractor so elects, he may place backfill in layers not exceeding twelve inches (12") and use wheel loading or heavy duty mechanical tamping equipment ("Hydra-Hammer" or equal). Pipe shall have at least thirty-six inches (36") of cover before wheel loading and at least forty-eight inches (48") of cover before using heavy duty tamping equipment ("Hydra-Hammer" or equal). The density of the backfilled material after compaction shall be equal to 95 percent of the maximum density obtainable at optimum moisture content as determined by the Modified Proctor Test (ASTM D 1557). Except in the upper 12 inches, water shall be added to backfill material only before being placed in the trench in order to bring the moisture content to approximately "optimum" for good compaction.
- E. In other areas, including woodlands, fields, pastures, areas not open to vehicular travel, and areas where no structures are proposed or anticipated in the future, the remainder of the ditch may be backfilled by placing fill in ditch and "walking-in" with wheel loaded equipment. Backfill material may be windrowed and maintained in a suitable manner so as to concentrate and pond rainfall runoff over the trench. After sufficient settlement has been obtained, the Contractor shall complete surface dressing, remove surplus material and clean up in accordance with these Specifications. Wherever trenches have not been properly filled, or if settlement occurs, they shall be refilled, smoothed off and finally made to conform to the surface of the ground. Backfilling shall be carefully performed and the original surface restored as specified herein. Compaction in these areas shall not be less than 90% of the modified Proctor maximum dry density. Surplus material shall be disposed of by the Contractor.

3.09 PROTECTION OF WATER SUPPLY PIPES

- A. Horizontal Separation: Sewers and force mains shall be laid at least 10 feet horizontally from any existing or proposed watermain. The distance shall be measured edge to edge. In cases where it is not practical to maintain a 10 foot separation, such deviation may allow installation of the sewer or force main closer to the watermain, provided that the watermain is in a separate trench or on a undisturbed earth shelf located on the side of the sewer or force main and at an elevation so the bottom of the watermain is at least 18 inches above the top of the sewer or force main.
- B. Crossings: Sewers and force mains crossing water mains shall be laid to provide a minimum vertical distance of 18 inches between the outside of the watermain and the outside of the sewer or force main. This shall be the case where the watermain is either above or below the sewer or force main. The crossing shall be arranged so that the sewer or force main joints will be equidistant and as far as possible from the watermain joints. Where a watermain crosses under a

sewer or force main, adequate structural support shall be provided for the sewer or force main to prevent damage to the watermain.

- C. Special Conditions: When it is impossible to obtain proper horizontal and vertical separation as stipulated above, the sewer or force main shall be designed and constructed equal to water pipe, and shall be pressure tested to assure water tightness prior to backfilling.

3.10 UTILITY CONSTRUCTION IN OTHER EXCAVATION

- A. Where utilities are required to be constructed in areas also requiring excavation and backfill for other work, coordinate the work so that the parts come together properly and the construction of the various parts can be done without damage to other parts. Place bedding which will form bearing for pipes, using suitable material and shaping to the lower 1/3 of the pipe to provide uniform and continuous bearing. Compaction of backfill material which will form bearing shall be equal to that specified hereinbefore under "Backfilling under buildings and structures". After the pipe or other utility is placed, backfilling shall proceed as specified hereinbefore following the requirements specified under Section 3.08 as applicable.

END OF SECTION

SECTION 02350
SHEETING, SHORING, AND BRACING

PART 1 - GENERAL

1.01 SCOPE

- A. This section specifies requirements for sheeting, shoring, and bracing of trenches and excavations greater than five (5) feet in depth. Where sheet piling, shoring, sheeting, bracing or other supports are necessary, they shall be furnished, placed, maintained, and except as shown or specified otherwise, removed by the Contractor.

1.02 DESIGN REQUIREMENTS

- A. The design, planning, installation and removal, if required, of all sheeting, shoring, sheet piling, lagging, and bracing shall be accomplished in such a manner as to maintain the required excavation or trench section and to maintain the undisturbed state of the soils below and adjacent to the excavation.
- B. The Contractor shall design sheeting, shoring, and bracing in accordance with the OSHA Safety and Health Standards as well as state and local requirements.
- C. Horizontal strutting below the barrel of a pipe and the use of pipe as support are not acceptable.
- D. When the construction sequence of structures requires the transfer of bracing to the completed portions of any new structure or to any existing structure, the Contractor shall provide the Engineer with a complete design analysis of the expected impact of that bracing on the structure. This action shall in no way absolve the Contractor of responsibility of damage resulting from said bracing.

1.03 REFERENCES

- A. OSHA 2207 Revised 1987 – OSHA Safety and Health Standards

1.04 SUBMITTALS

- A. Prior to starting any excavation work requiring sheeting, shoring, and bracing, the Contractor shall submit his plans for trench and excavation support systems to the Engineer for review and comment. No excavations shall be started until the Contractor has obtained written acceptance of the trench support system. Said acceptance will be to assure the Owner of the Contractor's general compliance

with the required codes and shall not be construed as a detailed analysis for adequacy of the support system, nor shall any provisions of the above requirements be construed as relieving the Contractor of his overall responsibility and liability for the work. Submittals shall include the following:

1. Design calculations and method of installation and removal of all sheeting, sheet piling, shoring and bracing. Calculations shall be made by a professional structural or civil engineer in the state of the project.
2. Detailed excavation support drawings.

PART 2 - EXECUTION

2.01 GENERAL

- A. Contractor shall be responsible for supporting and maintaining all excavations required even to the extent of sheeting and shoring the sides and ends of excavations with timber or other supports. If the sheeting, braces, shores, and stringers or walling timbers or other supports are not properly placed or are insufficient, the Contractor shall provide additional or stronger supports. The requirement of sheeting or shoring or the addition of supports shall not relieve the Contractor of his responsibility for their sufficiency. All sheeting, shoring and bracing shall have sufficient strength and rigidity to withstand the pressure exerted and to conform to OSHA Safety & Health Standard (29 CFR 1926/1910) OSHA 2207, latest edition.
- B. Excavations adjacent to existing or proposed buildings and structures or in paved streets or alleys shall be sheeted, shored and braced adequately to prevent undermining beneath or subsequent settlement of such structures or pavements. Underpinning of adjacent structures shall be done when necessary to maintain structures in safe condition. The Contractor shall be held liable for any damage resulting to such structures or pavements as a result of his operations.
- C. Trench sheeting shall be left in place until the backfilling has been completed to elevation not less than twelve (12) inches above the top of the pipe. Unless otherwise ordered in writing, sheeting shall then be cut off at the top of the lowest set of bracing and the upper section shall be removed. All voids left by sheeting along trenches shall be carefully refilled and rammed with suitable tools.
- D. In unstable ground, sheeting shall be driven to such depth below bottom of the trench or side of the excavation as required to ensure stability.
- E. The need and adequacy of sheeting, shoring, bracing, or other provisions to protect

men and equipment in a trench or other excavation shall be the sole and exclusive responsibility of Contractor.

- F. Underpin adjacent structures, which may be damaged by excavation work, including service utilities and pipe chases.
- G. Notify Engineer of unexpected subsurface conditions and discontinue work in affected area until notification to resume work.
- H. Protect bottom of excavations and soil adjacent to and beneath foundations from frost.
- I. Grade top perimeter of excavation to prevent surface water run-off into excavation.

END OF SECTION

SECTION 02370
SOIL EROSION AND SEDIMENT CONTROL

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Temporary erosion and sediment control measures shall be employed during the construction period and shall include all measures required to prevent soil erosion at the site until permanent erosion control measures are installed. Work shall be accomplished through the use of vegetative measures, such as mulching and grassing, and structural practices including, construction exits, sediment barriers, check dams, inlet sediment traps, etc.
- B. Erosion and sediment control measures described herein shall be continued until such time as permanent planting and restoration of natural areas has provided for final stabilization at project site.
- C. Failure to install and maintain temporary erosion and sediment control measures throughout the construction period may be cause to halt construction by governing authorities until such measures are correctly installed and operational. Activity covered in this contract is regulated by Georgia’s Erosion and Sedimentation Act (O.C.G.A. 12-7-1, *et seq.*).

1.02 RELATED SECTIONS

- A. Section 02920 – Permanent (Perennial) Grassing and Landscaping
- B. Construction Drawings.

1.03 REFERENCES

- A. American Society for Testing and Materials (ASTM).
- B. Georgia’s Erosion and Sedimentation Act (O.C.G.A. 12-7-1, *et seq.*)
- C. “Manual for Erosion and Sediment Control in Georgia” published by the State Soil and Water Conservation Commission of Georgia. Contractor shall be responsible for the acquisition and utilization of the latest edition of the “Manual for Erosion and Sediment Control in Georgia”.

1.04 DEFINITIONS

- A. Final Stabilization: All soil disturbing activities at the site have been completed, and that for unpaved areas and areas not covered by permanent structures, at least 70% of the soil surface is uniformly covered in permanent vegetation or equivalent permanent stabilization measures (such as the use of rip rap, gabions, permanent mulches, or geotextiles) have been employed.
- B. Land-Disturbing Activity: Any activity which may result in soil erosion from water or wind and the movement of sediments into State waters or onto lands within the State, including, but not limited to clearing, grubbing, dredging, grading, excavating, transporting, and filling.
- C. Stabilization: 70% of the surface area of the site is covered in a uniform, vegetative cover (permanent or temporary) or anchored mulch of the appropriate thickness with 90% coverage.

1.05 REGULATORY REQUIREMENTS

- A. Contractor shall comply with applicable codes, rules, ordinances, regulations, and laws of local, municipal, state and/or federal authorities having jurisdiction over project.

PART 2 – PRODUCTS

2.01 STRUCTURAL PRACTICES

- A. All products used must satisfy specifications set forth by the “Manual for Erosion and Sediment Control in Georgia”.

2.02 MULCH

- A. Dry straw, hay, or wood cellulose fiber of good quality, free of weeds and foreign matter detrimental to plant life.

2.03 TEMPORARY GRASSING

- A. All grass seed shall be certified by the Georgia Department of Agriculture.
- B. All grass seed shall be in undamaged containers showing percentage of seed mix, year of production, net weight, date of packaging, and location of packaging.

2.04 PERMANENT (PERENNIAL) GRASSING

- A. See Section 02920 – Permanent (Perennial) Grassing and Landscaping.

2.05 FERTILIZER AND LIME

- A. Fertilizer: Standard commercial grade grass fertilizer with a 10-10-10 (N-P-K) proportion.
- B. Lime: Natural, agricultural grade, ground or pulverized dolomitic limestone.

2.06 DUST CONTROL

- A. Water, calcium chloride, anionic asphalt emulsion, latex emulsion, resin-in-water emulsion or other approved by the Georgia Department of Transportation may be used.

PART 3 – EXECUTION

3.01 GENERAL

- A. The Contractor shall prevent the escape of sediment from the area under construction by installing erosion and sediment control measures and practices prior to, or concurrent with, land-disturbing activities.
- B. The Contractor shall maintain erosion and sediment control measures at all times.
- C. The Contractor shall complete mulching, temporary grassing, or permanent (perennial) vegetation on all exposed areas within 14 days after disturbance.
- D. All structural and vegetative erosion and sediment control measures shall be designed, installed and maintained according to the “Manual for Erosion and Sediment Control in Georgia”.
- E. As a minimum, structural practices shall be located and installed, and all disturbed soil areas shall be stabilized using mulching and/or grassing, as specified by the Drawings. If full implementation of the Drawings does not provide for effective erosion and sediment control, the Contractor shall be responsible for the implementation of additional erosion and sediment control measures to control or treat the sediment source.
- F. No runoff from disturbed areas shall leave the site untreated.
- G. Erosion Control Schedule
 - 1. Prior to the pre-construction conference, Contractor shall submit to the

Engineer his proposed erosion control plan for the project in accordance with requirements of this section. The schedule shall be based on an analysis of the project conditions and shall be in written form. This schedule shall specifically indicate the sequence of clearing and grubbing, earthwork operations, including trenching and backfilling, construction of permanent erosion control features and the proposed uses of temporary erosion and sediment control features. Schedule shall also include proposed methods to prevent pollution of streams, lakes and rivers and other water resources.

- 2 Contractor shall outline his proposed methods of controlling erosion and preventing pollution on public and construction access roads, staging areas and waste disposal areas.
 - 3 Construction shall not commence until the Engineer has accepted the aforementioned plans and schedules. Contractor will be responsible for accomplishment of work in accordance with accepted plans and schedules. Engineer may approve changes made necessary by unforeseen circumstances that are beyond the control of Contractor.
- H. Engineer has the authority to limit the surface area of erodible earth materials exposed by clearing and grubbing, the surface area of erodible earth exposed by excavation and backfill operations, and to direct Contractor to provide immediate permanent or temporary erosion and pollution control measures to prevent contamination of adjacent land or water courses.
- I. Clearing and grubbing operations shall be so scheduled and performed that grading operations and permanent erosion control features can immediately follow thereafter, if the project conditions permit. Otherwise, temporary erosion control measures will be required between successive construction stages.
- J. Engineer will require Contractor to limit the area of excavation, trenching and pipe laying operations in progress commensurate with Contractor's capability and progress in keeping finish grading, mulching, seeding and other permanent and/or temporary measures current with accepted schedule.

3.02 STRUCTURAL PRACTICES

- A. All structural practices shall be designed, installed and maintained in accordance with specifications set forth in Chapter 6, Section III of the "Manual for Erosion and Sediment Control in Georgia".
- B. Sediment accumulation at structural practices shall not exceed 50% of structure

capacity or height.

- C. All structural practices shall be inspected frequently and materials promptly repaired or replaced as necessary to allow proper function of the device.
- D. Any construction vehicle passing from a disturbed area onto any paved area or public right-of-way shall pass over a gravel construction exit. If the gravel construction exit cannot adequately remove soil from the vehicle, the vehicle shall be washed and runoff routed to a sediment trap or basin. Any mud or debris tracked or spilled onto roadway shall be immediately removed.

3.03 MULCHING

- A. All mulch used as a singular method for erosion control shall be applied and anchored in accordance with specifications set forth in Chapter 6, Section II of the “Manual for Erosion and Sediment Control in Georgia”.
- B. Mulch can be used for erosion control for up to six months provided that the mulch is applied at the appropriate depth (depending on the type of mulch used), anchored, and maintains a continuous 90% or greater cover of the soil surface.
- C. Where staged construction or other conditions not controlled by Contractor prohibit the completion of work in a continuous manner, Engineer may order Contractor to apply mulch to an erodible area.
- D. If the area being mulched will eventually support a cover of perennial vegetation, 20-30 pounds of nitrogen per acre shall be added in addition to the normal nitrogen application rate specified in Section 02920 – Permanent (Perennial) Grassing and Landscaping.
- E. Mulch can be applied to areas at rough grade. With the use of an appropriate anchoring method, mulch may be applied to areas as steep as 2:1 (H:V).
- F. All mulch shall be anchored. Install commercial netting according to manufacturer’s specifications.
- G. Wood waste shall be anchored with netting consisting of openings no larger than the average size of the wood waste chips.

3.04 TEMPORARY GRASSING

- A. Temporary grassing shall be applied in accordance with specifications set forth in Chapter 6, Section II of the “Manual for Erosion and Sediment Control in

Georgia”.

- B. Temporary grassing can be employed instead of mulch if an area will remain undisturbed for less than six months.
- C. Where staged construction or other conditions not controlled by Contractor prohibit the completion of work in a continuous manner; Engineer may order Contractor to apply temporary grassing to an erodible area.
- D. Temporary grassing shall consist of sowing a quick growing species of grass suitable to the area and season. Certified temporary grass seed shall be applied at the rates and dates as indicated in the Plans

3.05 PERMANENT (PERENNIAL) GRASSING

- A. See Section 02920 – Permanent (Perennial) Grassing and Landscaping.

3.06 GRADING OPERATIONS

- A. Grading operations shall be scheduled so that ground surface will be disturbed for the shortest possible time before permanent construction is installed. Large areas shall be maintained as flat as possible to minimize soil transport through surface flow.
- B. Wherever steeper slopes or abrupt changes in grade are required, a compacted diversion or berm shall be constructed at the top of slope to cause surface water to flow along the diversion to a control point to be transported down slope in a slope drain. In no case shall surface water be allowed to flow uncontrolled down slopes.
- C. Unless otherwise approved in writing by Engineer, construction operations in rivers, streams and impoundments shall be restricted to those areas that must be entered for the construction of temporary or permanent structures, or at locations shown on the Drawings.
- D. Mechanized equipment shall not be operated in live streams except as may be minimally required, unless otherwise approved in writing by Engineer.
- E. Frequent fording of live streams with construction equipment shall not be permitted. Temporary bridges or other structures, designed in accordance with specifications by the “Manual for Erosion and Sediment Control in Georgia”, shall be used whenever an appreciable number of stream crossings are necessary.

3.08 DUST CONTROL

- A. Dust raised from vehicular traffic shall be controlled by wetting down the access road with water. The use of a deliquescent chemical, such as calcium chloride, may be used if the relative humidity is over 30%. Chemicals shall be applied in accordance with the manufacturer's recommendations.

3.09 CLEAN-UP AND REMOVAL

- A. Temporary erosion and sediment control measures shall be removed and bare areas stabilized when all areas draining to the control(s) are no longer under construction and have reached final stabilization.
- B. All sediment accumulated at erosion and sediment control structures shall be removed and properly disposed of before the structure is removed.
- C. Sediment deposits shall be uniformly spread at an appropriate location and stabilized with mulch and grassing.
- D. All false-work, sheeting or piling which are to be removed, debris, and other obstructions shall be promptly cleared from rivers, streams and impoundments as soon as conditions permit.

END OF SECTION

**SECTION 02400
CONSTRUCTION DEWATERING**

PART 1 GENERAL

- 1.01 The Contractor shall be responsible for controlling groundwater in a manner that will preserve the strength of the foundation soils, will not cause instability of the excavation slopes, and will not result in damage to existing structures.
- 1.02 Where permeable soils are encountered at subgrade elevations the Contractor shall maintain the groundwater level a minimum of 3 feet below the prevailing excavation level.
- 1.03 The Contractor shall submit for the Engineers' approval a construction dewatering plan. The plan shall indicate the method of dewatering to be used, the location of any wells or pumps, and where pumped groundwater is to be discharged. No excavation will be allowed without an approved dewatering plan
- 1.04 The groundwater table will be continuously monitored around the proposed lift station structures. The contractor shall be responsible for maintaining the groundwater level below structure at all times the structure is dewatered and under construction. Wells installed for dewatering during construction shall be capped and remain in place after construction is complete.

PART 2 PRODUCTS

- 2.01 Equipment used for dewatering is optional to the Contractor.
- 2.02 Mechanical equipment used shall be in good working order and suitable for use under the anticipated conditions.
- 2.03 Wells and well points, if used, shall be installed with suitable screens and filters so that continuous pumping of fines does not occur.

PART 3 EXECUTION

- 3.01 The Contractor shall maintain and operate his dewatering equipment until the permanent structure is in place.
- 3.02 No compensation for removal of unstable material below the subgrade shall be allowed if in the opinion of the Engineer, modified dewatering techniques would solve the problem and result in a suitable subgrade.

- 3.03 Dewatering discharge shall be accessible for collection of samples by the Engineer.
- 3.04 Contractor is responsible for providing back-up/emergency power for all dewatering equipment during construction. Any damage to work in place caused by insufficient dewatering shall be replaced and/or repaired at no additional cost to the Owner.

END OF SECTION

**SECTION 02530
SANITARY SEWER COLLECTION SYSTEM**

PART 1 – GENERAL

1.01 SCOPE

- A. This section of the Specifications describes products to be incorporated into the sanitary sewer and requirements for the installation and use of these items. The contractor shall furnish all products and perform all labor necessary to fulfill the requirements of these Specifications. It includes, but is not limited to the construction of the following items.
1. Sewer Pipes
 2. Force Main
 3. Connection to Existing System
 4. Fittings, Adaptors, Couplings

1.02 RELATED WORK

- A. Other work required for the construction of the sanitary sewer collection system is specified in the following of the specifications:

Section No.	Title
02315	Excavation, Trenching and Backfilling for Utilities
02370	Soil Erosion Control
02920	Grassing

1.03 OPTIONS

- A. The Contractor will furnish the Engineer and the Owner a description of all materials before ordering. The Engineer will review the Contractor's submittals and provide in writing an acceptance or rejection of material. However, an acceptance of any material by the Engineer does not relieve the Contractor of this responsibility to meet the requirements of the construction plans or these specifications.

1.04 QUALITY ASSURANCE

- A. Material and equipment shall be the standard product of a manufacturer who has manufactured them for a minimum of 2 years and who provides published data on the quality and performance of the project.

- B. A Subcontractor for any part of the work must have experience on similar work and if required, furnish the Engineer with a list of projects and the Owners or Engineers who are familiar with his competence.
- C. Devices, equipment, structures, and systems not designed by the Engineer that the Contractor wishes to furnish shall be designed either by a registered professional engineer or by someone the Engineer approved as qualified. If required, complete design calculations and assumptions shall be furnished to the Engineer or the Owner before acceptance.
- D. All testing of the piping shall be made by the Contractor with equipment qualified by the Owner, Engineer, or utility company and in the presence of the Engineer, Owner and utility company. The Engineer or his representative reserves the right to accept or reject testing equipment.
- E. Soil testing shall be done by a testing laboratory regularly engaged in soil testing, and shall be approved by the Engineer prior to engagement. Mill certificates of test on materials made by manufacturers will be accepted provided the manufacturer maintains an adequate testing laboratory, make regularly scheduled tests that are spot checked by an outside laboratory, and furnishes satisfactory certificates with the name of the one making the test.
- F. The details of all welded joints shall comply with all of the requirements for joints, which are accepted without qualification test under the "Code of Arc and Gas Welding in Building Construction of the American Welding Society". Workmanship shall conform to A.I.S.C. Specifications for Fabrication and Erection. All work shall be executed by skilled workmen under experienced supervision. All welding shall be done by welders who have been previously qualified by tests as prescribed in the "American Welding Society Standard Qualification Procedure" to perform the type of work required. Welders shall have passed the qualification test (Qualification tests using procedures covered in AWSS B3.0 Part II) within the preceding 12 months.

1.05 ALTERNATIVES

- A. The intention of these specifications is to produce the best system for the Owner. If the Contractor suggests that alternate material, equipment or procedures will improve the results at no additional costs, the Engineer and the Owner will examine the suggestion and if it is accepted, it may be used. The basis upon which acceptance of an alternate will be given is its value to the Owner, and not for the convenience of the Contractor.

1.06 GUARANTEE

- A. The contractor shall guarantee the quality of the materials, equipment, and workmanship for 12 months after acceptance of the completed Project. Defects discovered during that period shall be repaired by the Contractor, at no cost to the Owner. The Performance bond shall reflect this guarantee.
- B. The manufacturers of equipment, valves, pumps, controls, measuring devices and special equipment shall test the equipment shall test the equipment at field conditions for compliance with the specifications. The manufacturer shall guarantee his product to be free from defects in material and factory workmanship for a period of 1 year from date of acceptance of the completed project, provided the product is properly installed, serviced and operated under normal conditions according to the manufacturer's instructions. The manufacturer shall furnish the service of a representative of the Engineer with a certificate that the equipment meets the specifications and will perform as required. The manufacturer shall furnish four field trips to the plant by a service representative during the first year after completion of the Project at no cost to the Owner.

1.07 EXISTING UTILITIES

- A. All known utility facilities are shown schematically on plans, and are not necessarily accurate in location as to plan or elevation. Utilities such as service lines or unknown facilities not shown on plans will not relieve the contractor of his responsibility under this requirement. "Existing Utilities Facilities" means any utility that exists on the projects in its original, relocated or newly installed position. The Contractor will be held responsible for the cost of repairs to damaged underground facilities: even when such facilities are shown on the plans. The Contractor shall contact all utility companies prior to beginning work and request an accurate field location of their respective utility lines.
- B. Damage to any part of the existing water system facilities by the Contractor or Subcontractors, that is required by the user's and Owner's forces, shall be charged to the Contractor on the basis of time and material, plus 30% for overhead and administration.

1.08 ACCEPTANCE OF PORTIONS OF WORK

- A. The Owner reserves the right to accept and use any portion of the work whenever it is considered in the public interest to do so.

1.09 RECORD DATA

- A. It will be required of the Contractor to keep accurate, legible records of the location of any deviations from the construction drawings, any additional items

or structures to the construction drawings. These records will be made available to the Engineer before his inspection for incorporation into the Engineer's Record Drawings.

PART 2 – PRODUCTS

Products and materials used in the work shall conform to the following:

2.01 SANITARY SEWER PIPE (GRAVITY SEWER)

A. Ductile Iron Pipe – Shall conform to ANSI A21.50 (AWWA C-150) latest revision, ANSI A21.51 (AWWA C-151) latest revision, and ASTM A746. All pipe, except specials, shall be furnished in nominal lengths of 18 to 20 feet. All ductile iron pipes and fittings shall be bituminous coated on the outside and lined with Tnemec 431 on the inside. The size of the pipe shall be as indicated on the drawings. All pipe shall have a Pressure Class 350 pressure rating.

1. Coating on the outside shall be an asphaltic coating approximately 1 mil thick. The finished coating shall be continuous, smooth, neither brittle when cold or sticky when exposed to the sun, and shall be strongly adherent to the iron.
2. Tnemec Series 431 Polyamine Ceramic Epoxy is a two component, modified polyamine ceramic epoxy formulated for corrosion control and shall conform to the following:
 - a. Solids by Volume: 100%
 - b. Hazard Air Pollutants: Zero
 - c. Ceramic Hollow Microspheres: 20 % by volume (no silica fume, fly ash, or alumina dust)
 - d. Pigment volume concentration: less than 22%
 - e. Coal-Tar Content: Zero
 - f. Color- Sewer Pipe Green
 - g. Dry Film Thickness- 40 mils.

- B. Polyvinyl Chloride (PVC) Pipe – Shall be unplasturized polyvinyl chloride with integral wall bell and spigot joints with a rubber ring gasket. Pipe and fittings shall meet the requirements of ASTM-D 3034 SDR 35 ASTM F679 for use as a gravity sewer conduit, except for depths greater than ten feet (10') where ductile iron pipe must be used. All pipe must be installed in accordance with ASTM D 2321, with additional bedding as required in these specifications or project details. Sizes and dimensions shall be as shown in the following table.

Nominal Size	Outside Diameter		Minimum Wall Thickness
	Average	Tolerance	
8"	8.400	±0.010	0.240
10"	10.500	±0.013	0.300
12"	12.500	±0.016	0.360
15"	15.300	±0.017	0.437
18"	18.700	±0.019	0.719
24"	24.803	±0.032	0.954

1. Minimum pipe stiffness (F/Y) at 5% deflection shall be 46 psi for all sizes when tested in accordance with ASTM D2412.
2. PVC gravity sewer pipe shall be supplied in lengths no longer than 13 feet.
3. Each length of pipe shall be marked with the manufacturer's name, trade name, nominal size, class, hydrostatic test pressure, manufacturer's standard symbol to signify it was tested, and date of manufacture. Each rubber ring shall be marked with the manufacturer's identification, the size, the year of manufacture, and the classes of pipe with which it can be used.

2.02 PIPE JOINTS (GRAVITY SEWER)

- A. Ductile Iron Pipe (D.I.) – Shall be flexible rubber gasket Type II, or mechanical joint Type III, conforming to ASA Specification A21.11.
- B. Polyvinyl Chloride (PVC) Pipe – Shall be flexible gasket joints for PVC sewer pipe and shall be compression type conforming to ASTM D-3212. The gasket shall conform to ASTM F-477.
- C. Transition Joints – The transition between sewer pipes of different materials shall be made by either concrete collar or by special adapters made for that purpose. Adapters between cast iron pipe and pipe of materials will be accepted

upon approval by the Engineer. In most cases where special adapters are not available or not approved by the Engineer, concrete collars will be used.

2.03 FORCE MAIN

- A. Polyvinyl Chloride (PVC) Pipe and Fusible Polyvinyl Chloride (FPVC) Pipe – Pipe 12” and smaller shall conform to AWWA C900-DR18 and pipe larger than 12” shall conform to AWWA C905-DR18. Pipe shall be made of compounds conforming to ASTM D1784 with a cell classification of 12454. Integral bells shall incorporate gaskets meeting the requirements of ASTM F477 and be locked into the bell. The assembled joint shall meet the requirements of ASTM D3139. The nominal laying length of the pipe shall be 20 feet.
- B. HDPE Pipe – High Density Polyethylene - High density polyethylene pipe shall be manufactured in accordance with ASTM D 3035, Polyethylene (PE) Plastic Pipe and shall be so marked. Each production lot of pipe shall be tested for (from material or pipe) melt index, density, % carbon, (from pipe) dimensions and either quick burst or ring tensile strength (equipment permitting). Pipe shall be DIPS - PE 4710, DR-17, rated at 125 psi, or of the DR called out in the plans.
1. Method of Pipe Delivery – Piping shall be delivered to the job site in 20 or 40 linear foot sections for pipe greater than or equal to 5” diameter (nominal) and shall be delivered and installed from spools for pipe less than or equal to 4” in diameter (nominal).
 2. Manufacturers:
Manufacturers that are qualified and approved by the Project Engineer are listed below. Products from unapproved manufacturers are prohibited.

ISCO Industries, LLC
Performance Pipe, Inc.
JM Eagle

Materials used for the manufacture of polyethylene pipe and fittings shall be PE4710 high density polyethylene meeting cell classification 445574C per ASTM D 3350; and shall be listed in the name of the pipe and fitting Manufacturer in PPI1 TR-4, Recommended Hydrostatic Strengths and Design Stresses for Thermoplastic Pipe and Fittings Compounds, with a standard grade rating of 1600 psi at 73°F. The Manufacturer shall certify that the materials used to manufacture pipe and fittings meet these requirements.

3. Interchangeability of Pipe and Fittings: Polyethylene pipe and fittings shall be produced by the same Approved Manufacturer. Products made by sub-contractors or Manufacturer’s distributor are not acceptable. Pipe and

fittings from different Approved Manufacturers shall not be interchanged.

4. Jointing Method – Butt Fusion

Pipe segments and fittings shall be joined using the butt fusion method. The fusion equipment operator shall be trained on the manufacturer's recommended procedure within the past 12 months. The contractors shall be responsible for verifying that the fusion equipment is in proper operating condition. The fusion equipment will be equipped with a datalogger and records of the welds shall be maintained for five (5) years. Fusion beads shall not be removed.

5. Service Identification Stripes

Permanent identification of piping service shall be provided by co-extending four equally spaced color stripes into the pipe outside surface. The striping material shall be the same material as the pipe material except for color. The following colors shall be used to identify piping service:

Green stripes – sanitary sewer and force mains

Stripes printed on the pipe outside surface shall not be acceptable.

6. Polyethylene Fittings & Custom Fabrications

Polyethylene fittings and custom fabrications shall be molded or fabricated by the pipe manufacturer. Butt fusion outlets shall be made to the same outside diameter, wall thickness, and tolerances as the mating pipe. All fittings and custom fabrications shall be fully rated for the same internal pressure as the mating pipe. Pressure de-rated fabricated fittings are prohibited.

7. Molded Fittings

Molded fittings shall be manufactured in accordance with ASTM D 3261, Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing, and shall be so marked. Each production lot of molded fittings shall be subjected to the tests required under ASTM D 3261.

8. X-Ray Inspection

The Manufacturer shall submit samples from each molded fittings production lot to x-ray inspection for voids, and shall certify that voids were not found.

9. Fabricated Fittings

Fabricated fittings shall be made by heat fusion joining specially machined shapes cut from pipe, polyethylene sheet stock, or molded fittings. Fabricated fittings shall be rated for internal pressure service equivalent to the full-service pressure rating of the mating pipe. Directional fittings 16" DIPS and larger such as elbows, tees, crosses, etc., shall have a plain end inlet for butt fusion and flanged directional outlets. Part drawings shall be submitted for the approval of the Project Engineer.

10. Polyethylene Flange Adapters

Flange adapters shall be made with sufficient through-bore length to be clamped in a butt fusion joining machine without the use of a stub-end holder. The sealing surface of the flange adapter shall be machined with a series of small v-shaped grooves to provide gasket less sealing, or to restrain the gasket against blow-out. Flanged transitions are acceptable only for above-ground connections.

11. Back-up Rings & Flange Bolts

Flange adapters shall be fitted with lap joint flanges pressure rated equal to or greater than the mating pipe. The lap joint flange bore shall be chamfered or radiused to provide clearance to the flange adapter radius. Flange bolts and nuts shall be Grade 2 or higher. Flanged transitions are acceptable only for above-ground connections.

12. HDPE Adapters for Buried Transitions

Buried HDPE pipe to be connected to mechanical joint, bell-type joint or restrained joint pipe shall be provided at all transitions from HDPE pipe to non-HDPE pipe. Such restrained transitions shall include clamps, adapter kits, and other manufacturer approved restraint items so that the connection is fully restrained. The transitions shall have stiffeners, shall be compatible with the pipe to be connected and shall be butt-fused to the HDPE pipe to be so connected.

- C. Fittings FOR PVC AND D.I. PIPE – All fittings shall be ductile iron, compact in weight and size, with restrained joints meeting the requirements of AWWA C110/ANSI A21.10, or AWWA C153/ANSI A21.4, and with a minimum rated working pressure of 250 psi. Fittings shall be mechanical joint and have a nominal wall thickness of Class 54 Ductile Iron Pipe. They shall be furnished with a bituminous outside coating and lined with Tnemec 431 Ceramic Epoxy or

equal. Color of finish coat shall be sewer pipe green to match pipe. Special adapters shall be provided, as recommended by the manufacturer, to adapt the PVC pipe to mechanical jointing with cast or ductile iron pipe, fittings or valves.

- D. Fittings FOR HDPE PIPE – All fittings shall be butt-fused as described above.
- E. Thrust Blocking – Concrete having compressive strength of not less than 3000 psi shall be used for all bends/fittings and constructed as per details in the plans. Bends exceeding 22-1/4 degrees, crosses with one opening plugged, and all tees shall be backed with concrete as a thrust block. Blocking shall be placed between solid ground and the fitting to be anchored; the area of bearing on the pipe and on ground in each instance shall be that shown on the plans in detail. The blocking shall be so placed that the pipe fitting joints will be accessible for repair. No extra payment will be made for the thrust blocks.

2.04 EXPANSION JOINTS

- A. Expansion joints shall be manufactured of molded neoprene with filled triple arches. Joints shall be reinforced with galvanized 3/8-inch split steel retaining rings placed directly against the inside of the flanged to prevent damage to the rubber surface when the bolts are tightened. Expansion joints shall be suitable for buried service or above ground service. Flanges shall be drilled to ANSI 125#. Working pressures as follows:

Size	Pressure
1"-4"	165#
5"-12"	140#
14"	85#
16"-24"	65#
26"-66"	55#

- B. Maximum temperature shall be 180 degrees F and shall be capable of a maximum 1-1/2-inch lateral movement. Expansion joints shall be Model J-I as manufactured by the Red Valve Company, or approved equal.

2.05 FLANGED ADAPTORS

- A. Flanged adaptors where shown on the Drawings shall be "Uni-Flange" as manufactured by Uni-Flange Corporation, Series 400.
- B. Flange shall be ductile iron designed to meet the requirements of ANSI D16. Set screw shall be AISI 4140 steel, heat treated, zinc.

- C. Where shown on the Drawings adaptor shall be harnessed.

2.06 FLEXIBLE COUPLINGS

- A. Flexible couplings shall be either the split type or the sleeve Type
 1. Split type coupling shall be used with all interior piping and with exterior piping as noted on the Drawings. The couplings shall be mechanical type for radius groove piping. The couplings shall mechanically engage and lock grooved pipe ends in a positive couple and allow for angular deflection and contraction and expansion.
 2. Couplings shall consist of malleable iron, ASTM Specification A47, Grade 32510 housing clamps in two or more parts, a single chlorinated butyl composition sealing gasket with a "C" shaped cross-section and internal sealing lips projecting diagonally inward, and two or more oval track head type bolts with hexagonal heavy nuts conforming to ASTM Specification A183 and A194 to assemble the housing clamps. Bolts and nuts shall be 316 stainless steel.
 3. Victaulic type couplings and fittings may be used in lieu of flanged joints if approved by the Engineer. Pipes shall be radius grooved as specified for use with the Victaulic couplings. Flanged adapter connections at fittings, valves, and equipment shall be Victaulic Vic Flange Style 741, equal by Gustin-Bacon Group, Division of Certain-Teed Products, Kansas City, Kansas, or equal.
 4. Sleeve type couplings shall be used where shown on the Drawings. The couplings shall be of steel and shall be Dresser Style 38, Smith Blair Style 413, Baker Allsteel, or equal. The coupling shall be provided with 316 stainless steel bolts and nuts unless indicated otherwise.
 5. All couplings shall be furnished with the pipe stop removed.
 6. Couplings shall be provided with gaskets of a composition suitable for exposure to the liquid within the pipe.
 7. If the Contractor decides to use victaulic couplings in lieu of flanged joints, he shall be responsible for supplying supports for the joints.

2.07 FLEXIBLE CONNECTORS

- A. Flexible connectors shall be constructed of bronze hose and braid with female copper tube sweat fittings brazed on each end. Connectors shall be Style BF as

manufactured by Vibration Mountings and Controls, Inc., Butler, N.Y., equal by American, Waterbury, Conn., or equal.

2.08 PIPE SLEEVE SEALS

- A. A watertight seal at all wall sleeves shall be obtained using expandable rubber seal rings equal to Link-Seal as shown on the Drawings. These seal rings shall be the modular mechanical type consisting of synthetic rubber links shaped to continuously fill the annular space between the pipe and wall sleeve. Links shall be loosely assembled with bolts to form a continuous rubber belt around the pipe with a pressure plate under each bolt head and nut. After the seal assembly is positioned in the sleeve, tightening of the bolts shall cause the rubber sealing sleeve. The watertight seal shall be effective against a hydrostatic head of at least 40 feet. The seal shall also be constructed so as to provide electrical insulation between the pipe and wall, thus reducing chances of cathodic reaction between these two members.
- B. Mechanical seals as described above shall be provided with 316 S.S. nuts, bolts and washers.
- C. Annulus shall be grouted on both sides after installation with hydraulic cement.

2.09 TEES

- A. Tees shall be the same diameter as the run of the pipe. They shall be of the same material as the sewer main.

2.10 LATERALS

- A. Shall be Ductile Iron Pipe conforming to paragraph 2.1-B, with push-on joints or Polyvinyl Chloride pipe with bells and natural rubber rings for jointing, conforming, to Paragraph 2.1-A, PVC Pipe.

2.11 STONE BACKFILL

- A. Shall be graded crushed granite with the following gradation:

Square Opening Size	Percent Passing
1"	100%
3/4"	90 to 100%
3/8"	0 to 65%
No. 4	0 to 25%

2.12 SAND BACKFILL

- A. Shall be clean sand free of clay and organic material. Not more than 10% shall pass the No. 100 sieve.

2.13 BORROW

- A. Where it is determined that sufficient suitable material is not available from the site to satisfactorily backfill the pipe to at least 2 feet above the top of the pipe, the Contractor shall furnish suitable sandy borrow material to accomplish the requirements. The materials shall have not more than 60% passing the No. 100 sieve, nor more than 20% passing the No. 200 sieve.

2.14 UNSUITABLE EXCAVATED MATERIAL

- A. All unsuitable excavated material must be properly disposed of in a manner acceptable to the City Public Works Department and in a manner that will not adversely affect the environment.

2.16 DETECTION WIRE

- A. Detection Wire shall be #14 gauge insulated single strand copper wire.

PART 3 – EXECUTION

3.01 ON-SITE OBSERVATION

- A. The Engineer shall have the right to require that any portion of the work be done in his presence and if any work is covered up after such instruction, it shall be exposed by the Contractor for observation. However, if the Contractor notifies the Engineer that such work is scheduled and the Engineer fails to appear within 48 hours, the Contractor may proceed without him. All work done and materials furnished shall be subject to review by the Engineer or Project Representative. All improper work shall be reconstructed and all materials which do not conform to the requirements of the specifications shall be removed from the work upon notice being received from the Engineer for the rejection of such materials. The Engineer shall have the right to mark rejected materials so as to distinguish them as such.

3.02 HANDLING MATERIALS

- A. Unloading: Furnish equipment and facilities for unloading, handling, distributing and storing pipe, fittings, valves and accessories. Make equipment available at

all times for use in unloading. Any cracked or damaged materials cannot be used and must be properly discarded.

- B. Handling: Handle pipe, fittings, valves and accessories carefully to prevent shock or damage. Handle pipe by rolling on skids, forklift, or front loader. Do not use material damaged in handling.
- C. Distribution: Distribute and place pipe and materials to not interfere with traffic. Do not string pipe more than 300 feet beyond the area where pipe is being laid. Do not obstruct drainage ditches.
- D. Storage: Store all pipe which cannot be distributed along the route. Make arrangements for the use of suitable storage areas. Do not interfere with other contractors right to access.

3.03 CONSTRUCTION ALONG HIGHWAYS, STREETS AND ROADWAYS

Install pipelines and accessories along highway, streets and roadways in accordance with the applicable regulations of the County, City and/or the Department of Transportation with reference to construction operations, safety, traffic control, road maintenance and repair.

- A. Protection of Traffic: Provide and maintain suitable signs, barricades and lights for protection of traffic.

Replace all highway signs removed for construction as soon as possible. Do not close or block any highway, street, or roadway without first obtaining permission from the proper authorities.

Provide flagmen to direct and expedite the flow of traffic.

- B. Construction Operations: Perform all work along highways, streets and roadways to least interfere with traffic.
 - 1. Stripping: Where the pipe line is laid along road shoulders, strip and stockpile all sod, topsoil and other material suitable for shoulder restoration.
 - 2. Trenching, Laying and Backfilling: Do not open the trench any further ahead of pipe laying operations than is necessary. Backfill and remove excess material immediately behind laying operations. Complete excavation and backfill for any portion of the trench in the same day.

3. Shaping: Reshape damaged slopes, side ditches, and ditch lines immediately after completing backfilling operations. Replace topsoil, sod and any other materials removed from shoulders.
- C. Excavated Materials: Do not place excavated material along highways, streets and roadways in a manner which obstructs traffic. Sweep all scattered excavated materials off of the pavements.
- D. Drainage Structures: Keep all side ditches, culverts, cross drains, and other drainage structures clear of excavated material and free to drain at all times.
- E. Maintaining Highways, Streets, Roadways and Driveways: Maintain streets, highways, and roadways in suitable condition for movement of traffic until completion and final acceptance of the work. Use steel running plate to maintain traffic until pavement is completed.

3.04 EXISTING UNDERGROUND UTILITIES AND OBSTRUCTIONS

- A. It is the responsibility of the Contractor to locate all existing utilities along the path of his construction. The drawings shall indicate underground utilities or obstructions that are known to exist. Where these or unforeseen underground utilities are encountered, the location and alignment of the watermain may be changed, upon written approval of the Engineer and Owner, to avoid interference.

3.05 CONNECTIONS TO EXISTING PIPE LINES

- A. Before laying pipe, the Contractor shall locate the points of connection to existing pipe lines and uncover as necessary for the Engineer and Owner to confirm the nature of the connections to be made. The Contractor shall furnish materials and make the connection to all existing pipelines. The Contractor will be observed during construction of tie-ins by the Owner and/or the Engineer. The Contractor shall use all available practices and resources to minimize the time the customers are without water.

3.06 PIPE DISTRIBUTION

- A. Pipe shall be distributed and placed in such a manner that will not interfere with traffic.
- B. No pipe shall be strung further along the route than 1,000 feet beyond the area in which the Contractor is actually working without written permission from the Owner and/or Engineer. The Owner and/or Engineer reserves the right to reduce this distance to a maximum distance of 200 feet in residential and

commercial areas based on the effects of the distribution to the adjacent property owners.

- C. No street or roadway may be closed for unloading of pipe without first obtaining permission from the proper authorities. The Contractor shall furnish and maintain proper warning signs and obstruction lights for the protection of traffic along highways, streets and roadways upon which pipe is distributed.
- D. No distributed pipe shall be placed inside drainage ditches.
- E. Distributed pipe shall be placed as far as possible from the roadway pavement, but no closer than five feet from the roadway pavement, as measured edge-to-edge.
- F. Contractor shall not excavate sanitary sewer trenches more than 400 feet in advance of pipe laying.
- G. Pipe distribution shall in no way, and shall under no circumstances, disturb wetlands (see Plans for Wetland Delineations).

3.07 LOCATION AND GRADE

- A. The Drawings show the alignment and grade of the gravity sewer and the position of manholes and other appurtenances. The slope shown on the gravity sewer profile and/or called for in the Specifications is the slope of the invert of the pipe.
- B. After the Contractor locates and marks the manhole centerlines or baselines of the gravity sewer, the Contractor shall perform clearing and grubbing.

3.08 LAYING AND JOINTING PIPE AND ACCESSORIES

- A. Lay all pipe and fittings to accurately conform to the lines and grades established by the construction drawings.
- B. Pipe Installation:
 - 1. Proper implements, tools and facilities shall be provided for the safe performance of the Work. All pipe, fittings and valves shall be lowered carefully into the trench by means of slings, ropes or other suitable tools or equipment in such a manner as to prevent damage to sewer materials and protective coatings and linings. Under no circumstances shall sewer materials be dropped or dumped into the trench.

2. All pipe, fittings, valves and other appurtenances shall be examined carefully for damage and other defects immediately before installation. Defective materials shall be marked and held for inspection by the Owner and/or Engineer, who may prescribe corrective repairs or reject the materials.
3. All lumps, blisters and excess coating shall be removed from the socket and plain ends of each pipe, and the outside of the plain end and the inside of the bell shall be wiped clean and dry and free from dirt, sand, grit or any foreign materials before the pipe is laid. No pipe which contains dirt shall be laid.
4. Foreign material shall be prevented from entering the pipe while it is being placed in the trench. No debris, tools, clothing or other materials shall be placed in the pipe at any time.
5. As each length of pipe is placed in the trench, the joint shall be assembled and the pipe brought to correct line and grade. The pipe shall be secured in place with approved backfill material.
6. It is common practice to lay pipe with the bells facing the direction in which work is progressing.
7. Applying pressure to the top of the pipe, such as with a backhoe bucket, to lower the pipe to the proper elevation or grade shall not be permitted.
8. Polyethylene Encasement: Installation shall be in accordance with AWWA C105 and the manufacturer's instructions. All ends shall be securely closed with tape and all damaged areas shall be completely repaired to the satisfaction of the Owner and/or Engineer.

C. Alignment and Gradient:

1. Lay pipe straight in alignment and gradient or follow true curves, where shown on the Drawings, as nearly as practicable. Do not deflect any joint more than the maximum deflection recommended by the manufacturer.
2. Maintain a transit, level and accessories on the job to lay out angles and ensure that deflection allowance are not exceeded.
3. The Contractor shall check the invert elevation at each manhole and the gravity sewer invert elevation at least three times daily, start, mid-day and end of day. Elevations shall be checked more frequently if more than

100 feet of pipe is installed in a day or if the gravity sewer is being constructed at minimum slope.

4. The Contractor shall check the horizontal alignment of the gravity sewer at the same schedule as for invert elevations.
 5. Should any installed pipe have its alignment, grade, or joints disturbed after placement, it shall be taken up and relaid.
- D. Expediting of Work: Excavate, lay the pipe, and backfill as closely together as possible. Do not leave unjointed pipe in the trench overnight. Backfill and compact the trench as soon as possible after laying and jointing is completed. Cover the exposed end of the installed pipe each day at the close of work and at all other times when work is not in progress. If necessary to backfill over the end of an uncompleted pipe or accessory, close the end with a suitable plug, either push-on, mechanical joint, restrained joint or as approved by the Owner and/or Engineer.
- E. Joint Assembly:
1. Push-on, mechanical, flange and restrained type joints shall be assembled in accordance with the manufacturer's recommendations.
 2. Each restrained joint shall be inspected by the Contractor to insure that it has been "homed" 100%.
- F. Cutting Pipe:
1. Cut ductile iron pipe using an abrasive wheel saw.
 2. Cut PVC pipe using a suitable saw.
 3. Remove all burrs and smooth the end before jointing.
 4. The Contractor shall cut the pipe and bevel the end, as necessary, to provide the correct length of pipe necessary for installing the fittings, valves, accessories and closure pieces in the correct location. Only push-on or mechanical joint pipe shall be cut.
- G. House Connections: Install wyes or tees in locations designated by the Owner and/or Engineer for future connection of service lines. Plug the branch of the wye or tee. Record the location of fittings installed on the Record Drawings.
- H. Valve, Fitting and Pressure Gauge Installation:

1. Prior to installation, valves shall be inspected for direction of opening, number of turns to open, freedom of operation, tightness of pressure-containing bolting and test plugs, cleanliness of valve ports and especially seating surfaces, handling damage and cracks. Defective valves shall be corrected or held for inspection by the Owner and/or Engineer. Valves shall be closed before being installed.
2. Valves, fittings, plugs and caps shall be set and joined to the pipe in the manner specified in this Section for cleaning, laying and joining pipe, except that 12-inch and larger valves shall be provided with special support, such as treated timbers, crushed stone, concrete pads or a sufficiently tamped trench bottom so that the pipe will not be required to support the weight of the valve.
3. A valve box shall be provided on each underground valve. They shall be carefully set, centered exactly over the operating nut and truly plumbed. The valve box shall not transmit shock or stress to the valve. The bottom flange of the lower belled portion of the box shall be placed below the valve operating nut. This flange shall be set on brick, so arranged that the weight of the valve box and superimposed loads will bear on the base and not on the valve or pipe. Extension stems shall be installed where depth of bury places the operating nut in excess of 30-inches beneath finished grade so as to set the top of the operating nut 30-inches below finished grade. The valve box cover shall be flush with the surface of the finished area or such other level as directed by the Owner and/or Engineer.
4. In no case shall valves be used to bring misaligned pipe into alignment during installation. Pipe shall be supported in such a manner as to prevent stress on the valve.

3.09 SEPARATION BETWEEN WATER & SANITARY SEWER

- A. Parallel separation shall be 10 feet horizontal between sanitary sewers and any existing or proposed water mains. Deviation may be authorized for closer installation provided that the sewer is laid in a separate trench such that the bottom of the water main is at least 18 inches above the top of the sewer. Sanitary sewers crossing water mains shall be laid to provide a minimum vertical distance of 18 inches of vertical clearance, both water and sewer line. Where there is less than 18 inches of vertical clearance, both water and sewer lines shall be ductile iron for one full length each side of the crossing with the water pipe joints located as far as possible from the sewer crossing.

3.10 VALVES AND APPURTENANCES

- A. All valves and appurtenances shall be installed in the locations shown, true to alignment and rigidly supported. Any damage to the above items shall be repaired to the satisfaction of the Engineer before they are installed.
- B. After installation, all valves and appurtenances shall be tested at least 2 hours at the working pressure corresponding to the class of pipe, unless a different test pressure is specified. If any point proves to be defective, it shall be repaired to the satisfaction of the Engineer.
- C. Flanged and mechanical joints under water or exposed to weather shall be made with type 316 stainless steel bolts, nuts and washers.
- D. Prior to assembly of split couplings, the grooves as well as other parts shall be thoroughly cleaned. The ends of the pipes and outside of the gaskets shall be moderately coated with petroleum jelly, cup grease, soft soap or graphite paste, and the gasket shall be slipped over one pipe end. After the other pipe has been brought to the correct position, the gasket shall be centered properly over the pipe ends with the lips against the pipes. The housing sections then shall be placed. After the bolts have been inserted, the nuts shall be tightened until the housing sections are firmly in contact, metal-to-metal, without excessive bolt tension.
- E. Prior to the installation of sleeve-type couplings, the pipe ends shall be cleaned thoroughly for a distance of 8 inches. Soapy water may be used as a gasket lubricant. A follower and gasket, in that order, shall be slipped over each pipe to a distance of about 6 inches from the end, and the middle ring shall be placed on the already laid pipe end until it is properly centered over the joint. The other pipe end shall be inserted into the middle ring and brought to proper position in relation to the pipe already laid. The gaskets and followers shall then be pressed evenly and firmly into the middle ring flares. After the bolts have been inserted and all nuts have been made up fingertight, diametrically opposite nuts shall be progressively and uniformly tightened all around the joint, preferably by use of a torque wrench of the appropriate size and torque for the bolts.
- F. Pressure gauges shall not be installed until after the substantial completion date unless otherwise requested by the Owner.

3.11 EXCAVATING, TRENCHING AND BACKFILLING

Refer to Section 02315

3.12 CONNECTION TO AN EXISTING MANHOLE

- A. Connection to an existing manhole shall be made by mechanically coring into the wall structure of the manhole. Cored opening shall be sized to properly accommodate a rubber boot seal as specified in this section.

3.13 CONNECTION AND REPAIRS TO AN EXISTING SEWER MAIN

- A. Where connections or repairs are required, Contractor shall only use solid sleeves and provide all materials and labor necessary to make the connection or repair to the existing pipeline, excluding service lines 6" or smaller.

3.14 CONCRETE COLLARS

- A. Construct collars as shown on the Drawings.

3.15 DETECTION WIRE & DETECTION TAPE

- A. Detection wire shall be provided over all non-ferrous pipe and properly connected to fittings and valves so that the pipeline may be located after burial. The wire should be buried one foot above the pipeline.
- B. The Contractor shall install a continuous run of plasticized metallic tape above the top of non-metallic pipe used for gravity sewer and force mains at approximately 30" below finished grade.
- C. In addition to the tape, the contractor shall install a continuous run of tracer wire attached to pipe. On pipe runs greater than 500', this tracer wire shall be attached to a 2" galvanized pipe with a 180 degree bend at top, extending 36" above grade for connection to locator equipment. The maximum distance between 2" pipe stubs shall be 500'.
- D. Detection Tape shall be suitable for detection with metal pipe location equipment, color coded, and labeled to identify contents of pipe and brightly colored to contrast with the soil.

3.16 THRUST RESTRAINT

- A. Provide restraint at all points where hydraulic thrust may develop.
- B. Retainer Glands: Provide retainer glands where shown on the Drawings and all associated fittings, valves and related piping. Retainer glands shall be installed in accordance with the manufacturer's recommendations, particularly, the required torque of the setscrews. The Contractor shall furnish a torque wrench

to verify the torque on all set screws which do not have inherent torque indicators.

- C. **Harnessing:** Provide harness rods only where specifically shown on the Drawings or directed by the Owner and/or Engineer. Harness rods shall be manufactured in accordance with ASTM A 36 and shall have an allowable tensile stress of no less than 22,000 psi. Harness rods shall be hot dip galvanized or field coated with bitumastic before backfilling. Where possible, harness rods shall be installed through the mechanical joint bolt holes. Where it is not possible, provide 90 degree bend eye bolts. Eye bolts shall be of the same diameter as specified in AWWA C111 for that pipe size. The eye shall be welded closed. Where eye bolts are used in conjunction with harness rods, an appropriate size washer shall be utilized with a nut on each end of the harness rod. Eye bolts shall be of the same material and coating as the harness rods.

- D. **Concrete Blocking:**
 - 5. Provide concrete blocking for all other bends, tees, valves, and other points where thrust may develop, except where other means of thrust restraint are specifically shown on the Drawings.

 - 6. Form and pour concrete blocking at fittings as shown on the Drawings and as directed by the Owner and/or Engineer. Pour blocking against undisturbed earth. Increase dimensions when required by over excavation.

- E. **Thrust Collars:** Collars shall be constructed as shown on the Drawings. Concrete and reinforcing steel shall meet the requirements specified in Article 2.03G of this Section. The welded-on collar shall be attached to the pipe by the pipe manufacturer.

3.17 INSPECTION AND TESTING

- A. Clean and flush lines prior to testing. Clean and test lines before requesting final acceptance. Where any obstruction is met, clean the sewers by means of rods, swabs or other instruments. When requested by the Owner and/or Engineer, flush out lines and manholes before final inspection.

- B. **Gravity Sewers:** Pipe lines shall be straight and show a uniform grade between manholes. Correct any discrepancies discovered during inspection.
 - 1. **Infiltration Tests:** When groundwater is more than two feet above the top of the pipe, provide infiltration testing in accordance with ASTM C

969, with the exception that leakage must be limited to 25 gallons/inch of pipe diameter/mile/day.

- a. Install suitable weirs in manholes selected by the Owner and/or Engineer to determine the leakage of ground water into the sewer. The maximum length of line for each infiltration test shall be 5,000 feet. Measure leakage only when all visible leaks have been repaired and the ground water is two feet above the top of the pipe. If leakage in any section of the sewer line exceeds 25 gallons/inch of pipe diameter/mile/day, locate and repair leaks. Repair methods must be approved by the Owner and/or Engineer. After repairs are completed, re-test for leakage.
- b. Furnish, install, and remove the necessary weirs, plugs, and bulkheads required to perform the leakage tests. Where continuous monitoring of flow level is required, the Owner and/or Engineer will provide and operate monitoring equipment.

2. Exfiltration Tests: Choose one of the following when groundwater is less than two feet above the top of the pipe.

- a. Hydrostatic Test: Provide testing in accordance with ASTM C 969, with the exception that leakage must be limited to 25 gallons/inch of pipe diameter/mile/day.
 1. Test pipe between manholes with a minimum of 10 feet hydrostatic pressure, measured at the center of the pipe at the upstream manhole.
 2. The ends of the pipe in the test section shall be closed with suitable watertight bulkheads. Inserted into the top of each bulkhead shall be a 2-inch pipe nipple with an elbow. At the upper end of the test section, a 12-inch riser pipe shall be connected to the 2-inch nipple. The test section of pipe shall be filled through the pipe connection in the lower bulkhead which shall be fitted with a valve, until all air is exhausted and until water overflows the riser pipe at the upper end.

Water may be introduced into the pipe 24 hours prior to the test period to allow complete saturation. House service lines, if installed, shall also be fitted with suitable bulkheads having provisions for the release of air while the test section is being filled with water.

3. During the test period, which shall extend over a period of two hours, water shall be introduced into the riser pipe from measured containers at such intervals as are necessary to maintain the water level at the top of the riser pipe. The total volume of water added during the test period shall not exceed 25 gallons/inch of pipe diameter/mile/day.

b. Low-Pressure Air Test:

1. Prior to air testing, the section of sewer between manholes shall be thoroughly cleaned and wetted. Immediately after cleaning or while the pipe is water soaked, the sewer shall be tested with low-pressure air. At the Contractor's option, sewers may be tested in lengths between manholes or in short sections (25 feet or less) using inflatable balls pulled through the line from manhole to manhole. Air shall be slowly supplied to the plugged sewer section until internal air pressure reaches approximately 4.0 psi. After this pressure is reached and the pressure allowed to stabilize (approximately two to five minutes), the pressure may be reduced to 3.5 psi before starting the test. If a 1.0 psi drop does not occur within the test time, then the line has passed the test. If the pressure drops more than 1.0 psi during the test time, the line is presumed to have failed the test, and the Contractor will be required to locate the failure, make necessary repairs, and retest the line. Minimum test time for various pipe sizes, in accordance with ASTM F 1417 is as follows:

Nominal Pipe Size (In)	Minimum Time (Min:Sec)	Length for Min Time (Ft)	Time for Longer Length
6	2:50	398	0.427L
8	3:47	298	0.760L
10	4:43	239	1.187L
12	5:40	199	1.709L
15	7:05	159	2.671L
18	8:30	133	3.846L
21	9:55	114	5.235L
24	11:20	99	6.837L

2. Required test equipment, including inflatable balls, braces, air hose, air source, timer, rotameter as applicable, cut-off valves, pressure reducing valve, 0-15 psi pressure gauge, 0-5 psi pressure gauge with gradations in 0.1 psi and accuracy of \pm two percent, shall be provided by the Contractor. Testing equipment shall be equal to Cherne Air-Loc Testing Systems.
3. The Contractor shall perform all tests in the presence of the Owner's Representative. Copies of all records will be given to the Engineer or the Owner. Such records shall show date, line number and stations, operator, and other such pertinent information as requested by the Engineer.
4. The Contractor is cautioned to observe proper safety precautions in performance of the air testing. It is imperative that plugs be properly secured and that care be exercised in their removal. Every precaution shall be taken to avoid the possibility of over-pressurizing the sewer line.

7. Deflection Test:

- a. Test PVC gravity sewer for excessive deflection by passing a mandrel through the pipe. Deflection of the pipe shall not exceed the following:

Nominal Pipe Diameter	Maximum Allowable Deflection
\leq 12-inches	5%
15 to 30-inches	4%
> 30-inches	3%

- b. The mandrel size shall be based upon the maximum possible inside diameter for the type of pipe being tested, taking into account the allowable manufacturing tolerances of the pipe. The mandrel shall have an odd number of legs, or vanes, with a quantity of such equal to or greater than nine. The legs of the mandrel shall be permanently attached to the mandrel. A mandrel with variable sizes shall not be allowed. The mandrel shall be constructed of steel aluminum or other material approved by the Owner and/or Engineer, and shall have sufficient rigidity so the legs of the mandrel will not deform when pulling

through a pipe. The mandrel dimensions shall be checked by the Owner and/or Engineer before use by the Contractor.

- c. Excavate and install properly any section of pipe not passing this test. Re-test until results are satisfactory.
 - d. The test shall be performed within the first 30 days of installation and during final inspection, at the completion of this contract.
 - e. The mandrel shall be performed in accordance with ASTM D 3034, F679, or 2122.
8. Closed Circuit Television: If deemed necessary by the Owner and/or Engineer, the interior of the gravity sewers shall be subjected to a televised inspection. Prior to Final Acceptance the Owner and/or Engineer shall be provided with one copy of the TV inspection report and video cassette showing the entire length of gravity sewer being tested. The report shall contain the condition of pipe, type of pipe, depth, location of services, length, type joint, roundness, and distance between manholes. Any pipe found to be cracked, leading, misaligned, bellied or otherwise defective shall be removed and replaced.
- C. Manholes: Prior to testing manholes for water tightness, all lift holes shall be plugged with a non-shrink grout, all joints between Precast sections shall be properly sealed and all pipe openings shall be temporarily plugged and properly braced. Each manhole shall pass one of the following tests:
- 1. Exfiltration Tests: The manhole, after proper preparation as noted above, shall be filled with water. The maximum allowable leakage shall be eight gallons per foot of depth per 24 hours for 48-inch diameter manholes. Tests shall last a minimum of eight hours. The manholes may be backfilled prior to testing.
 - 2. Vacuum Tests: Vacuum tests shall be performed in accordance with ASTM C 1244, *Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test*. The manhole, after proper preparation as noted above, shall be vacuum tested prior to backfilling. The test head shall be placed at the inside of the tope of the cone section and the compression head inflated to 40 psi to effect a seal between the vacuum base and the manhole structure. Connect the vacuum pump to the outlet port with the valve open. A vacuum of 10-inches of mercury shall be drawn and the vacuum pump shut off. With the valves closed, the time shall be measured for the vacuum to drop to 9-inches. The manhole shall pass if the time is greater than 60 seconds for 48-inch

diameter manholes. If the manhole fails the initial test, necessary repairs shall be made with non-shrink grout while the vacuum is still being drawn. Retesting shall proceed until a satisfactory test is obtained. Vacuum testing equipment shall be equal to that as manufactured by P.A. Glazier, Inc.

- D. Force Main: Hydrostatic and leakage testing for force mains shall conform to Section 4 of AWWA C600 with the exception that the Contractor shall furnish all gauges, meters, pressure pumps, and other equipment needed to test the line.
1. Required Pressure - The pressure required for the field hydrostatic pressure test shall be 150 pounds per square inch at the highest point in the section being tested.
 2. Duration of Test – The duration of each pressure test shall be two (2) hours.
 3. Procedures: Each valved section of pipe shall be slowly filled with water to the specified test pressure (measured at the highest point in the section being tested). Pressure shall be supplied by means of a pump connected to the pipe in a satisfactory manner. The pump, pipe connection, and all necessary apparatus, gauges, and meters shall be furnished by the Contractor. The Contractor shall furnish all necessary labor and assistance in conducting the tests. The Owner will furnish, through connections made by the Contractor to existing mains, water for filling the lines for making the test.
 4. Expelling Air Before Tests: 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 afterward tightly plugged.
 5. Examination Under Pressure: At intervals during the test (as determined by the Engineer), the route of the pipeline shall be inspected to locate any leaks or breaks. Any cracked or defective joints, cracked or defective pipe, fittings, or valves discovered in consequence of this pressure test shall be removed and replaced with sound material in the manner provided and the test shall be repeated until satisfactory results are obtained.
 6. Allowable Leakage: The amount of leakage which will be permitted shall be in accordance with AWWA C600 Standards for all pressure. Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe, of any valved section thereof, to maintain the specified

leakage test pressure after the pipe has been filled with water and the air in the pipeline has been expelled. No pipe installation shall be accepted if the leakage is greater than that determined by the following formula:

$$L = \frac{SD(P)^{1/2}}{133,200}$$

In which L is the allowable leakage in gallons per hour; S is the length of pipe tested, in feet; D is the nominal diameter of the pipe, in inches; and P is the average test pressure during the leakage test, in pounds per square inch gauge.

7. Testing Schedule: Contractor must submit his plan for testing to the Engineer for review at least ten (10) days before starting the test. The Contractor shall remove and adequately dispose of all blocking material and equipment after completion and acceptance of the field hydrostatic test, unless otherwise directed by the Engineer. Any damage to the pipe coating shall be repaired by the Contractor. Lines shall be totally free and clean prior to final acceptance.
- E. Re-Testing: Any alterations made to pipeline or manholes performed after initial testing shall be re-tested and pass again, regardless of initial test results.
- F. Notification: Owner and/or Engineer shall be notified 24-hours in advance prior to Contractor performing any testing.

3.18 PROTECTION AND RESTORATION OF WORK AREA

- A. General: Return all items and all areas disturbed, directly or indirectly by work under these Specifications, to their original condition or better, as quickly as possible after work is started.
 1. The Contractor shall plan, coordinate, and prosecute the work such that disruption to personal property and business is held to a practical minimum.
 2. All construction areas abutting lawns and yards of residential or commercial property shall be restored promptly. Backfilling of underground facilities, ditches, and disturbed areas shall be accomplished on a daily basis as work is completed. Finishing, dressing, and grassing shall be accomplished immediately thereafter, as a continuous operation within each area being constructed and with emphasis placed on completing each individual yard or business frontage.

Care shall be taken to provide positive drainage to avoid ponding or concentration of runoff.

3. Handwork, including raking and smoothing, shall be required to ensure that the removal of roots, sticks, rocks, and other debris is removed in order to provide a neat and pleasing appearance.
 4. The Department of Transportation's engineer shall be authorized to stop all work by the Contractor when restoration and cleanup are unsatisfactory and to require appropriate remedial measures.
- B. Man-Made Improvements: Protect, or remove and replace with the Owner and/or Engineer's approval, all fences, walkways, mail boxes, pipe lines, drain culverts, power and telephone lines and cables, property pins and other improvements that may be encountered in the work.
- C. Cultivated Growth: Do not disturb cultivated trees or shrubbery unless approved by the Owner and/or Engineer. Any such trees or shrubbery which must be removed shall be heeled in and replanted under the direction of an experienced nurseryman.
- D. Cutting of Trees: Do not cut trees for the performance of the work except as absolutely necessary. Protect trees that remain in the vicinity of the work from damage from equipment. Do not store spoil from excavation against the trunks. Remove excavated material stored over the root system of trees within 30 days to allow proper natural watering of the root system. Repair any damaged tree over 3-inches in diameter, not to be removed, under the direction of an experienced nurseryman. All trees and brush that require removal shall be promptly and completely removed from the work area and disposed of by the Contractor. No stumps, wood piles, or trash piles will be permitted on the work site.
- E. Disposal of Rubbish: Dispose of all materials cleared and grubbed during the construction of the project in accordance with the applicable codes and rules of the appropriate city and/or county, state and federal regulatory agencies.
- G. Swamps and Other Wetlands:
1. The Contractor shall not construct permanent roadbeds, berms, drainage structures or any other structures which alter the original topographic features within the easement.
 2. All temporary construction or alterations to the original topography will incorporate measures to prevent erosion into the surrounding swamp or

wetland. All areas within the easement shall be returned to their original topographic condition as soon as possible after work is completed in the area. All materials of construction and other non-native materials shall be disposed by the Contractor.

3. The Contractor shall provide temporary culverts or other drainage structures, as necessary, to permit the free migration of water between portions of a swamp, wetland or stream which may be temporarily divided by construction.
2. The Contractor shall not spread, discharge or dump any fuel oil, gasoline, pesticide, or any other pollutant to adjacent swamps or wetlands.

END OF SECTION

**SECTION 02741
REMOVAL AND REPLACEMENT OF EXISTING PAVEMENT**

PART 1 – GENERAL

1.01 SCOPE

- A. The Contractor shall furnish all labor, materials, equipment and incidental required to remove and replace existing pavements defined as Class “A” Pavement Replacement and Asphalt Patch as shown on the Drawings and as required for the construction of new pipelines and structures.
- B. The Contractor will be required to hose clean all road surfaces after backfilling and before any surfacing, but in no case will pavement be placed until the trench material is dry.
- C. The Contractor shall maintain pavement under this Contract during the guarantee period of one year and shall promptly refill and repave areas which have settled or are otherwise unsatisfactory for traffic.
- D. The Contractor shall furnish and spread calcium chloride on disturbed surfaces to allay dust conditions. Calcium chloride shall conform to AASHO M-144, except that the pellet or flake shall be equally acceptable.
- E. Permanent pavement shall be placed over a backfilled trench as soon as possible. Repaving may be delayed if the Engineer so directs, but in such case temporary pavement or crusher run placement shall be required.
- F. If, in the opinion of the Engineer, the placing of temporary pavement is necessary, the Contractor shall place the temporary pavement as described hereinafter.

1.02 RELATED WORK

- A. Not Applicable

1.03 SPECIFICATIONS

- A. Except as otherwise specified herein, the Standard Specifications for Highway Construction as issued by the State of Georgia, Department of Highways and Public Transportation, Section 400, shall apply to material requirements for

temporary and permanent replacement of pavements removed in excavation of trenches.

PART 2 PRODUCTS

2.01 CLASS "A" PAVEMENT REPLACEMENT (D.O.T. RIGHT-OF-WAY)

- A. Class "A" Pavement Replacement will consist of 8" of Class "A" Portland Cement Concrete over compacted subgrade with 2" of Type "E" asphaltic top coat that is equal or better than original paving. A bituminous tack coat must be applied before placement of asphaltic top coat.

2.02 ASPHALT REMOVAL & REPLACEMENT (CITY RIGHT-OF-WAY)

- A. An Asphalt Patch will consist of 6" of Class "A" Portland Cement Concrete over compacted subgrade with 1.5" of Type "E" asphaltic top coat that is equal or better than original paving. A bituminous tack coat must be applied before placement of asphaltic top coat.

2.03 TEMPORARY PAVEMENT

- A. Where directed by the Engineer, the Contractor shall place temporary pavement with top matching the grade of existing pavement. The material shall be 1-1/2" Asphaltic Concrete Surface Course.

PART 3 EXECUTION

3.01 CUTTING PAVEMENT

- A. The Contractor shall cut and remove pavement as necessary for installing the new pipe lines and appurtenances and for making connections to existing pipe lines.
- B. Before removing pavement, the pavement shall be marked for cuts nearly paralleling pipe lines and existing street lines. Asphalt pavement shall be cut along the markings with a rotary saw or other suitable tool. Concrete pavement, and asphalt pavement on concrete base, shall be scored to a depth approximately two (2) inches below the surface of the concrete along the pavement may be broken below the scoring with a jackhammer or other suitable equipment.

- C. No pavement shall be machine pulled until completely broken and separated along the marked cuts.
- D. The pavement adjacent to pipeline trenches shall neither be disturbed nor damaged. If the adjacent pavement is disturbed or damaged, irrespective of cause, the Contractor shall remove the damaged pavement and shall replace it at his own expense.
- E. No separate payment will be made for sawcutting as it shall be considered part of the pavement removal & replacement items.

3.02 HOT MIX ASPHALT PAVEMENT CONSTRUCTION, REPAIR AND REPLACEMENT

- A. All existing pavement cut or damaged by construction under this contract shall be repaired to match the original surface material and original grade unless otherwise specified or shown on the Drawings. Materials and construction procedures for base course and pavement repair shall conform to the GA DOT Specifications for the type of original surface.
- B. New pavements shall be placed at the locations as shown on the Drawings.
- C. The work for new or for repair of existing pavement shall include the placing and compacting of the base course, the placing of the Portland Cement Concrete at the thickness specified in the details, the application of prime and tack coats where required, the placing and maintaining of the hot mix asphalt surface course at the thickness specified in the details, and all special requirements specified herein.
- D. The backfill shall be thoroughly compacted prior to concrete base.
- E. The asphalt surface course shall be thoroughly rolled or tamped with a mechanical roller or tamper.

3.03 CONCRETE PAVEMENT

- A. Where the installation of pipe involves the cutting of concrete, the cutting shall be kept to a minimum. Once the pipe is installed, the Contractor shall compact the trench to 98% density according to the modified proctor. After compaction, Contractor shall install and compact a 6" thick graded aggregate base course. The base shall be poured and finished. Concrete shall be 3,000 psi and shall be equal or better than original pavement.
- B. When sidewalks are removed and replaced, match the existing finish and construct sidewalks as detailed on the plans.

3.04 CLEAN-UP & DISPOSAL OF CONSTRUCTION DEBRIS

- A. After all repair and restoration or paving has been completed, all excess asphalt, dirt, rock and other debris shall be removed from the roadways. All existing storm sewers and inlets shall be checked and cleaned of any construction debris.
- B. All concrete removed for construction must be stockpiled in a central location and crushed for future use by the City of Vidalia. Payment for crushing will be made from an allowance, but Contractor will be responsible for coordination with crushing subcontractor. All concrete will remain the property of the Owner.
- C. All asphalt removed for construction must be disposed of in a legally and lawfully operated C&D landfill with tickets provided to Engineer as proof of lawful disposal, or it may be recycled at an asphalt plant with a letter from the asphalt plant as proof of recycling.

3.05 MAINTENANCE OR REPAIR

- A. All wearing surfaces shall be maintained by the Contractor in good order and be suitable for traffic at all times for a period of one year after completion and acceptance of the work. Approximately at the end of the maintenance period a final inspection will be made of the repaired surface and any settlement or of the repaired surface and any settlement or depression shall be adjusted as previously noted herein.

END SECTION

**SECTION 02775
SIDEWALKS, DRIVEWAYS, AND CURBS & GUTTERS**

PART 1 – GENERAL

1.01 SCOPE

- A. The work included in this section includes furnishing all materials, equipment, and labor necessary to construct Portland Cement Concrete sidewalks, driveways, and curbs and gutters, as shown on the construction plans.

1.02 REFERENCES

- A. ACI031 – Specifications for Concrete Buildings.
- B. ACI304 – Recommended Practice for Measuring, Measuring, Mixing, Transporting, and Placing Concrete.
- C. ASTM A 185-94 – Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.
- D. ASTM A 497-94 – Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement.
- E. ASTM A 615-95 – Deformed and Plain Billet-Street Bars for Concrete Reinforcement.
- F. ASTM C 33-93 – Concrete Aggregates.
- G. ASTM C 39-94 – Compressive Strength of Cylindrical Concrete Specimens
- H. ASTM C 94-94 – Ready-Mixed Concrete.
- I. ASTM C 150-05 – Portland Cement
- J. ASTM C 260-94 – Air – Entraining Admixtures for Concrete.
- K. ASTM C 309-94 – Liquid Membrane – Forming Compounds for Curing Concrete.
- L. ASTM C 494-92 – Chemical Admixtures for Concrete
- M. ASTM D 1751-83 (1991) – Preformed Expansion Joint Filler for Concrete Paving and Structures Construction. (Nonextruding and Resilient Bituminous Type).

- N. ASTM D 1752-84 (1992) – Performed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.
- O. ASTM D 3740-94 – Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
- P. ASTM E 329-93 – Agencies Engaged in the Testing and/or Inspection of Materials used in construction.

1.03 REGULATORY REQUIREMENTS

- A. Perform work in accordance with the State of Georgia, City of Waycross, and the Department of Transportation, State of Georgia, Standard Specifications, Current Edition.
- B. Conform to applicable standards for paving work on public property.

1.04 TESTING

- A. Testing laboratory shall operate in accordance to ASTM D 3740 and E 329 and shall be accepted by the Engineer.
- B. The testing laboratory and Project Engineer/Project Representative shall be given a minimum of 48 hours notice prior to taking any of the tests.
- C. Testing shall be the responsibility of the Contractor and shall be performed at the Contractor's expense by a commercial testing laboratory that operates in accordance with subparagraph Number 1 above.
- D. The Contractor shall submit for review a design mix for "Class B" concrete proposed for use. The mix shall be prepared by an approved testing laboratory. Compressive strength of at least four (4) specimens of the design mix shall indicate 15% higher than 28 days strengths specified. During the work, the Contractor shall make 3 test cylinders for each 75 cubic yards, or fraction thereof, of concrete placed each day. One cylinder shall be tested at 7 days and the other two at 28 days in accordance with ASTM C-39. Copies of all test reports shall be furnished to the Engineer.

1.05 SUBMITTALS

- A. Product Data: Provide data on joint filler, admixtures, and curing compounds.

- B. Concrete Mix Design.

1.06 WEATHER CONDITIONS

- A. Do not place concrete when base surface temperature is less than 40° F, or surface is wet or frozen.

PART 2 – PRODUCTS

2.01 FORM MATERIALS

- A. Shall conform to ACI301.
- B. Shall be wood, plywood, metal or other accepted material and shall be of the grade or type suitable to obtain the finish specified. The material should be of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removed. Use straight forms, free of distortion and defects.
- C. Use flexible spring steel forms or laminated boards to form radius bends as required.
- D. Form Ties: Removable or snap-off type, galvanized metal, adjustable length, free of defects that could leave holes larger than 1-inch in concrete surface.
- E. Form Release Agent: Colorless mineral oil, which will not stain concrete, or absorb moisture, or impair natural bonding or color characteristics of coating intended for use on concrete.

2.02 REINFORCING STEEL

- A. Reinforcing Steel: ASTM A 615, Grade 60 billet steel deformed bars; uncoated finish.
- B. Welded Steel Wire Fabric: Plain type, ASTM A 185; uncoated finish.
- C. When specifically called for on the plans, reinforcing bars shall be epoxy-coated in accordance with ASTM A775.

2.03 CONCRETE MATERIALS

- A. Concrete Materials: "Class A" concrete as defined by the Standard Specifications of the Department of Transportation of Georgia.
- B. Fine and Coarse Mix Aggregates: ASSTM C33.
- C. Water: Potable; not detrimental to concrete.
- D. Air Entrainment: ASTM C260.

2.04 JOINT SEALERS

- A. Joint Fillers: [ASTM D1751] Asphalt impregnated fiberboard or felt, tongue and groove profile.
- B. Sealant: Joints shall be sealed per detail on project drawings. ASTM C 920-94, Type S or M, Grade P or NS, Class 25.

2.05 CONCRETE MIX - BY PERFORMANCE CRITERIA

- A. Concrete mixed at the job site shall be mixed in a batch mixer in accordance with American Concrete Institution Standard A.C.I 318, and in a similar manner subject to acceptance. Ready-mixed concrete shall conform to A.S.T.M. Standard C-94. Mixing time for stationary mixers over 1 cubic yard in capacity shall be increased 15 seconds for each additional ½ cubic yard or fraction thereof materials mixed. Construction shall be in accordance with applicable portions of "Building Code Requirements for Concrete" (A.C.I. – 318).
- B. Provide concrete to the following criteria:
 - 1. Flexural Strength: 700 psi
 - 2. Compressive Strength: 3,000 psi @ 28 days.
 - 3. Slump: 2 to 3 inches.
 - 4. Air Content: 4% to 8%.
- C. Use accelerating admixtures in cold weather only when approved by Engineer. Use of admixtures will not relax cold weather placement requirements.
- D. Use calcium chloride only approved by Engineer.

- E. Use set retarding admixtures during hot weather only when approved by Engineer.

2.06 SOURCE QUALITY CONTROL AND TEST

- A. All sampling and testing services shall be performed at the Contractor's expense, by a testing laboratory which operates in accordance with ASTM D 3740 and E 329 latest edition and accepted by the Engineer.
- B. The Contractor shall submit for review a design mix for each class of concrete proposed for use. The mix shall be prepared by an approved testing laboratory. Compressive strength of at least four specimens of the design mix shall indicate 15% higher than the 28-day strength specified. During the work, the Contractor shall make 3 test cylinders for each 30 cubic yards, or fraction thereof, of concrete placed each day. One cylinder shall be tested at 7 days and the other two at 28 days in accordance with ASTM C 39. Copies of all test reports shall be furnished to the Engineer in duplicate.

PART 3 – EXECUTION

3.01 CONSTRUCTION OBSERVATION

- A. Verify compacted subgrade & granular base are acceptable and ready to support paving and imposed loads.
- B. Verify gradients and elevations of base are correct.
- C. The Engineer will have the right to require that any portion of the work be done in his presence and if the work is covered up after such instruction, it shall be exposed by the Contractor for observation. However, if the Contractor notifies the Engineer that such work is scheduled, and the Engineer fails to appear within 48 hours, the Contractor may proceed without him. All work done and materials furnished shall be subject to review by the Engineer or Project Representative. Improper work shall be reconstructed. All materials, which do not conform to the requirements of the specifications, shall be removed from the work upon notice being received from the Engineer for the rejection of such materials. The Engineer shall have the right to mark rejected materials so as to distinguish them as such.

3.02 SUBBASE

- A. Prepare subbase in accordance with Section 300 - Standard Specifications for Base and Subbase Courses, Department of Transportation, State of Georgia, current Edition.
- B. Remove loose material from compacted subbase surface immediately before placing concrete.
- C. Proof-roll prepared subbase surface to check for unstable areas and need for additional compaction. Do not begin paving work until such conditions have been corrected and area is ready to receive paving.

3.03 PREPARATION FOR PLACEMENT

- A. Water shall be removed from excavations before concrete is deposited. Hardened concrete debris, and other foreign materials shall be removed from the interior of forms and from the inside of mixing and conveying equipment. The reinforcement shall be made secure in position and shall be subject to examination and acceptance.
- B. Moisten base to minimize absorption of water from fresh concrete.
- C. Notify Engineer minimum 48 hours prior to commencement of concreting operations.

3.04 FORMING

- A. Place and secure forms to correct location, dimension, profile, and gradient.
- B. Assemble formwork to permit easy stripping and dismantling without damaging concrete.
- C. Place joint filler in position, in straight lines. Secure to formwork during concrete placement.
- D. Forms shall be constructed to the shape, form line, and grade required and shall be maintained sufficiently rigid to prevent deformation under load. Formwork and details of construction shall conform to ACI-318, Chapter 6.
- E. Check completed formwork for grade and alignment to following tolerances:
 - 1. Top of forms not more than 1/8" in 10'.

2. Vertical face on longitudinal axis, not more than $\frac{1}{4}$ " in 10'.

3.05 REINFORCING

- A. Place Reinforcement as indicated.
- B. Interrupt reinforcement at expansion joints.

3.06 PLACING CONCRETE

- A. Placing of concrete shall conform to Chapter 5 of the American Concrete Institution Standard A.C.I. 318. Concrete having attained initial set or having contained water for more than 45 minutes shall not be used in the work. Concrete shall not be dropped freely more than 3 feet. Concrete shall be mixed and placed only when the temperature is at least 40 degrees F and rising. Concrete shall be placed only upon surfaces that are free from frost, ice, mud, and other detrimental circumstances. When placed on dry soil or previous materials, waterproof paper or polyethylene sheeting shall be laid over the surfaces that are to receive the concrete.
- B. Ensure reinforcement, inserts, embedded parts, and formed joints are not disturbed during concrete placement.
- C. Place concrete continuously over the full width of the panel and between predetermined construction joints. Do not break or interrupt successive pours such that cold joints occur.

3.07 JOINTS

- A. Place expansion joints at 25-foot intervals.
- B. Place joint filler between paving components and building or other appurtenances. Recess top of filler $\frac{1}{4}$ inch.
- C. Provide swan joints at 3 feet intervals between sidewalks and curbs.
- D. Saw cut contraction joints $\frac{1}{4}$ inch wide at an optimum time after finishing. Cut $\frac{2}{3}$ into depth of slab.
- E. Finishing: After striking-off and consolidating concrete, smooth surface by screeding and floating. Use hand methods only where mechanical floating is not possible. Adjust floating to compact surface and produce uniform texture.

After floating, test surface for trueness with a 10' straightedge. Distribute concrete as required to remove subsurface irregularities and refloat areas to provide a continuous smooth finish.

3.08 FINISHING

- A. Concrete Finishing: After striking-off and consolidating concrete, smooth surface by screeding and floating. Use hand methods only where mechanical floating is not possible. Adjust floating to compact surface and produce uniform texture.
- B. After floating, test surface for trueness with a 10' straightedge. Distribute concrete as required to remove surface irregularities and refloat repaired areas to provide a continuous smooth finish.
- C. Work edges of gutters, back top edge of curb, and formed joints with an edging tool, and round to $\frac{1}{4}$ " radius, unless otherwise indicated. Eliminate tool marks on concrete surface.
- D. Do not remove forms for 24 hours after concrete has been placed. After form removal, clean ends of joints and point-up any minor honeycombed areas. Remove and replace areas or sections with major defects, as directed by Engineer.

3.09 CONCRETE CURING

- A. Immediately after placement and finishing, concrete shall be protected from moisture loss for not less than 7 days. For concrete surfaces not in contact with forms, white-pigmented curing compound shall be uniformly applied after water sheen disappears from the concrete surface. Formed surfaces shall receive and application of curing compound if forms are removed during the 7-day curing period. Curing compound shall not be applied during rainfall.
- B. Curing compound shall be applied under pressure at the rate of 1 gallon to not more than 150 square feet by mechanical sprayers. The spraying equipment shall be of the fully atomizing type. At the time of use, the compound shall be thoroughly mixed with white pigments uniformly dispersed throughout the sprayer. Care shall be taken to prevent application to joints where concrete bond is required, to reinforcements steel and to joints where joint sealer is to be placed. The compound shall form a uniform continuous coherent film that will not crack or peel and shall be free from pinholes and other imperfections. Concrete surfaces that are subjected to heavy rainfall within 3 hours after curing compound has been applied shall be resprayed by the above method and at the above coverage at no additional expense to the Owner.

- C. No pedestrian or vehicular traffic shall be allowed over the surface for seven days unless the surface is protected by planks, plywood, or sand. The protection shall not be placed until at least 12 hours after the application of the curing compound.
- D. Protect concrete by suitable methods to prevent damage by mechanical injury or excessively hot or cold temperatures.

3.10 FIELD QUALITY CONTROL

- A. Three concrete cylinders will be taken every 75 cubic yards of concrete placed each day.
- B. One additional test cylinder will be taken during cold weather and cured on site under same conditions as concrete it represents.
- C. One slump test will be taken for each set of test cylinders taken.
- D. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

3.11 PROTECTION

- A. Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury.
- B. Repair or replace broken or defective concrete, as directed by Engineer.
- C. Allow testing company to drill test cores where directed by Engineer, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with Portland cement concrete bonded to pavement with epoxy adhesive.
- D. Protect concrete from damage until acceptance of work. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.
- E. Sweep concrete curb and gutter and wash free of stains, discolorations, dirt, and other foreign material just prior to final inspection.

END OF SECTION

SECTION 02821
CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.1 SCOPE

Work under this section shall include:

- A. Polymer coated (black) galvanized steel chain link fence and gates.

1.3 RELATED SECTIONS

- A. Section 02200 - Earthwork & Site Grading

1.4 SUBMITTALS

- A. Product Data in the form of manufacturer's technical data, specifications, and installation instructions for fence and gateposts, fabric, gates, operators, and accessories.
- B. Shop Drawings showing location of fence, gates, each post, and details of post installation, extension arms, gate swing, hardware, and accessories.

1.5 QUALITY ASSURANCE

- A. Single-Source Responsibility: Obtain chain link fences and gates as complete units, including necessary erection accessories, fittings, and fastenings from a single source or manufacturer.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify layout information for fences and gates shown on the Drawings in relation to the property survey and existing structures. Verify dimensions by field measurements.

PART 2 - PRODUCT

2.1 FABRIC

- A. Selvage: Fabric shall be knuckled at one selvage and twisted at the other; all mesh 60 inches high and under shall be knuckled at both selvages.
- B. Steel Chain-Link Fence Fabric: Fabricated in one-piece widths for fencing 12 feet and less in height to comply with Chain Link Fence Manufacturers Institute (CLFMI) "Product Manual" and with requirements indicated below:
- C. Fencing Mesh and Wire Schedule:
 - 1. 2-inch mesh, 0.148-inch diameter (9 gage) fencing to be used for all fencing.
- D. Fabric shall be mounted on the security side. Verify with Owner.

2.2 FINISHES

- A. Fabric: Not less than 1.2 oz. zinc per square foot.
- B. Framing: Not less than 1.8 oz. zinc per square foot.
- C. Polymer Coating: POLYMER/VINYL COATED FABRIC AND FRAMING shall be thermally fused polymer/vinyl coated steel chain link fabric shall be furnished in accordance with ASTM F-668, Type 2B. The core wire and break load will determine the gauge of the wire. The steel core wire shall be galvanized in accordance with ASTM A-641-71A. The color shall be black. All steel framing and accessories shall be vinyl coated. All steel framing and accessories shall be hot-dipped galvanized per ASTM prior to vinyl coating. Thickness of vinyl coating shall be 10-14 mills applied by fusion bonding.

2.3 FRAMING

- A. Round member sizes are given in actual outside diameter (OD) to the nearest thousandth of inches. Round fence posts and rails are often referred to in ASTM standard specifications by nominal pipe sizes (NPS) or the equivalent trade sizes in inches. The following indicates these equivalents all measured in inches:
- B. Strength requirements for posts and rails conforming to ASTM F 669. Pipe shall be straight, true to section, material, and sizes specified, and shall conform to the following weights per foot:

NPS in Inches	Outside Diameter (OD) in inches	Type I Steel	Type II Steel
1	1.315	1.68	1.35
1-1/4	1.660	2.27	1.84
1-1/2	1.900	2.72	2.28
2	2.375	3.65	3.12
2-1/2	2.875	5.79	4.64
3	3.500	7.58	5.71
3-1/2	4.000	9.11	6.56
4	4.500	10.79	_____
6	6.625	18.97	_____
8	8.625	28.55	_____

C. Steel Framework, General: Posts, rails, braces, and gate frames.

1. Type I Round Posts: Hot-dipped galvanized steel pipe conforming to ASTM F 1083, plain ends, standard weight (schedule 40) with not less than 1.8 oz. zinc per sq. ft. of surface area coated.
2. Type II Round Posts: Manufactured from steel conforming to ASTM A 569 or A 446, grade D, cold formed, electric welded with minimum yield strength of 50,000 psi and triple coated with minimum 0.9 oz. zinc per sq. ft. after welding, a chromate conversion coating and a clear polymer overcoat. Corrosion protection on inside surfaces shall protect the metal from corrosion when subjected to the salt spray test of ASTM B 117 for 300 hours with the end point of 5 percent Red Rust.

D. Roll-Formed Steel Shapes: C-sections, produced from structural steel conforming to ASTM A570, Grade D. Comply with ASTM F 1043, Material Design Group II, with minimum yield strength of 45,000 psi (310 MPa); and the following coating requirements:

1. Coating: Type A, consisting of not less than minimum 2.0-oz./sq. ft. (0.61-kg/sq-m) average zinc coating per ASTM A

123/A 123M or 4.0-oz./sq. ft. (1.22-kg/sq-m) zinc coating per ASTM A 653/A653M.

- E. Steel posts for fabric heights up to 6 feet:
 - 1. End, Corner, and Pull Post
 - a. Up to 6 feet: 2.875 inch OD Type I or II steel pipe.
 - 2. Line or Intermediate Posts
 - a. Up to 6 feet: 2.375 inch OD Type I or II steel pipe or rolled-formed steel C-section equivalent.

- F. Steel posts for fabric heights over 6 and not exceeding 12':
 - 1. End, Corner, and Pull Post
 - a. 2.875 OD Type I or II
 - 2. Line or Intermediate Post
 - b. 2.375 OD Type I or II or rolled-formed steel C-section equivalent.

- G. Swing Gate Posts: Furnish posts to support single gate leaf, or one leaf of a double-gate installation, according to ASTM F 900, sized as follows for steel and aluminum pipe posts:
 - 1. Steel posts for fabric height of 6 feet or less and gate leaf width:
 - a. Over 4 to 8 Feet: 3.50-inch OD pipe weighing at least 5.71 lb per ft.
 - b. Over 8 to 16 Feet: 4.50-inch OD pipe weighing at least 10.79 lb. per ft.

- H. Top Rail: Manufacturer's longest lengths (17 to 21 feet) with swedged-end or expansion-type coupling, approximately 6 inches long for joining. Provide rail ends or other means for attaching top rail securely to each gate corner, pull, and end post.
 - 1. Round Steel: 1.66" OD Type I or II steel pipe or rolled formed steel 1.625"x 1.25" channel-shaped top rail.

- I. Center and intermediate rails, where required, shall be the same as toprail.

2.4 FITTINGS AND ACCESSORIES

- A. Material: Comply with ASTM F 626. Mill-finished aluminum or galvanized iron or steel to suit manufacturer's standards.

1. Steel and Iron: Unless specified otherwise, hot-dip galvanize pressed steel or cast-iron fence fittings and accessories with at least 1.2 oz. zinc per sq. ft. as determined by ASTM A 90.
 2. Aluminum: Die cast conforming to ASTM B 26, aluminum-alloy 360 or sand cast conforming to ASTM B 85, aluminum-alloy 365, ZG61A, or Tenzaloy.
- B. Tie Wires: 12 gage (0.106 inch diameter) galvanized steel with a minimum of 0.80 oz. per sq. ft. of zinc coating of surface area in accordance with ASTM A 641, Class 3 or 9 gage (0.106 inch diameter) aluminum wire alloy 1100-H14 or equal, to match fabric core material.
- C. Post Brace Assembly: Manufacturer's standard adjustable brace at end and gate posts and at both sides of corner and pull posts, with horizontal brace located at mid-height of fabric. Use same material as top rail for brace, and truss to line posts with 3/8-inch diameter rod and adjustable tightener. Provide manufacturers standard galvanized steel or cast iron or cast aluminum cap for each end.
- D. Post and Line Caps: Provide weather tight closure cap for each post. Provide line post caps with loop to receive top rail.
- E. Tension or Stretcher Bars: Hot-dip galvanized steel with minimum length 2 inches less than full height of fabric, minimum cross-section of 3/16 inch by 3/4 inch and minimum 1.2 oz. zinc coating per sq. ft. of surface area. Provide one bar for each gate and end post, and two for each corner and pull post, except where fabric is integrally woven into post.
- F. Tension and Brace Bands: Minimum 3/4-inch wide hot-dip galvanized steel with minimum 1.2 oz. zinc coating per sq. ft. of surface area.
1. Tension Bands: Minimum 14 gage (0.074 inch) thick.
 2. Tension and Brace Bands: Minimum 12 gage (0.105 inch) thick.
- G. Concrete: Provide concrete consisting of Portland cement, ASTM C 150, aggregates ASTM C 33, and clean water. Mix materials to obtain concrete with a minimum 28-day compressive strength of 2500 psi. Use at least 4 sacks of cement per cu. yd., 1-inch maximum size aggregate, maximum 3-inch slump, and 2 to 4 percent entrained air.

- H. Tension Wire: 7 gage steel, metallic-coated coil spring wire, in accordance with ASTM A824, located at bottom of all fencing.

2.5 GATES

- A. Fabrication: Fabricate perimeter frames of gates from metal and finish to match fence framework. Assemble gate frames by welding. Provide horizontal and vertical members to ensure proper gate operation and attachment of fabric, hardware, and accessories. Space frame members maximum of 8 feet apart unless otherwise indicated.
1. Provide same fabric as for fence unless otherwise indicated. Install fabric with tension bars and bands at vertical edges and with tie wires at top and bottom edges.
 2. Install diagonal cross-bracing consisting of 3/8 inch-diameter adjustable-length truss rods on gates to ensure frame rigidity without sag or twist.
- B. Swing Gates: Comply with ASTM F 900.
1. Steel: Gates up to 8 feet wide.
 2. Up to 6 feet high: Fabricate perimeter frames of minimum 1.66-inch OD Type I or II steel pipe or 1.90" OD tubular shaped steel.
 3. Swing Gate Hardware: Provide hardware and accessories for each gate, galvanized per ASTM A 153, and in accordance with the following:
 - a. Hinges: Size and material to suit gate size, non-lift-off type, offset to permit 180-deg gate opening. Provide 1-1/2 pair of hinges for each leaf over 6-foot nominal height.
 - b. Latch: Forked type or plunger-bar type to permit operation from either side of gate, with padlock eye as integral part of latch.
 - c. Keeper: Provide keeper for gates, which automatically engages gate leaf and holds it in open position until manually released.
 - d. Gate Stops: Provide gate stops for the double gates, consisting of mushroom-type flush plate with anchors, set in concrete and designed to engage center drop rod or plunger bar. Include locking device and padlock eyes as integral part of latch, permitting both gate leaves to be locked with single padlock.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. General: Install fence in compliance with ASTM F 567. Do not begin installation and erection before final clearing and grading is completed, unless otherwise permitted. Install fabric with knuckled edge up and twisted edge at bottom where applicable.
- B. Excavation: Drill or hand-excavate (using post-hole digger) holes for posts to diameters and spacings indicated in firm, undisturbed, or compacted soil.
 - 1. If not indicated on drawings, excavate holes for each post to minimum diameter recommended by fence manufacturer, but not less than 4 times largest cross-section of post.
 - 2. Unless otherwise indicated, excavate hole depths approximately 3 inches lower than post bottom, with bottom of posts set not less than 36 inches below finish grade surface.
- C. Setting Posts: Center and align posts in holes 3 inches above bottom of excavation. Space maximum 10 feet O.C., unless otherwise indicated.
 - 1. Protect portion of posts above ground from concrete splatter. Place concrete around posts and vibrate or tamp for consolidation. Check each post for vertical and top alignment and hold in position during placement and finishing operations.
 - a. Unless otherwise indicated, extend concrete footings 2 inches above grade and trowel to a crown to shed water.
- D. Top Rails: Run rail continuously through line post caps, bending to radius for curved runs and at other posts terminating into rail end attached to posts or post caps fabricated to receive rail. Provide expansion couplings as recommended by fencing manufacturer.
- E. Brace Assemblies: Install braces at end and gateposts and at both sides of corner and pull posts. Locate horizontal braces at mid height of fabric on fences with top rail and at two-thirds fabric height on fences without top rail. Install so posts are plumb when diagonal rod is under proper tension.

- F. Fabric: Leave approximately 1 inch between finish grade and bottom selvage unless otherwise indicated. Pull fabric taut and tie to post, rails, and tension wires. Install fabric and anchor to framework so that fabric remains in tension after pulling force is released. Install fabric to sides of fence posts as follows:
1. Mechanical Yards: Exterior of mechanical yards
 2. Stormwater Ponds: Exterior of pond
- G. Tension or Stretcher Bars: Thread through or clamp to fabric 4 inches O.C., and secure to end, corner, pull, and gate posts with tension bands spaced not over 15 inches O.C.
- H. Tie Wires: Use U-shaped wire of proper length to secure fabric firmly to posts and rails with ends twisted at least 2 full turns. Bend ends of wire to minimize hazard to persons or clothing.
1. Maximum Spacing: Tie fabric to line posts 12 inches O.C. and to rails and braces 24 inches O.C. Tie fabric to gate frames 6" O.C.
- I. Fasteners: Install nuts for tension bands and hardware bolts on side of fence opposite fabric side. Peen ends of bolts or score threads to prevent removal of nuts.
- J. Tension Wire: Thread tension wire through bottom of fabric, pull taut and secure wire to post.

3.2 GATE INSTALLATION

- A. Gates: Install gates plumb, level, and secure for full opening without interference. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation and lubricate where necessary.

END OF SECTION

SECTION 02920
PERMANENT (PERENNIAL) GRASSING AND LANDSCAPING

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Preparation of ground surface; furnishing and application of lime, fertilizer, seed, and mulch to establish a stand of permanent, mowable grass on all disturbed areas; and placement of all disturbed shrubs, trees, and miscellaneous plants.
- B. Seed Protection.
- C. Maintenance of seeded areas until final acceptance.

1.02 RELATED SECTIONS

- A. Section 02370 – Soil Erosion and Sedimentation Control

1.03 REFERENCES

- A. “Standard Specifications, Construction of Roads and Bridges” Section 700 and 702;1993 Edition; published by the Georgia Department of Transportation; hereinafter referred to as the “Standard Specifications.”
- B. “Manual for Erosion and Sediment Control in Georgia” published by the State Soil and Water Conservation Commission of Georgia; hereinafter referred to as the “Manual”. Contractor shall be responsible for the acquisition and utilization of the latest edition of the “Manual for Erosion and Sediment Control in Georgia”.

1.04 SUBMITTALS

- A. Contractor shall submit list of grasses, lime, fertilizer, seeding and mulching rates; and seeding dates for Engineer’s review and approval prior to seeding.

1.05 DEFINITIONS

- A. Final Stabilization: All soil disturbing activities at the site have been completed, and that for unpaved areas and areas not covered by permanent structures, at least 70% of the soil surface is uniformly covered in permanent vegetation or equivalent permanent stabilization measures (such as the use of rip rap, gabions, permanent mulches, or geotextiles) have been employed.

- B. Land-Disturbing Activity: Any activity which may result in soil erosion from water or wind and the movement of sediments into State waters or onto lands within the State, including, but not limited to clearing, grubbing, dredging, grading, excavating, transporting, and filling.
- C. Rolled Erosion Control Blanket (RECB): A temporary blanket consisting of degradable plastic netting that covers and is intertwined with a natural organic or manmade mulch; or, a jute mesh that is typically homogenous in design.
- D. Soil Reinforcement Matting: A permanent non-degradable, three dimensional plastic structure which can be filled with soil prior to planting; also known as turf reinforcement matting.

PART 2 – PRODUCTS

2.01 FERTILIZER AND LIME

- A. Fertilizer: Standard commercial grade grass fertilizer with a 10-10-10 (N-P-K) proportion.
- B. Lime: Natural, agricultural grade, ground or pulverized dolomitic limestone.

2.02 MULCH

- A. Dry straw, hay, or wood cellulose fiber of good quality, free of weeds and foreign matter detrimental to plant life.

2.03 GRASS SEED

- A. All grass seed shall be certified by the Georgia Department of Agriculture.
- B. All grass seed shall be in undamaged containers showing percentage of seed mix, year of production, net weight, date of packaging, and location of packaging.
- C. Selected grasses shall be appropriate for the season and site as specified by the Manual.
- D. Selected seed shall be equal type and grade to the previously existing grass.
- E. The Engineer reserves the right to test, reject, or accept all seed before seeding.

2.04 BLANKETS AND MATTING

- A. All blanket and matting materials used shall be on the Georgia Department of Transportation Qualified Products List (QPL #62 for blankets, QPL #49 for matting).

2.05 SOD

- A. Sod shall be densely rooted, good quality grass, free from noxious weeds, and appropriate for the region it is to be planted.
- B. The sod shall contain practically all of the dense root system and not be less than one (1) inch thick.
- C. Sod shall be cut in uniform strips not less than twelve (12) inches in width and not less than twenty-four (24) inches in length.

2.06 TREES, SHRUBBERY, AND MISCELLANEOUS PLANTS

- A. All trees or shrubbery damaged by the Work shall be replaced with identical plants of the same general size and quality as previously existed.

2.07 PRODUCT REVIEW

- A. The Contractor shall provide the Engineer with a complete description of all products before ordering. The Engineer will review all products before they are ordered.

PART 3 – EXECUTION

3.01 GENERAL

- A. All areas that are disturbed by the Work, including trenches and ungraded cleared areas, except areas to be paved, shall be provided with a full stand of permanent grass.
- B. Concentrated flow areas, all slopes steeper than 2.5:1 and with a height of ten feet or greater, and cuts and fills within stream buffers, shall be stabilized with sod and/or the appropriate erosion control matting or blanket. Appropriate matting or blankets shall be specified by the Engineer on the Drawings.

- C. Where sod is required to match existing conditions, the Contractor shall install sod. No separate payment will be made for sod as it will be considered a part of the final grassing bid item. Contractor will also be required to water sod until it is established.
- D. **Important Note: The Contractor is expected to provide a full coverage of permanent grass before the project will be deemed complete. Substantial retainage will be withheld if the Contractor is not preparing seed bed, seeding, and watering throughout the project to ensure a substantial stand at project completion.**

3.02 PREPARATION

- A. Remove foreign materials, plants, roots, stones, and debris from surfaces to be seeded so that they are made smooth, uniform, and conform to the adjacent ground surface.
- B. Crusted soils shall be loosened to a minimum depth of 3 inches before fertilizer, lime, seed, or sod is applied.
- C. Apply fertilizer uniformly at a rate of 1,500 lbs./acre (35 lbs./1000 sq. ft.) unless otherwise directed by the Engineer.
- D. Apply lime uniformly at the rate of 2,000 lbs./acre (45 lbs./1000 sq. ft.) unless otherwise directed by the Engineer.
- E. Thoroughly mix lime and fertilizer with the first 2 to 4 inches of the soil.
- F. Roll to form a smooth, firm seedbed.

3.03 SEEDING

- A. Include both temporary and permanent (perennial) grasses in all seeding of permanent grass. For additional information regarding permanent (perennial) grassing or for mixtures with temporary grassing or other perennial grasses, see Chapter 6, Section II of the Manual.
- B. Apply seed evenly on freshly prepared and rolled seedbed with a cyclone seeder, drill, cultipacker seeder, or hydroseeder.
- C. Certified grass seed shall be applied at the rates and dates indicated in the following table:

Species	Rate Per 1,000	Rate Per Acre	PLANTING DATES
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	Sq. Ft.		Mountains Limestone Valley	Piedmont	Coastal
Bermuda, Hulled	0.2 lb.	10 lbs.	-----	4/1 – 5/31	3/15 – 5/31
Bermuda, Unhulled	0.2 lb.	10 lbs.	-----	10/15 – 2/28	11/1 – 1/31
Bermuda, Sprigs	0.9 cu. ft.	40 cu. ft.		4/1 – 6/15	4/1 – 5/31
	Sod plugs 3 ft. x 3 ft.				
Crown Vetch	0.3 lb.	15 lbs.	9/1 – 10/15	9/1 – 10/15	-----
Fescue, Tall	1.1 lbs.	50 lbs.	3/1 – 4/1 or 8/15 – 9/30	8/15 – 10/15 or 2/15 – 4/15	-----
Sericea Lespedeza, Scarified	1.4 lbs.	60 lbs.	4/1 – 5/31	3/15 – 5/31	3/1 – 5/15
Sericea Lespedeza, Unscarified	1.7 lbs.	75 lbs.	9/21 – 2/28	9/1 – 2/28	9/1 – 2/28
Weeping Lovegrass	0.1 lb	4 lbs.	4/1 – 5/31	3/15 – 5/31	3/1 – 5/31

PLEASE NOTE: The preceding grassing schedule indicated optimal planting dates. However, this schedule may be expanded by several weeks to indicate a permissible, but marginal, planting period.

- D. Cover seeds lightly with soil using a rake or cultipacker. On steep slopes, cover seeds by dragging spiked chains or other satisfactory method.

3.04 MULCHING

- A. Immediately apply mulch to all seeded areas that do not require matting or blankets.
- B. Apply mulch in accordance with Chapter 6, Section II of the Manual.
- C. Uniformly apply mulch so as to provide a 75% soil cover.
- D. Anchor all mulch. Acceptable anchoring methods include using a disk harrow, commercial tackifier, or netting with openings not exceeding the average size of the mulching material.

3.05 BLANKETS AND MATTING

- A. Contractor shall install blankets or matting according to manufacturer's specifications.

3.06 SODDING

- A. Sod shall be placed within 48 hours of cutting.
- B. Sod shall be moist when laid and placed on moist ground. Place sod by hand, beginning at the toe of slopes and working upwards. The length of the strips shall be perpendicular to the flow of surface water. All joints shall be tightly butted and end joints shall be staggered at least 12 inches. The sod shall be immediately pressed firmly into the ground by tamping or rolling. Fill all joints between strips with fine-screened soil.
- C. Anchor sod on slopes steeper than 3:1 with sod pegs or other approved method.

3.07 SHRUBBERY, TREES, AND MISCELLANEOUS PLANTS

- A. Plant shrubbery and trees in accordance with written recommendations of nursery supplying the plants, including mulching, fertilizing, and watering instructions.
- B. Provide an approved written guarantee from nursery for all transplanted shrubbery and trees for one year after final acceptance. Guarantee shall provide that failed plants be replaced. Guarantee shall provide for mulching, fertilizing and watering of replaced plants and shall extend the guarantee for one year from date of replacement.

3.08 WATERING

- A. Apply water with fine spray immediately after each area has been sown.
- B. Provide water as necessary to achieve final stabilization.

3.09 MAINTENANCE

- A. Maintenance shall consist of providing protection against traffic, watering to ensure uniform seed germination and to keep surface of soil damp, and repairing any areas damaged as a result of construction operations or erosion.
- B. If a poor stand of grass is present, re-seed as required to achieve final stabilization. Replace sod as needed.

- C. Control erosion at all times. Where damage occurs, repair landscaping work as quickly as practicable.
- D. After grass has been established, mow as often as needed to maintain height between 4 and 6 inches until final acceptance.

3.10 ACCEPTANCE

- A. Prior to acceptance, the Contractor shall produce a stand of perennial grass that has fully achieved “final stabilization” as defined in the latest edition of “The Manual for Erosion and Sediment Control in Georgia” and the NPDES General Permit for Stormwater Discharges Associated with Construction Activity.

END OF SECTION

**SECTION 03480
PRECAST STRUCTURES**

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Rectangular, monolithic, or sectional precast water and wastewater structures, pipe connectors, and accessories for lift station site.

1.02 REFERENCES

- A. Prestressed Concrete Institute: Manual for Quality Control for Plants and Production of Precast and Prestressed Concrete Products.
- B. National Precast Concrete Association: Quality Control Manual for Precast Concrete Plants.
- C. American Society for Testing and Materials:
 - 1. ASTM C478 - Standard Specification for Precast Reinforced Concrete Manhole Sections.
 - 2. ASTM C890 - Standard Practice for Minimum Structural Design Loading for Monolithic or Sectional Precast Concrete Water and Wastewater Structures.
 - 3. ASTM C891 - Standard Practice for Installation of Underground Precast Concrete Utility Structures.
 - 4. ASTM C923 - Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals.
 - 5. ASTM C913 - Standard Specifications for Precast Concrete Water and Wastewater Structures.
- D. American Association of State Highway and Transportation Officials Standard Specification for Joints for Circular Concrete Sewer and Culvert Pipe Using Flexible Watertight Gaskets (AASHTO M198).
- E. American Concrete Institute Building Code Requirements for Reinforced Concrete (ACI 318).
- F. Occupational Safety and Health Administration Standard 1926.704 – Requirements for Precast Concrete.

1.03 SUBMITTALS

- A. Schedule of precast concrete structure sections to be provided on the project, charting the following:
1. Sheet number where the precast structure plan & profile is shown on the plans.
 2. Line number (when there is more than one line on the project).
 3. Precast Structure Station number.
 4. Invert Elevation of the influent and effluent line as indicated on the plans.
 5. Top Elevation of the precast structure frame as indicated on the plans.
 6. Top elevation of precast structure base slab as calculated.
 7. Total height of precast structure required from top of base slab to top of frame.
 8. Total height of assembled base, risers and cone or top provided from top of base to top of top.
 9. Manufacturer's Part No. or Catalogue No. and number required of each base, riser, and top provided for the precast structure.
 10. Each Pipe size and type and its Connector's, Part No., distance from top of base slab, and horizontal distances from inner wall corners of precast structure.
- B. Detail of each precast concrete structure to be provided, sealed by the Registered Professional Engineer employed by the manufacturer showing or charting the following:
1. Manufacturer's Part No. or Catalogue No.
 2. Inside Dimensions
 3. Lay Length excluding base slab
 4. Wall thickness and base or top thickness where applicable
 5. Handling Weight
 6. Wire Size, Spacing and area provided per vertical foot
 7. Reinforcing Bar size and spacing
 8. Design loads
 9. Concrete Mix No. and design strength
 10. Height, width, slope and annular space of the tongue and groove
- C. Pipe Connector Details and Material Specifications
- D. Joint Material Detail, Material Specifications and calculations showing that the

joint material cross section is greater than the joint's annular space times its height.

- E. Lifting Device and Hole Detail.
- F. At the request of the Engineer or Owner, submit the following:
 - 1. Structural analysis and design calculations for Precast Components, performed in accordance with applicable codes and standards, showing that allowable stresses will not be exceeded. All calculations must be sealed by a Registered Professional Engineer employed by the Precast Concrete Manufacturer.
 - 2. Calculations or test results verifying that the lifting device components and holes are designed in accordance with OSHA Standard 1926.704.
 - 3. Concrete 28 day compression strength results for every day production of Precast Components for the project was performed, showing the required strength according to the guidelines established in ACI 318.
 - 4. Reinforcing and Cement mill reports for materials used in the manufacture of Precast Components for this project.
 - 5. The above test reports for similar Precast Components recently produced, submitted prior to production of Precast Components for this project.

1.04 QUALIFICATIONS

- A. The Precast Manufacturer shall comply with one of the following requirements:
 - 1. Manufacture Precast components for the project in a plant certified in the Prestressed Concrete Institute's (PCI) Plant Certification Program.
 - 2. Manufacture Precast Components for the project in a plant certified in the National Precast Concrete Association's (NPCA) Plant Certification Program.
 - 3. Retain an independent testing or consulting engineering firm approved by the Engineer for Precast plant inspection. The basis for plant inspection shall be the National Precast Concrete Association Quality Control Manual or the Manual for Quality Control for Plants and Production of Precast

and Prestressed Concrete Products. The above firm shall inspect the precast plant 2 weeks prior to and at 1 week intervals during production of materials for this project and issue a report, certified by a Registered Engineer that materials, methods, products, and quality control meet the requirements of the above quality control manuals.

- B. The Precast Manufacturer shall have a recognized Quality Improvement Process installed at the manufacturing facility.
- C. The Precast Manufacturer shall employ at least one Registered Professional Engineer at the manufacturing facility through the life of the project.
- D. All concrete compressive strength testing shall be performed in a laboratory inspected by the CCRL of the National Bureau of Standards.

1.05 ENVIRONMENTAL REQUIREMENTS

- A. Maintain materials and surrounding air temperature to minimum 50 degrees F prior to, during, and 48 hours after completion of masonry, grouting or concreting work.

1.06 DEFINITIONS

- A. Wet well shall be watertight, precast reinforced air-entrained concrete structures.
- B. Lift Station wet well shall be designed to ASTM C890 A8 live loading.
- C. Honeycombed or retempered concrete is not permitted.
- D. Precast manufacturer shall coordinate with manufacturer of access hatches to provide the required hatch opening dimensions and ensure proper reinforcing is obtained between and around hatch openings to provide the specified design loading requirements.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Concrete: Concrete shall conform to ASTM C913 and as follows:
 - 1. Compressive strength: 5000 psi minimum at 28 days
 - 2. Air Content: 4 percent minimum.

3. Alkalinity: Adequate to provide a Life Factor, $A_z = \text{Calcium Carbonate Equivalent times Cover over Reinforcement}$, no less than 0.35 for bases, risers and tops.
 4. Cementitious Materials: Minimum of 564 pounds per c.y..
 5. Coarse Aggregates: ASTM C33. Sound, Crushed, Angular Granitic Stone only. Smooth or rounded stone shall not be used.
 6. Fine Aggregates: ASTM C33. Free from organic impurities.
 7. Chemical Admixtures: ASTM C494. Calcium Chloride or admixtures containing calcium chloride shall not be used.
 8. Air Entraining admixtures: ASTM C260.
- B. Reinforcing: Reinforcing steel shall be ASTM A615 grade 60 deformed bar, ASTM A82 wire or ASTM A185 welded wire fabric.
 - C. Lifting Loops: Lift loops shall be ASTM A416 steel strand. Lifting loops made from deformed bars shall not be allowed.
 - D. Butyl Rubber Sealant shall conform to Federal Specification SS-S-210A, AASHTO M-198, Type B - Butyl Rubber and as follows: maximum of 1% volatile matter and suitable for application temperatures between 10 and 100 degrees F.
 - E. Butyl Rubber with Bentonite Sealant shall conform to Federal Specification SS-S-210A, ASTM D-297, and containing no asphaltics as follows: maintaining 99% solids with a maximum of 1% volatile matter and suitable for application temperatures between 5 and 125 degrees F.
 - F. Epoxy Gels: Epoxy Gels used for interior patching of wall penetrations shall be a 2-component, solvent-free, moisture-insensitive, high modulus, high-strength, structural epoxy paste adhesive meeting ASTM C-881, Type I and II, Grade 3, Class B and C, Epoxy Resin Adhesive.

2.02 COMPONENTS

- A. Precast Component Fabrication and Manufacture shall be as described in this paragraph and as described in the paragraphs for the specific components.
 1. Precast Manufacturing: Precast Structures shall be manufactured in conformance with ASTM C913. Wall and inside slab finishes resulting from casting against forms standard for the industry shall be acceptable, except form ties through the wall of the product are not allowed. Exterior slab surfaces shall

have a float finish. Small surface holes, normal color variations, normal form joint marks, and minor depressions, chips and spalls will be tolerated. Edges may be tooled. Dimensional tolerances shall be those set forth in the appropriate References and specified below.

2. Joints: Joints surfaces for joints between Precast Structure Components shall be keyways or tongue and grooves manufactured to the joint surface design and tolerance requirements of ASTM C913.
 3. Lift Inserts and Holes: If used for handling Precast Structures, lift holes and inserts shall be sized for a precision fit with the lift devices, shall not penetrate through the precast structure wall and shall comply with OSHA Standard 1926.704.
- B. Precast Base Sections: Base sections shall have the base slab cast monolithically with the walls, or have an approved galvanized or PVC waterstop cast in the cold joint between the base slab and the walls.
- C. Precast Riser Sections: The Minimum Lay Length of Precast Riser Sections shall be 36".
- D. Precast Top Sections: Flat Slab Top Sections shall meet or exceed the design loading requirements of the respective structures as specified in paragraph 1.03, B.8 above. Transition Top Sections shall provide for transition to other diameter risers, cones, and flat slab top sections with a joint equal to that of a riser section. Venting of top sections shall be as shown on the details.
- E. Pipe to Manhole Connectors: Pipe to Manhole Connectors shall conform to ASTM C923. On large diameter flexible pipes, provisions for control of the pipe OD to within the tolerances of the connector shall be made.
- F. Joint Sealing Materials: Joints shall be sealed internally between the tongue and the groove and additionally around the external perimeter of the joint. Sealants are as follows:
1. External Seals shall consist of a cross linked, high density polyethylene membrane, Riser-Wrap™ or equal, no less than 1/16" thick and 6" wide applied per the manufacturer's instructions to the outside perimeter of the joint.
 2. Joints with a perimeter greater than or equal to 18'

shall be internally sealed with Butyl Rubber/Bentonite Sealant.

3. Joints with a perimeter less than 18' shall be internally sealed with Butyl Rubber Sealant.

- G. Hatches: Hatches and doors, frames and grate to be provided as equal to those shown on the precast structure details. Material shall be stainless steel or aluminum as conforming to details per application. For dimensions of castings see precast top details. Hatches shall have a load capacity of 300 psf minimum. Hatches shall be of the size and type shown on the plans by Halliday Products, Inc., WACO Products, Inc., or USF Fabrication, Inc.
- H. Lifting Devices: Lifting devices complying with OSHA Standard 1926.704 for handling the Precast Components shall be provided by the Precast Manufacturer. The design of lifting devices shall comply with ASTM C913, paragraph 5.8 standards.
- I. Liners: Where shown on the plans, the interior of the precast structure shall be lined with an epoxy system (TNEMEC Company epoxy system or approved equal). The liner shall be installed in accordance with the recommendations of the liner manufacturer.

1. Epoxy system: TNEMEC Company epoxy system; Equal products may be submitted that don't change the generic description, solids by volume and the number of coats. ASTM performance criteria must accompany the submittal and all test reports submitted must meet and exceed the basis of design.

Surface Preparation – Allow new concrete to dry for 28 days. Verify dryness by testing for moisture. Moisture content should not exceed 3 lbs. per 1,000 sq. ft. Abrasive sweep blast to a CSP 5 minimum. Prior to painting the substrate must be clean dry and free of all contaminants.

1st Coat – Tnemec Series 218 applied at a full skim coat at 1/16" on average

2nd Coat – Tnemec Series 436 applied at 80 mils

The product shall have a material warranty period of 5 years against penetration of hydrogen sulfide gas and sulfuric acids.

- J. Ladders: If shown on Precast Structure Details, fixed ladders shall be provided in rectangular structures greater than 8' deep in accordance with all OSHA requirements. Ladders are not required for rectangular structures 8' deep and less.

2.03 CONFIGURATION

- A. Precast Concrete Structures are to be constructed as specified.
- B. The number of joints is to be minimized. Use no more than 2 sections up to 8' depth and no more than 1 additional section for each 4' of depth.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Inspect precast components prior to unloading from the delivery truck.

3.02 PREPARATION

- A. Product Delivery, Storage, and Handling: Coordinate delivery with the manufacturer, handle and store the Precast Components in accordance with ASTM D891 and the manufacturer's recommendations using methods that will prevent damage to the components and their joint surfaces.

3.03 PLACING PRECAST CONCRETE SECTIONS

- A. Excavate to the required depth and remove materials that are unstable or unsuitable for a good foundation. Prepare a level, compacted foundation extending 6" beyond the precast base and follow ASTM C891 excavation standards.
- B. Set base plumb and level, aligning pipe opening with pipe invert.
- C. Thoroughly clean bells and spigots to remove dirt and other foreign materials that may prevent sealing. Unroll the Butyl Sealant rope directly against base of spigot. Leave prospective wrapper attached until sealant is entirely unrolled against spigot. Do not stretch. Overlap from side to side - not top to bottom.
- D. Set risers and tops, aligning internal wall surfaces, so that proper alignment is achieved, taking particular care to clean, prepare and seal joints.
- E. When recommended by the manufacturer, fill the void between horizontal joint surfaces with a sand cement grout around the outside perimeter.

- F. After joining precast sections, apply the butyl sealant sheet around the outside perimeter of the joint.
- G. Lift Holes leaving less than 2" of wall thickness shall be plugged from the outside using a sand cement mortar. Lift Holes penetrating the wall shall be additionally sealed with an interior application of an epoxy gel 1/8" thick extending 2" beyond the penetration.
- H. Perform the final finishing to the precast interior by filling all chips or fractures greater than 1/2" in length, width or depth and depressions more than 1/2" deep in inverts with a sand cement mortar. Grout joints according to Manufacturers Specifications. Clean the interior of the precast structure, removing all dirt, spills or other foreign matter.

END OF SECTION

**SECTION 03601
GROUT (NON-SHRINK)**

PART 1 – GENERAL

1.01 SCOPE

- A. Under this heading shall be included the furnishing and installation of all non-shrink grouts, complete.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Non-Shrink/Non-Metallic Grout (Type “A”).
 - 1. Grout shall be factory mixed containing natural aggregates formulated to be used at any consistency from extremely fluid to damp pack. The grout shall be similar in finished appearance to concrete and mortar. The grout shall be free of gas producing agents, oxidizing catalysts and inorganic accelerators.
 - 2. Strength of the grout in-place shall meet or exceed the following:

4,000 psi	at	24 Hours
6,000 psi	at	72 Hours
7,500 psi	at	7 Days
9,500 psi	at	28 Days
 - 3. Grout shall be mater-Builders Masterflow 713 Grout, or equal.
- B. Non-Shrink/Metallic Aggregate Grout Type “B”.
 - 1. Grout shall be factory mixed, containing specially graded and processed ferrous metallic cementitious system formulated to be used at any consistency from extremely fluid to damp pack. The grout shall be free of gas producing agents, oxidizing agent and organic accelerators.
 - 2. Strength of the grout in-place shall meet or exceed the following:

4,000 psi	at	24 Hours
6,000 psi	at	72 Hours
8,000 psi	at	7 Days

10,000 psi at 28 Days

3. Grout shall be Master-Builders Embecco 636 Grout, or equal.

C. Water: Water shall be potable.

2.02 GROUTING SCHEDULE

A. Grouting under this Contract shall be done in accordance with the applicable items in the following schedule, unless noted otherwise:

<u>Grouting Applications</u>	<u>Grout Type</u>
Anchor Bolts and Dowels in Cast or Drilled Holes	"A" or "B"
Bearing Plates or angles	"A" or "B"
Aluminum Handrails	"A"
Joining Precast Concrete Elements	"A"

B. Damp pack (plastic) grout shall be used for vertical surfaces with holes having at least one surface dimension less than the hole depth and for holes left by removal of fasteners and form ties.

C. Flowable or fluid grout shall be used for all other applications.

PART 3 – EXECUTION

3.01 SURFACE PREPARATION

A. General:

1. Concrete surfaces to receive grout shall be rough and reasonably level. Laitance shall be removed to sound concrete. The surfaces, including bolt holes shall be saturated with water for 24 hours prior to grouting.

2. Where grout is to be used to repair damaged concrete surfaces, the damaged or honeycombed concrete shall be removed to sound concrete by chipping.

3. Metal surfaces to receive grout shall be cleaned of oil, grease and other deleterious substances by means of appropriate solvents, wire brushing or a combination of both.
- B. Formwork:
1. Forms shall be provided for grout placed at a flowable or fluid consistency.
 2. Forms shall be strong, tight and shall be braced so they will not leak or buckle under the weight of fluid grout.
 3. Forms shall be caulked with grout or a sand-cement mortar to prevent leakage. Expanded polystyrene or other means shall be used to caulk between foundation and portions of the element being grouted to seal off areas where grout is not required.

3.02 GROUT PREPARATION

- A. Grout shall be mixed in a paddle type mortar mixer or other suitable mechanical mixer. Hand mixing will not be permitted. Grout shall be mixed to a consistency according to the method of placement (damp pack or fluid) without overuse of water to the extent to cause bleeding. The grout manufacturer's instructions shall be strictly adhered to and the grout shall be mixed a minimum of 3 minutes and placed immediately. Mixing water temperature shall not be less than 40 Degrees F not exceed 80 Degrees F.

3.03 GROUT PLACEMENT

- A. Grout shall be placed at a temperature of 65 Degrees-75 Degrees F. The contractor shall maintain this temperature range for 24 hours following installation, thereafter above 40 Degrees F. until the strength exceeds 4,000 psi.
- B. Grout shall be placed quickly and continuously and shall not be vibrated or overworked.

3.04 CURING

- A. Ponding or soaking wet cloth shall be applied within 10 minutes after grouting and shall be continued for 3 hours.

END OF SECTION

**SECTION 09900
PAINTING/COATING**

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. The work of this section consists of furnishing all materials, labor, equipment and incidentals required and performing all the painting necessary to complete this Contract in its entirety.

- B. It is the intent of these Specifications to paint all exposed miscellaneous metal, pipe, fittings, supports, valves, equipment and all other work obviously required to be painted including but not limited to, building interior walls, ceilings, floors, trim, as indicated on the drawings and specified herein, except as otherwise specified. Minor items omitted in the schedule of work shall be included in the work of this Section where they come within the general intent of the specifications as stated herein.

- C. The following surfaces or items are not required to be painted:
 - 1. Portions of metal, other than aluminum, embedded in concrete. This does not apply to the back face of items mounted to concrete or masonry surfaces which shall be painted before erection. Aluminum to be embedded in or in contact with concrete or masonry shall be coated to prevent electrolysis.

 - 2. Stainless steel.

 - 3. Fencing.

 - 4. Tile.

 - 5. Finish hardware, except door closers that are not stainless steel.

 - 6. Manhole frames and covers.

 - 7. Fiberglass other than piping.

 - 8. Packing glands and other adjustable parts and nameplates of mechanical equipment.

 - 9. Galvanized conduit.

10. Copper pipe.
11. Galvanized pipe.
12. Aluminum Handrail

1.02 RELATED SECTIONS

- A. Section 09865 – Surface Preparation and Shop Prime Painting

1.03 REFERENCES

- A. ANSI/NSF 61 - Drinking Water System Components - Health Effects.
- B. ASTM D 16 - Terminology Relating to Paint, Varnish, Lacquer, and Related Products.
- C. ASTM D 4263 - Indicating Moisture in Concrete by the Plastic Sheet Method.
- D. ASTM F 1869 - Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
- E. AWWA C 652 - Disinfection of Water-Storage Facilities.
- F. AWWA D 102 - Painting Steel Water Storage Tanks.
- G. International Concrete Repair Institute (ICRI) Guideline No. 03732 - Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays.
- H. SSPC-SP 1 - Solvent Cleaning.
- I. SSPC-SP 2 - Hand Tool Cleaning.
- J. SSPC-SP 3 - Power Tool Cleaning.
- K. SSPC-SP 5/NACE 1 - White Metal Blast Cleaning.
- L. SSPC-SP 6/NACE 3 - Commercial Blast Cleaning.
- M. SSPC-SP 10/NACE 2 - Near-White Metal Blast Cleaning.
- N. SSPC-SP 13/NACE 6 - Surface Preparation of Concrete.

1.04 DEFINITIONS

- A. Definitions of Painting Terms: ASTM D 16, unless otherwise specified.
- B. Dry Film Thickness (DFT): Thickness of a coat of paint in fully cured state measured in mils (1/1000 inch).

1.05 SUBMITTALS

- A. Comply with Section 01300 - Submittals
- B. Product Data: Submit manufacturer's product data for each coating, including generic description, complete technical data, surface preparation, and application instructions.
- C. Color Samples: Submit manufacturer's color samples showing full range of standard colors.
- D. Manufacturer's Quality Assurance: Submit manufacturer's certification that coatings comply with specified requirements and are suitable for intended application.
- E. Applicator's Quality Assurance: Submit list of a minimum of 5 completed projects of similar size and complexity to this Work. Include for each project:
 - 1. Project name and location.
 - 2. Name of owner.
 - 3. Name of contractor.
 - 4. Name of engineer.
 - 5. Name of coating manufacturer.
 - 6. Approximate area of coatings applied.
 - 7. Date of completion.
- F. Warranty: Submit manufacturer's standard warranty.
- G. Schedule of Painting Operations: Submit to the Engineer for review a complete Schedule of Painting Operations within 90 days after the Notice to Proceed. This

Schedule is imperative so that the various fabricators may be notified of the proper Shop prime coat to apply. Properly notify and coordinate the fabricators' surface Preparation and painting operations with these Specifications. This Schedule shall include for each surface to be painted, the brand name, the percent volume of solids, the coverage and the number of coats the Contractor proposes to use in order to achieve the specified dry film thickness, and color charts. When the Schedule has been approved, apply all material in strict accordance with the approved Schedule and the manufacturer's instructions. Wet and dry paint film gauges shall be made available to the Engineer to verify the proper application while work is in progress.

1.06 QUALITY ASSURANCE

A. Manufacturer's Qualifications:

1. Specialize in manufacture of coatings with a minimum of 10 years successful experience.
2. Able to demonstrate successful performance on comparable projects.
3. Single Source Responsibility: Coatings and coating application accessories shall be products of a single manufacturer.

B. Applicator's Qualifications:

1. Experienced in application of specified coatings for a minimum of 5 years on projects of similar size and complexity to this Work.
2. Applicator's Personnel: Employ persons trained for application of specified coatings.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver painting materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying coating name and manufacturer, color name and number, batch number and date of manufacture. Painting materials shall be used without adulteration and mixed, thinned and applied in strict accordance with manufacturer's directions for the applicable materials and surface and with the Engineer's approval before using.

B. Storage:

1. Store materials in a clean dry area and within temperature range in accordance with manufacturer's instructions.

2. Keep containers sealed until ready for use.
3. Do not use materials beyond manufacturer's shelf life limits.

C. Handling:

1. Protect materials during handling and application to prevent damage or contamination.
2. Work areas will be designated by the Engineer for storage and mixing of all painting materials. Materials shall be in full compliance with the requirements of pertinent codes and fire regulations. Proper containers outside of the buildings shall be provided and used for painting wastes, and no plumbing fixture shall be used for this purpose.
3. All recommendations of the paint manufacturer in regard to the health and safety of workmen shall be followed.

1.08 ENVIRONMENTAL REQUIREMENTS

A. Weather:

1. Air and Surface Temperatures: Prepare surfaces and apply and cure coatings within air and surface temperature range in accordance with manufacturer's instructions.
2. Surface Temperature: Minimum of 5 degrees F (3 degrees C) above dew point.
3. Relative Humidity: Prepare surfaces and apply and cure coatings within relative humidity range in accordance with manufacturer's instructions.
4. Precipitation: Do not prepare surfaces or apply coatings in rain, snow, fog, or mist.
5. Wind: Do not spray coatings if wind velocity is above manufacturer's limit.

B. Ventilation: Provide ventilation during coating evaporation stage in confined or enclosed areas in accordance with AWWA D 102.

C. Dust and Contaminants:

1. Schedule coating work to avoid excessive dust and airborne contaminants.
 2. Protect work areas from excessive dust and airborne contaminants during coating application and curing.
- D. No paint containing lead will be allowed. Oil shall be pure boiled linseed oil.
- E. Coatings in contact with potable water shall be NSF certified.

PART 2 – PRODUCTS

2.01 MANUFACTURER

- A. Tnemec Company Incorporated, 6800 Corporate Drive, Kansas City, Missouri 64120-1372. Toll Free (800) 863-6321. Phone (816) 483-3400. Fax (816) 483-3969. Web Site www.tnemec.com.
- B. Chemprobe Coating Systems, 2805 Industrial Lane, Garland, Texas 75041. Toll Free (800) 760-6776. Fax (972) 271-5553. Web Site www.chemprobe.com.
- C. Materials specified are those that have been evaluated for the specific service. Products of Tnemec Company, Inc., Carblin, Thorocoat, and Chemprobe Coating Systems are listed to establish a standard of quality. Equivalent materials of other manufacturers may be substituted on written approval of the Engineer. Requests for substitution shall include manufacturers literature for each product giving the name, product number, generic type, descriptive information, solids-by-volume, recommended dry film thickness, and certified test reports showing results to equal the performance of the specified products listed herein. In addition, a list of five projects shall be submitted in which each product has been used and rendered a minimum of five years of satisfactory service. All requests for substitution shall be made in writing in accordance with Section 01300.

2.02 COATING SYSTEMS FOR STEEL – STRUCTURAL, TANKS, PIPE, AND EQUIPMENT

- A. Exterior Exposed:
1. System Type: Epoxy/epoxy/urethane.
 2. Surface Preparation: SSPC-SP 6.
 3. Primer: Series N68-1255 Beige Poxiprime II. DFT 3.0 to 5.0 mils.

4. Intermediate Coat: Series 66 Hi-Build Epoxoline. DFT 2.0 to 3.0 mils.
5. Finish Coat: Series 1075 Endura-Shield II. DFT 2.0 to 5.0 mils.
6. Total DFT: 7.0 to 13.0 mils.
7. Finish Color: As selected by Engineer from manufacturer's standard colors, and/or coating schedule Paragraph 3.20 of this Section.

B. Interior Exposed:

1. System Type: Epoxy.
2. Surface Preparation: SSPC-SP 6.
3. Primer: Series N68-1255 Beige Poxiprime II. DFT 3.0 to 5.0 mils.
4. Finish Coat: Series 66 Hi-Build Epoxoline. DFT 4.0 to 6.0 mils.
5. Total DFT: 7.0 to 11.0 mils.
6. Finish Color: As selected by Engineer from manufacturer's standard colors, and/or coating schedule Paragraph 3.20 of this Section.

C. Immersion:

1. System Type: Epoxy.
2. Surface Preparation: SSPC-SP 10.
3. Primer: Series N140-1255 Pota-Pox Plus. DFT 3.0 to 5.0 mils.
4. Finish Coat: Series N140 Pota-Pox Plus. DFT 4.0 to 6.0 mils.
5. Total DFT: 7.0 to 12.0 mils.
6. Finish Color: WH02 Tank White.

D. Below Grade:

1. System Type: Coal tar epoxy.
2. Surface Preparation: SSPC-SP 10.

3. Primer: Series 66 Hi-Build Epoxoline. DFT 3.0 to 5.0 mils.
4. Finish Coat: Series 46H-413 Hi-Build Tneme-Tar. DFT 14.0 to 20.0 mils.
5. Total DFT: 17.0 to 25.0 mils.
6. Finish Color: Black.

2.03 COATING SYSTEMS FOR FACTORY PRIMED STEEL – DOORS, FRAMES, AND MISCELLANEOUS EQUIPMENT

A. Exterior Exposed:

1. System Type: Epoxy/urethane.
2. Surface Preparation: Clean and dry.
3. Primer: Factory primed – Tnemec Series 1 DFT 2.0 to 3.0 mils
4. Intermediate Coat: Series 27 Typoxy. DFT 2.0 to 3.0 mils.
5. Finish Coat: Series 1075 Endura-Shield II. DFT 2.0 to 3.0 mils.
6. Total DFT: 4.0 to 6.0 mils.
7. Finish Color: As selected by Engineer from manufacturer's standard colors.

B. Interior Exposed:

1. System Type: Epoxy.
2. Surface Preparation: Clean and dry.
3. Primer: Factory primed – Tnemec Series 1 DFT 2.0 to 3.0 mils
4. Intermediate Coat: Series 27 Typoxy. DFT 2.0 to 3.0 mils.
5. Finish Coat: Series 66 Hi-Build Epoxoline. DFT 2.0 to 3.0 mils.
6. Total DFT: 4.0 to 6.0 mils.
7. Finish Color: As selected by Engineer from manufacturer's standard colors.

2.04 COATING SYSTEMS FOR GALVANIZED STEEL AND NONFERROUS METAL - PIPE AND MISCELLANEOUS FABRICATIONS

A. Exterior Exposed:

1. System Type: Epoxy/urethane.
2. Surface Preparation: In accordance with manufacturer's instructions.
3. Primer: Series 66 Hi-Build Epoxoline. DFT 2.0 to 3.0 mils.
4. Finish Coat: Series 1075 Endura-Shield II. DFT 2.0 to 3.0 mils.
5. Total DFT: 4.0 to 6.0 mils.
6. Finish Color: As selected by Engineer from manufacturer's standard colors.

B. Interior Exposed:

1. System Type: Epoxy.
2. Surface Preparation: In accordance with manufacturer's instructions.
3. Primer: Series 66 Hi-Build Epoxoline. DFT 2.0 to 3.0 mils.
4. Finish Coat: Series 66 Hi-Build Epoxoline. DFT 2.0 to 3.0 mils.
5. Total DFT: 4.0 to 6.0 mils.
6. Finish Color: As selected by Engineer from manufacturer's standard colors, and/or coating schedule Paragraph 3.20 of this Section.

C. Immersion:

1. System Type: Epoxy.
2. Surface Preparation: SSPC-SP 1 followed by abrasive blast.
3. Primer: Series N140-1255 Pota-Pox Plus. DFT 3.0 to 5.0 mils.
4. Finish Coat: Series N140 Pota-Pox Plus. DFT 3.0 to 5.0 mils.

5. Total DFT: 6.0 to 10.0 mils.
6. Finish Color: WH02 Tank White.

2.05 COATING SYSTEMS FOR DUCTILE OR CAST IRON – PIPE, FITTINGS, AND VALVES

A. Exterior Exposed (Includes - Inside Lift Station Wet Well and Valve Vault Structures and Inside Gravity Sewer Manholes):

1. System Type: Epoxy.
2. Surface Preparation: In accordance with manufacturer's instructions.
3. Primer: Series N140-1255. DFT 3.0 to 5.0 mils.
4. Finish Coat: Tnemec Series 431 Polyamine Ceramic Epoxy. DFT 3.0 to 5.0 mils.
5. Total DFT: 6.0 to 10.0 mils.
6. Finish Color: As selected by Engineer from manufacturer's standard colors, and/or coating schedule Paragraph 3.20 of this Section.

B. Below Ground - Buried:

1. System Type: Epoxy.
2. Surface Preparation: In accordance with manufacturer's instructions.
3. Primer: Series N140 Pota-Pox Plus. DFT 3.0 to 5.0 mils.
4. Total DFT: 5.0 mils.
5. Finish Color: Beige.

C. Interior Exposed:

1. System Type: Epoxy.
2. Surface Preparation: In accordance with manufacturer's instructions.
3. Primer: Series 66 Hi-Build Epoxoline. DFT 3.0 to 5.0 mils.
4. Finish Coat: Series 66 Hi-Build Epoxoline. DFT 4.0 to 6.0 mils.

5. Total DFT: 7.0 to 11.0 mils.
 6. Finish Color: As selected by Engineer from manufacturer's standard colors, and/or coating schedule Paragraph 3.20 of this Section.
- D. Immersion (Includes Buried Installations Greater Than 10' Depths):
1. System Type: Epoxy.
 2. Surface Preparation: In accordance with manufacturer's instructions.
 3. Primer: Series N140 Pota-Pox Plus. DFT 3.0 to 5.0 mils.
 4. Finish Coat: Series N140 Pota-Pox Plus. DFT 4.0 to 6.0 mils.
 5. Total DFT: 7.0 to 11.0 mils.
 6. Finish Color: 1255 Beige.

2.06 COATING SYSTEMS FOR PVC

- A. Exterior Exposed:
1. System Type: Epoxy/urethane.
 2. Surface Preparation: Scarify.
 3. Primer: Series 66 Hi-Build Epoxoline. DFT 2.0 to 3.0 mils.
 4. Finish Coat: Series 1075 Endura-Shield. DFT 2.0 to 3.0 mils.
 5. Total DFT: 4.0 to 6.0 mils.
 6. Finish Color: As selected by Engineer from manufacturer's standard colors, and/or coating schedule Paragraph 3.20 of this Section.
- B. Interior Exposed:
1. System Type: Epoxy.
 2. Surface Preparation: Scarify.

3. Primer: Series 66 Hi-Build Epoxoline. DFT 2.0 to 3.0 mils.
4. Finish Coat: Series 66 Hi-Build Epoxoline. DFT 2.0 to 3.0 mils.
5. Total DFT: 4.0 to 6.0 mils.
6. Finish Color: As selected by Engineer from manufacturer's standard colors, and/or coating schedule Paragraph 3.20 of this Section.

2.07 COATING SYSTEMS FOR INSULATED PIPE

- A. Interior/Exterior Exposed:
1. System Type: Acrylic.
 2. Surface Preparation: Clean and dry.
 3. Primer: Series 6 Tneme-Cryl. DFT 2.0 to 3.0 mils.
 4. Finish Coat: Series 6 Tneme-Cryl. DFT 2.0 to 3.0 mils.
 5. Total DFT: 4.0 to 6.0 mils.
 6. Finish Color: As selected by Engineer from manufacturer's standard colors, and/or coating schedule Paragraph 3.20 of this Section.

2.08 COATING SYSTEMS FOR CONCRETE FLOORS

- A. Epoxy/Chemical-Resistant Urethane:
1. System Type: Epoxy/Chemical-Resistant Urethane.
 2. Surface Preparation: ICRI CSP 2 to 3.
 3. Primer: Series 66 Hi-Build Epoxoline. DFT 3.0 to 5.0 mils.
 4. Finish Coats: (2) Coats - Series 291 CRU. DFT 2.0 to 3.0 mils. Include 80 – 120 mesh glass bead at a rate of 1.5 ounces (by volume) per mixed gallon.
 5. Total DFT: 5.0 to 8.0 mils.
 6. Finish Color: As selected by Engineer from manufacturer's standard colors.

2.09 COATING SYSTEMS FOR POROUS CONCRETE MASONRY UNITS

- A. Exterior Exposed Architectural Block:
 - 1. System Type: Alkylalkoxy siloxane sealer
 - 2. Surface Preparation: SSPC-SP 13/NACE 6. Clean and dry.
 - 3. First Coat: Series 633 Prime A Pell H₂O. Spreading rate 50 to 75 square feet per gallon.
 - 4. Second Coat: Series 633 Prime A Pell H₂O. Spreading rate 50 to 75 square feet per gallon. Apply in accordance with Manufacturer's instructions.
 - 5. Finish Color: Clear.

- B. Interior Exposed:
 - 1. System Type: Epoxy.
 - 2. Surface Preparation:
 - a. Porous Concrete Masonry Units: SSPC-SP 13/NACE 6. Clean and dry.
 - b. Concrete: SSPC-SP 13/NACE 6. Abrasive blast.
 - 3. Surfacer: Series 54-660 Masonry Filler. Spreading rate 75 to 100 square feet per gallon.
 - 4. Finish Coat: Series 66 Hi-Build Epoxoline. DFT 4.0 to 6.0 mils.
 - 5. Total DFT: 8.0 to 12.0 mils, plus surfacer.
 - 6. Finish Color: As selected by Engineer from manufacturer's standard colors.

2.10 COATING SYSTEMS FOR WOOD

- A. Interior Exposed:
 - 1. System Type: Alkyd/acrylic-epoxy.

2. Surface Preparation: Clean and dry.
 3. Primer: Series 36 Undercoater, DFT 2.0 to 3.5 mils.
 4. Finish Coat: Series 113 H.B. Tneme-Tufcoat. DFT 4.0 to 6.0 mils.
 5. Total DFT: 6.0 to 9.5 mils.
 6. Finish Color: As selected by Engineer from manufacturer's standard colors.
- B. Interior Exposed:
1. System Type: Alkyd/acrylic.
 2. Surface Preparation: Clean and dry.
 3. Primer: Series 36 Undercoater, DFT 2.0 to 3.5 mils.
 4. Intermediate Coat: Series 28 Tufcryl. DFT 1.5 to 2.0 mils.
 5. Finish Coat: Series 28 Tufcryl. DFT 1.5 to 2.0 mils.
 6. Total DFT: 5.0 to 7.5 mils.
 7. Finish Color: As selected by Engineer from manufacturer's standard colors.

2.11 COATING SYSTEMS FOR CONCRETE STRUCTURES (INCLUDING PRECAST)

- A. Exterior of all concrete structures not covered specifically in specification
1. Tamms Concrete Finisher applied in 2 coats, 1/8" thick.
 - a. All exterior concrete to be finished in a color selected by the Owner prior to construction start.
 - b. Surface preparation shall be in accordance with Section 03300 and manufacturer's recommendations. Lifting lugs shall be removed and grouted over prior to treatment.

2.12 ACCESSORIES

- A. Coating Application Accessories:

1. Accessories required for application of specified coatings in accordance with manufacturer's instructions, including thinners.
2. Products of coating manufacturer.

2.13 MISCELLANEOUS

- A. Any surfaces not specifically named in the Schedule and not specifically excepted shall be prepared, primed and painted in the manner and with materials consistent with these Specifications. The Engineer shall select which of the manufacturer's products, whether the type is indicated herein or not, shall be used for such unnamed surfaces. No extra payment shall be made for this painting.

2.14 COLOR CODING FOR PIPES AND EQUIPMENT

- A. When color coding is specified, it shall consist of color code painting and identification of all exposed conduits, trough items and pipelines for the transport of gases, liquid and semi-liquids including all accessories such as valves, insulated pipe coverings, fittings, junction boxes, bus bars, connectors and all operating accessories which are integral to be whole functional mechanical pipe and electrical conduit system. Colors shall be as noted in the Paint and Color Coding Schedules attached at the end of this Section.
- B. All hangers and pipe support floor stands shall be painted the same color and with the same paint as the pipe it supports. The system shall be painted up to but not including the flanges attached to the mechanical equipment nor the flexible conduit connected to electrical motors. When more than one pipe system is supported on the same bracket, the bracket shall be painted the same color as the adjacent wall or ceiling. Colors shall be as noted in the Paint and Color Coding Schedule.
- C. All systems which are an integral part of the equipment, that is originating from the equipment and returning to the same piece of equipment, shall be painted between and up to but not including, the fixed flanges or connections on the equipment.
- D. The color code establishes, defines and assigns a definite color for each category of pipe. Pipelines which are not listed on the Schedule of Color Code Paints shall be assigned a color by the Engineer and shall be treated as an integral part of the Contract.
- E. Banding for pipes shall be as specified in the Paint and Color Coding Schedule. Bands shall be 2 inches wide and spaced at 2 feet on center.

2.15 LETTERING OF TITLES

- A. Each pipe system shall be labeled with the name of the materials in each pipeline and alongside this an arrow indicating the direction of flow of liquids. Titles shall be as so described in attached schedule. Titles shall not be located more than 20 linear feet apart and shall also appear directly adjacent to each side of any wall the pipeline breaches, adjacent to each side of the valve regulator, flowcheck, strainer cleanout, and all pieces of equipment.
- B. Titles shall identify the contents by complete name. Identification title locations shall be determined by the Engineer but in general they shall be placed where the view is unobstructed and on the two lower quarters of pipe or covering where they are overhead. Title should be clearly visible from operating positions especially those adjacent to control valves.
- C. Titles on equipment shall be applied at eye level on machines where possible or at the upper most broad vertical surface of low equipment. Where more than one piece of the equipment item to be titled exists, the items shall be numbered consecutively as indicated on the mechanical drawings or as directed by the Engineer; for example Pump No. 1, Pump No. 2, etc. Titles shall be composed and justified on the left hand side as follows: Pump No. 1
- D. Application of titles.
1. The color of the titles shall be black or white as approved, to best contrast with the color of the pipes and equipment and shall be stencil applied.
 2. Stencil text is to be in ALL CAPS worded exactly as shown in the Schedule. Titles are to be printed in a single line.
 3. Letter sizes.

<u>Outside Diameter of Pipe or Covering (inches)</u>	<u>Size of Legend Letters (inches)</u>
3/4 to 1-1/4	1/2
1-1/2 to 2	3/4
2-1/2 to 6	1-1/4
8 to 10	2-1/2
More than 10	3-1/2

Equipment titles are to be two inches high.

4. Arrow sizes. Where "a" is equal to 3/4 of outside diameter of pipe or covering, the arrow shaft shall be 2 "a" long by 3/8 "a" wide. The arrow head shall be an equilateral triangle with sides equal to "a." Maximum "a" dimension shall be 6 inches.
5. When using direction arrows, point arrowhead away from pipe markers and indirection of flow. If flow can be in both directions, use a double-headed directional flow.

2.16 METAL TAGS

- A. For pipelines smaller than 3/4-inch in diameter, securely fasten metal tags, 2-1/2-inches x 1/2-inches, of 17 Birmingham Stubs Gage Brass with lettering etched and filled with enamel. Tags shall be approved by the Engineer.

2.17 FABRICATED EQUIPMENT

- A. Unless otherwise indicated all fabricated equipment shall be shop primed and shop or field finished.
- B. All items to be shop primed shall be thoroughly cleaned of all loose material prior to priming. If, in the opinion of the Engineer, any prime coating shall have been improperly applied or if material contrary to these Specifications shall have been used, that coating shall be removed by sandblasting to white metal and reprimed in accordance with the Specifications.
- C. All shop prime coats shall be of the correct materials and applied in accordance with these Specification. Remove any prime coats not in accordance with these Specifications by sandblasting and apply the specified prime coat at no additional cost to the Owner.
- D. Shop primed surfaces shall be cleaned thoroughly and damaged or bare spots retouched with the specified primer before the application of successive paint coats in the field.
- E. Be responsible for and take whatever steps are necessary to properly protect the shop prime and finish coats against damage from weather or any other cause.
- F. A shop finish coat shall be equal in appearance and protection quality to a field applied finish coat. If, in the opinion of the Engineer, a shop finish coat does not give the appearance and protection quality of other work of similar nature,

prepare the surfaces and apply the coat or coats of paint as directed by the Engineer to accomplish the desired appearance and protection quality. Submit to the Engineer substantial evidence that the standard finish is compatible with the specified finish coat.

- G. Wherever fabricated equipment is required to be sandblasted, protect all motors, drives, bearings, gears, etc., from the entry of grit. Any equipment found to contain grit shall be promptly and thoroughly cleaned.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine areas and conditions under which coating systems are to be applied. Notify Engineer of areas or conditions not acceptable. Do not begin surface preparation or application until unacceptable areas or conditions have been corrected.

3.02 PROTECTION OF SURFACES NOT SCHEDULED TO BE COATED

- A. Protect surrounding areas and surfaces not scheduled to be coated from damage during surface preparation and application of coatings.
- B. Immediately remove coatings that fall on surrounding areas and surfaces not scheduled to be coated.

3.03 SURFACE PREPARATION OF STEEL

- A. Prepare steel surfaces in accordance with manufacturer's instructions.
- B. Fabrication Defects:
 1. Correct steel and fabrication defects revealed by surface preparation.
 2. Remove weld spatter and slag.
 3. Round sharp edges and corners of welds to a smooth contour.
 4. Smooth weld undercuts and recesses.
 5. Grind down porous welds to pinhole-free metal.
 6. Remove weld flux from surface.

- C. Ensure surfaces are dry.
- D. Immersion or Below Grade Surfaces: Remove visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter in accordance with SSPC-SP 10/NACE 2.
- E. Exterior Exposed or Interior Exposed Surfaces: Remove visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter in accordance with SSPC-SP 6/NACE 3.
- F. Interior or Immersion Surfaces, Severe Exposure: Remove visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter in accordance with SSPC-SP 5/NACE 1.
- G. Abrasive Blast-Cleaned Surfaces: Coat abrasive blast-cleaned surfaces with primer before visible rust forms on surface. Do not leave blast-cleaned surfaces uncoated for more than 8 hours.
- H. Shop Primer: Prepare shop primer to receive field coat in accordance with manufacturer's Instructions.

3.04 SURFACE PREPARATION OF GALVANIZED STEEL AND NONFERROUS METAL

- A. Prepare galvanized steel and nonferrous metal surfaces in accordance with manufacturer's instructions.
- B. Ensure surfaces are dry.
- C. Remove visible oil, grease, dirt, dust, protective mill coatings, and other soluble contaminants in accordance with SSPC-SP 1 or manufacturer's instructions as specified for coating system.
- D. Immersion Service: Clean surfaces by abrasive blasting.
- E. Remove Rust From Galvanized Steel:
 - 1. Remove white rust from galvanized steel by hand or power brushing.
 - 2. Remove rust from old galvanized steel in accordance with SSPC-SP 2 or SP 3.
 - 3. Do not damage or remove galvanizing.
- F. Increase mechanical adhesion under moderate to severe conditions, such as

exterior exposure or chemical environments, by abrasive blast and/or chemical cleaning with Oakite CrysCoat 747 LTS at a rate of 100 square feet per gallon (undiluted).

3.05 SURFACE PREPARATION OF DUCTILE OR CAST IRON

- A. Prepare ductile or cast iron surfaces in accordance with manufacturer's instructions.
- B. Ensure surfaces are clean, dry, and free of oil, grease, dirt, dust, and other contaminants.

3.06 SURFACE PREPARATION OF PVC

- A. Prepare PVC surfaces in accordance with manufacturer's instructions.
- B. Ensure surfaces are clean, dry, and free of oil, grease, dirt, dust, and other contaminants.
- C. Scarify PVC surfaces.

3.07 SURFACE PREPARATION OF INSULATED PIPE

- A. Prepare insulated pipe surfaces in accordance with manufacturer's instructions.
- B. Ensure surfaces are clean, dry, and free of oil, grease, dirt, dust, and other contaminants.

3.08 SURFACE PREPARATION OF CONCRETE

- A. Interior, Wet Substrate:
 - 1. Prepare concrete surfaces in accordance with manufacturer's instructions, SSPC-SP 13/NACE 6, and ICRI 03732.
 - 2. Allow concrete to cure for a minimum of 28 days.
 - 3. Test concrete for moisture in accordance with ASTM D 4263 and F 1869.
 - 4. Abrasive blast surface to remove laitance and solid contaminants and to provide clean, sound substrate with uniform anchor profile.
 - 5. Fill holes, pits, voids, and cracks with Tnemec 63-1500 Filler and Surfacer.

6. Ensure surfaces are clean, dry, and free of oil, grease, chalk, form release agents, and other contaminants.
- B. Exterior:
1. Prepare concrete surfaces in accordance with manufacturer's instructions, SSPC-SP 13/NACE 6, and ICRI 03732.
 2. Allow concrete to cure for a minimum of 28 days.
 3. Test concrete for moisture in accordance with ASTM D 4263 and F 1869.
 4. Level concrete protrusions and mortar spatter.
 5. Ensure surfaces are clean, dry, and free of oil, grease, chalk, form release agents, and other contaminants.

3.09 SURFACE PREPARATION OF CONCRETE FLOORS

- A. Prepare concrete surfaces in accordance with manufacturer's instructions, SSPC-SP 13/NACE 6, and ICRI 03732. Minimum surface preparation for 1/8" and thicker floor systems to be ICRI CSP 4 (light scarification). Regardless of preparation method used, finish shall be made acceptable to Engineer.
- B. Ensure surfaces are clean, dry, and free of oil, grease, dirt, dust, and other contaminants.
- C. Allow concrete to cure for a minimum of 28 days before coating.
- D. Test concrete for moisture in accordance with ASTM D 4263 and F 1869.

3.10 SURFACE PREPARATION OF POROUS CONCRETE MASONRY UNITS

- A. Prepare porous concrete masonry unit surfaces in accordance with manufacturer's instructions and SSPC-SP 13/NACE 6.
- B. Ensure surfaces are clean, dry, and free of oil, grease, dirt, dust, and other contaminants.
- C. Allow mortar to cure for a minimum of 28 days before coating.
- D. Level protrusions and mortar spatter.

3.11 SURFACE PREPARATION OF WOOD

- A. Prepare wood surfaces in accordance with manufacturer's instructions.
- B. Ensure surfaces are clean, dry, and free of oil, grease, dirt, dust, surface deposits of sap or pitch, and other contaminants.
- C. Seal knots and pitch pockets.
- D. Sand rough spots with the grain.
- E. Fill cracks and holes with approved materials after primer is dry. Sand flush with surface when filler is hard.
- F. Lightly sand between coats.

3.12 APPLICATION

- A. Apply coatings in accordance with manufacturer's instructions.
- B. Mix and thin coatings, including multi-component materials, in accordance with manufacturer's instructions.
- C. Keep containers closed when not in use to avoid contamination.
- D. Do not use mixed coatings beyond pot life limits.
- E. Use application equipment, tools, pressure settings, and techniques in accordance with manufacturer's instructions.
- F. Uniformly apply coatings at spreading rate required to achieve specified DFT.
- G. Apply coatings to be free of film characteristics or defects that would adversely affect performance or appearance of coating systems.
- H. Stripe paint with brush critical locations on steel such as welds, corners, and edges using specified primer.

3.13 DISINFECTION

- A. Disinfection of Water Contact Surfaces and Filling of Water Storage Tanks:
 - 1. Do not disinfect water contact surfaces or fill water storage tanks until application of coating systems is complete, coatings have fully cured, and

field quality control inspection is complete.

2. Allow number of days in accordance with manufacturer's instructions and as directed by Engineer for full cure of coating systems on water contact surfaces before flushing, disinfecting, or filling with water.
3. Disinfection: AWWA C 652 or as directed by Engineer.

3.14 REPAIR

- A. Materials and Surfaces Not Scheduled To Be Coated: Repair or replace damaged materials and surfaces not scheduled to be coated.
- B. Damaged Coatings: Touch-up or repair damaged coatings. Touch-up of minor damage shall be acceptable where result is not visibly different from adjacent surfaces. Recoat entire surface where touch-up result is visibly different, either in sheen, texture, or color.
- C. Coating Defects: Repair in accordance with manufacturer's instructions coatings that exhibit film characteristics or defects that would adversely affect performance or appearance of coating systems.

3.15 FIELD QUALITY CONTROL

- A. Inspector's Services:
 1. Verify coatings and other materials are as specified.
 2. Verify surface preparation and application are as specified.
 3. Verify DFT of each coat and total DFT of each coating system are as specified using wet film and dry film gauges.
 4. Coating Defects: Check coatings for film characteristics or defects that would adversely affect performance or appearance of coating systems.
 - a. Check for holidays on interior steel immersion surfaces using holiday detector.
 5. Report
 - a. Submit written reports describing inspections made and actions taken to correct nonconforming work.

- b. Report nonconforming work not corrected.
 - c. Submit copies of report to Engineer and Contractor.
- B. Manufacturer's Field Services: Manufacturer's representative shall provide technical assistance and guidance for surface preparation and application of coating systems.

3.16 WORKMANSHIP

- A. General:
 - 1. Primer and paint used for a particular surface shall, in general, be as scheduled for that type of new surface. confirm with the paint manufacturer that the paint proposed for a particular repaint condition will be compatible with existing painted surface. Sample repainted areas on the actual site will be required to insure this compatibility. Finished repainted areas shall be covered by the same guarantee specified for remainder of work.
 - 2. At the request of the Engineer, samples of the finished work prepared in strict accordance with these Specifications shall be furnished and all painting shall be equal in quality to the approved samples. Finished areas shall be adequate for the purpose of determining the quality of workmanship. Experimentation with color tints shall be furnished to the satisfaction of the Engineer where standard chart colors are not satisfactory.
 - 3. Protection of furniture and other movable objects, equipment, fittings and accessories shall be provided throughout the painting operations. Canopies of lighting fixtures shall be loosened and removed from contact with surface, covered and protected and reset upon completion. Remove all electric plates, surface hardware, etc., before painting, protect and replace when completed. Mask all machinery name plates and all machined parts not receiving a paint finish. Dripped or spattered paint shall be promptly removed. Lay drop cloths in all areas where painting is being done to adequately protect flooring and other work from all damage during the operation and until the finished job is accepted.
 - 4. On metal surfaces apply each coat of paint at the rate specified by the manufacturer to achieve the minimum dry mil thickness required. If material has thickened or must be diluted for application by spray gun, the coating shall be built up to the same film thickness achieved with

undiluted material. One gallon of paint as originally furnished by the manufacturer shall not cover a greater area when applied by spray gun than when applied unthinned by brush. Deficiencies in film thickness shall be corrected by the application of an additional coat(s). On masonry, application rates will vary according to surface texture, however, in no case shall the manufacturer's stated coverage rate be exceeded. On porous surfaces, it shall be the painter's responsibility to achieve a protective and decorative finish either by decreasing the coverage rate or by applying additional coats of paint.

5. Paints shall be mixed in proper containers of adequate capacity. All paints shall be thoroughly stirred before use and shall be kept stirred while using. No unauthorized thinners or other materials shall be added to any paint.
6. Only skill painters shall be used on the work and specialists shall be employed where required.

B. Field Priming:

1. Steel members, metal castings, mechanical and electrical equipment and other metals which are shop primed before delivery at the site will not require a prime coat on the job. All piping and other bare metals to be painted shall receive one coat of primer before exposure to the weather, and this prime coat shall be the first coat as specified in the painting schedule.
2. Equipment which is customarily shipped with a baked-on enamel finish or with a standard factory finish shall normally be field painted unless the prefinished equipment is specifically color selected and unless the finish has not been damaged in transit or during installation. Surfaces that have been shop painted and have been damaged, or where the shop coats or coats of paint have deteriorated, shall be properly cleaned and retouched before any successive painting is done on them in the field. All such field painting shall match as nearly as possible the original finish.

C. Field Painting:

1. All painting at the site shall be designated as Field Painting.
2. All paint shall be at room temperature before applying, and no painting shall be done when the temperature is below 50 degrees F, in dust-laden air, when rain or snow is falling, or until all traces of moisture have completely disappeared from the surface to be painted.

3. Successive coats of paint shall be tinted so as to make each coat easily distinguishable from each other with the final undercoat tinted to the approximate shade of the finished coat.
4. Finish surfaces shall not show brush marks or other irregularities. Undercoats shall be thoroughly and uniformly sanded with No. 00 sandpaper or equal to remove defects and provide a smooth even surface. Top and bottom edges of doors shall be painted and all exterior trim shall be back-primed before installation.
5. Painting shall be continuous and shall be accomplished in an orderly manner so as to facilitate inspection. All exterior concrete and masonry paint shall be performed at one continuous manner structure by structure. Materials subject to weathering shall be prime coated as quickly as possible. Surfaces of exposed members that will be inaccessible after erection shall be cleaned and painted before erection.
6. All materials shall be brush painted unless spray painting is specifically approved by the Engineer. The Contractor shall be responsible for all damage caused by overspray or drifting.
7. All surfaces to be painted as well as the atmosphere in which painting is to be done shall be kept warm and dry by heating and ventilation, if necessary, until each coat of paint has hardened. Any defective paint shall be scraped off and repainted in accordance with the Engineer's directions.
8. Before final acceptance of the work, all damaged surfaces of paint shall be cleaned and repainted as directed by the Engineer.

3.17 CLEANING

- A. The premises shall at all times be kept free from accumulation of waste material and rubbish caused by employees or work. At the completion of the painting remove all tools, scaffolding, surplus materials, and all rubbish from and about the buildings and leave work "broom clean" unless more exactly specified.
- B. Upon completion, remove all paint where it has been spilled, splashed or splattered on all surfaces, including floors, fixtures, equipment, furniture, etc., leaving the work ready for inspection.

3.18 PROTECTION OF COATING SYSTEMS

- A. Protect surfaces of coating systems from damage during construction.

3.19 ONE-YEAR INSPECTION

- A. Owner will set date for one-year inspection of coating systems.
- B. Inspection shall be attended by Owner, Contractor, Engineer, and manufacturer’s representative.
- C. Repair deficiencies in coating systems as determined by Engineer in accordance with manufacturer’s instructions.

3.20 SCHEDULES

- A. Coating System Schedule: All new construction and equipment shall be painted unless otherwise indicated. Items to be painted shall include, but not be limited to, concrete block, gypsum board, concrete walls, ceilings, metal doors and frames, window frames, miscellaneous metals, pumps, valves, fittings and equipment. Colors shall be selected by the Owner.
- B. Color Schedule: The following color schedule shall be used on all piping. The color of piping not listed below shall be selected from the color chart supplied by the manufacturer.

Item	Color
Raw Water	110GN Clover
Settled or Clarified Water	10GN Aqua Sky
Finished or Potable Water	11SF Safety Blue
Alum/Primary Coagulant	04SF Safety Orange
Ammonia	11WH White
Carbon Slurry	35GR Black
Caustic	02SF Safety Yellow with 09SF Safety Green band
MIOX Solution	02SF Safety Yellow
Fluoride	25BLFountainbleu with 06SF Safety Red Band
Lime Slurry	37GN Irish Spring
Ozone	02SF Safety Yellow with 04SF Safety Orange band
Phosphate Compounds	37GN Irish Spring with 06SF Safety Red band
Polymers or Coagulant Aids	04SF Safety Orange with 09SF Safety Green band
Potassium Permanganate	14SF Purple Rain/Safety
Soda Ash	37GN Irish Spring with 04SF Safety Orange band
Sulfuric Acid	02SF Safety Yellow with 06SF Safety Red band
Sulfur Dioxide	37GN Irish Spring with 02SF Safety Yellow band

Compressed Air	91GN Balsam
Gas	28RD Monterrey Tile
Other Lines	32GR Light Gray
Hoists/Trolleys	02SF Safety Yellow
Fire Protection	06SF Safety Red
Alum Sludge	84BR Weathered Bark
Salt/Brine Solution	32 GR Light Gray with 68BR Twine Band
Backwash Waste	68BR Twine
Membrane Permeate	39BL Delft Blue
Solution Tank Fill Lines	39BL Delft Blue
Solution Tank Drain/Fill & Recirculation Lines	06BR Amber Canyon
Solution Tank Process Lines	40BR Muley
Backpulse Lines	01BR Warm Sun
Other Lines	As selected by Engineer

END OF SECTION

**SECTION 11310
SUBMERSIBLE LIFT STATIONS**

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The General Contractor shall furnish, install, test and place in satisfactory operation, as shown on the Plans and specified, three (3) submersible lift stations and shall include six (6) submersible pumps, appurtenances, accessories, and spare parts as will be required to produce a complete and workable installation. To maintain unit responsibility, the pump control systems shall be furnished by the pump manufacturer as described herein.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 02530 for Piping
- B. Section 03480 for Precast Structures (wet well)
- C. Section 15200 for Valves & Appurtenances

1.03 REFERENCES

- A. American Society for testing and material (ASTM) International
 - 1. A 48: Standard Specification for Gray Iron Castings.
 - 2. A743: Standard Specification Iron-Chromium Nickel, Corrosion Resistant,
- B: American National Standards Institute (ANSI):
 - 1. B16.1: Standard for Cast Iron Pipe Flanges and Flanged Fittings, 125 lb.
- C. Hydraulic Institute: Current Standards.
 - 1. HI 14.6: Hydrodynamic Pumps for Hydraulic Performance Acceptance Tests.
 - 2. HI 11.6: Submersible Pump Tests

1.04 SUBMITTALS

- A. Submittal data shall be provided to show compliance with these specifications, plans or other specifications that will influence the proper operation of the pump(s).

- B. Standard submittal data for approval must consist of:
1. Pump Performance Curves showing Total Dynamic Head, Pump Efficiency, Brake Horsepower, Power Input to Electric Drive Motor of Pumping Unit for the various conditions under which the units are to operate along with descriptive data and specifications describing in detail the construction of the complete units.
 2. Pump Outline Drawing showing all weights and dimensions necessary for the installation of pumps, foundations, anchor bolts, piping and valve connections.
 3. Station Drawing for Accessories.
 4. Electrical Motor Data.
 5. Typical Installation Guides.
 6. Technical Manuals and Parts List.
 8. Printed Warranty.
 9. Management system certificate ISO 9001.
 10. Manufacturer's Equipment Storage Recommendations.
 11. Manufacturer's Standard Recommended Start-Up Report Form.
- C. Lack of the above requested submittal data is cause for rejection.

1.05 QUALIFICATION REQUIREMENTS

- A. The manufacturer shall provide experience information. Only Manufacturers with 20 or more years of experience will be accepted. The manufacturer shall have a minimum of five installations of the combination of pump and motor model proposed to be furnished for this project. Installations must be in operation for a minimum of five years and shall list the pump model, motor model and horsepower, date of installation, duty point, and contact information including telephone number. A list of these installations shall be furnished to the Engineer with submittals.
- B. After installation, a pump station start-up shall be performed on each individual lift station by the installing contractor under the supervision of the manufacturer's authorized representative. 24 hours of field service over 3 trips shall be provided by an authorized, factory-trained representative of the pump manufacturer. Services shall include, but not be limited to, inspection of the completed pump station installation to ensure that it has been performed in accordance with the manufacturer's instructions and recommendations, supervision of all field-testing and activation of the Pump Manufacturer's Warranty. The test shall demonstrate to the satisfaction of the Owner that the equipment meets all specified performance criteria, is properly installed and anchored, and operates smoothly without exceeding the full load amperage

rating of the motor. The Contractor shall be responsible for coordinating the required field services with the Pump Manufacturer.

PART 2 - MATERIALS

2.01 MANUFACTURERS

A. Manufacturer:

Sewage pumps shall be manufactured by Flygt Xylem, or pre-approved equal.

Any pump manufacturer, other than specified, proposing to offer the following equipment must submit sufficient information to the Engineer to determine that the equipment complies with the requirements of the Contract Documents. This information must be received by the Engineer not less than 15 days prior to the Bid Date. The Engineer will issue an addendum prior to the bid date which lists any pre-approved equipment. Contractors and manufacturers are advised that a manufacturer named as an approved supplier is not excused from meeting all of the technical and performance requirements of this specification. The pre-bid qualification package shall include complete pump performance data, evidence of compliance with the installation experience requirements of this Section and a letter from an officer of the company of the pump manufacturer listing all exceptions to the specifications.

B. Pump Performance:

Required pump performance for the three (3) submersible lift stations to be rehabilitated are as follows:

LIFT STATION #2

Number of Pumps:	2
Duty Point Flow (gallons per minute):	2,650 GPM
Total dynamic head at rating point (T.D.H):	148 FT TDH
Static head (ft)	78 FT
Minimum Shutoff Pressure	215 FT
Discharge	8 INCH DIA.
Minimum Hydraulic Efficiency at rating point:	65 %
Motor Power	3 PH, 480V, 60 Hz
Maximum Nominal Motor HP:	160 HP
Maximum Motor Speed	1800 RPM
Basis of Design	Flygt NP 3231

LIFT STATION #6

Number of Pumps:	2
Duty Point Flow (gallons per minute):	200 GPM
Total dynamic head at rating point (T.D.H):	175 FT TDH
Static head (ft)	58 FT
Minimum Shutoff Pressure	265 FT
Discharge	4 INCH DIA.
Minimum Hydraulic Efficiency at rating point:	40 %
Motor Power	3 PH, 480V, 60 Hz
Maximum Nominal Motor HP:	35 HP
Maximum Motor Speed	3600 RPM
Basis of Design	Flygt NP 3171

LIFT STATION #26

Number of Pumps:	2
Duty Point Flow (gallons per minute)	105 GPM
Total dynamic head at rating point (T.D.H):	68 FT TDH
Static head (ft)	32 FT
Minimum Shutoff Pressure	98 FT
Discharge	3 INCH DIA.
Minimum Hydraulic Efficiency at rating point:	49 %
Motor Power	3 PH, 230V, 60 Hz
Maximum Nominal Motor HP:	4 HP
Maximum Motor Speed	3600 RPM
Basis of Design	Flygt NP 3085

Each pump (LS #2, #6, and/or #26) shall be capable of operation without any limitation between 50% and 125% of the best efficiency point (B.E.P) of the performance curve.

2.02 PUMP CONSTRUCTION

A. GENERAL

The sewage pumping units shall be vertical, non-clogging, centrifugal sewage pumps with bottom inlet and side discharge. The hydraulics of each pump shall be capable of handling raw domestic wastewater and storm water with fibrous materials like wet wipes. The submersible pumps shall have a semi open multi vane self-cleaning impeller design. The pumps shall be direct driven by integral squirrel cage, electric induction motors. Each pump shall include a quick removal system, electrical cables, and all accessories specified herein.

B. CONSTRUCTION

1. Major pump components shall be of grey cast iron, ASTM A-48, Class 35B, with smooth surfaces devoid of blow holes or other irregularities. The materials of construction shall be as follows:
 - a. Pump housing: ASTM A-48, Class 35B
 - b. Impeller and insert ring: A 532 ALLOY III A (25% Chrome)
 - c. Cooling jacket: ASTM A-48, Class 35B
 - d. Stator housing: ASTM A-48, Class 35B
 - e. Shaft: ASTM A479 S43100-T.
 - f. Shaft seal: Pump side: - Corrosion resistant Tungsten carbide WCCR
 - g. Shaft seal Motor side: - Corrosion resistant Tungsten carbide WCCR or Carbon-Aluminum oxide (AL₂O₃)
2. The lifting handle shall be of stainless steel. All exposed nuts or bolts shall be of stainless-steel construction.
3. All castings must be blasted before coating. All wet surfaces are to be coated with two-pack oxyrane ester Duasolid 50. The total layer thickness should be at least 120 microns. Zink dust primer shall not be used.
4. The impeller blades shall be self-cleaning upon each rotation as they pass across a sharp relief groove in the Insert ring and shall keep the impeller blades clear of debris. The clearance between the insert ring and the impeller leading edges shall be adjustable.
5. Due to the presence of sand and/or grit in the wastewater flows, the impeller shall be made of high chromium cast iron with at least 24% chrome. Impellers that have surface hardening (by thermal, coating, etc.) will not be allowed.

6. The impeller shall be mounted on the motor shaft. Couplings or gear boxes shall not be accepted.
7. Sealing of the pumping unit to the discharge connection shall be accomplished by a machined metal to metal watertight contact. Sealing of the discharge interface with a diaphragm, O-ring or profile gasket will not be acceptable.
8. It shall be possible to lift and lower the pumps on parallel guide bars and connect them to wet well mounted discharge connection. There shall be no need for personnel to enter the wet well when removing or reinstalling the pumps.
9. At Lift Stations #6 and #26, the housing of each pump shall be prepared for the assembling of a sump mixing valve.
10. The pump shall be Explosion approved according FM CLASS 1. DIV 1 "C" & "D"
11. The cable entry shall consist of dual cylindrical elastomer sleeves, flanked by washers, all having a close tolerance fit against the cable and the cable entry. Epoxies, silicones, or other secondary sealing systems shall not be considered acceptable.
12. Bearings:
 - a. Lift Station #2: The pump shaft shall rotate on at least three grease-lubricated bearings. The upper bearing, provided for radial forces, shall be a single roller bearing. The lower bearings shall consist of at least one roller bearing for radial forces and one or two angular contact ball bearings for axial thrust. The minimum L10 bearing life shall be 100,000 hours at any point along the usable portion of the pump curve at maximum product speed. The lower bearing housing shall include an independent thermal sensor to monitor the bearing temperature. If a high temperature occurs, the sensor shall activate an alarm and shut the pump down. The bearings shall be insulated for VFD operation.
 - b. Lift Station #6 and #26: The pump shaft shall rotate on two bearings. Motor bearings shall be permanently grease lubricated and have a nominal L10 lifetime of 50,000 hours. The upper bearing shall be a

single deep groove ball bearing. The lower bearing shall be a two-row angular contact bearing to compensate for axial thrust and radial forces. Single row lower bearings are not acceptable.

13. Shaft Seals:

- a. Lift Station #2: The shaft seal shall be a positively driven dual, tandem mechanical shaft seal system consisting of two seals, each having an independent spring system. The seal is in a separate lubricant chamber and is lubricated and cooled by environmental friendly medical white oil. The lubricant chamber shall be designed to prevent over-filling and shall provide capacity for lubricant expansion. It shall have one drain and one inspection plug that are accessible from the exterior of the motor unit. The seal system shall not rely upon the pumped media for lubrication. The seals shall require neither maintenance nor adjustment and shall be capable of operating in either clockwise or counterclockwise direction of rotation without damage or loss of seal function. The rotating inner seal ring shall have small back-swept grooves laser inscribed upon its face to act as a micro pump as it rotates, returning any fluid that should enter the dry motor chamber back into the lubricant chamber. Shaft seals without positively driven tandem mechanical seal or conventional double mechanical seals that are either carried out with a common single or double spring are not accepted. Any leakage passing the sealing shall not pass the bearings. Before it reaches the bearings the liquid shall create an alarm via the floating leakage sensor.

- b. Lift Station #6: Each pump shall be provided with a positively driven dual, tandem mechanical shaft seal system consisting of two seal sets, each having an independent spring. The lower primary seal, located between the pump and seal chamber, shall contain one stationary and one positively driven rotating corrosion and abrasion resistant tungsten-carbide ring. The upper secondary seal, located between the seal chamber and the seal inspection chamber shall be a leakage-free seal. The upper seal shall contain one stationary and one positively driven rotating corrosion and abrasion resistant tungsten-carbide seal ring. The rotating seal ring shall have small back-swept grooves laser inscribed upon its face to act as a pump as it rotates, returning any fluid that should enter the dry motor chamber back into the lubricant chamber. All seal

rings shall be individual solid sintered rings. Each seal interface shall be held in place by its own spring system. The seals shall not depend upon direction of rotation for sealing. Mounting of the lower seal on the impeller hub is not acceptable. Shaft seals without positively driven rotating members or conventional double mechanical seals containing either a common single or double spring acting between the upper and lower seal faces are not acceptable. The seal springs shall be isolated from the pumped media to prevent materials from packing around them, limiting their performance. Any leakage passing the sealing shall not pass the bearings. Before it reaches the bearings the liquid shall create an alarm via the floating leakage sensor.

Each pump shall be provided with a lubricant chamber for the shaft sealing system. The lubricant chamber shall be designed to prevent overfilling and to provide lubricant expansion capacity. The drain and inspection plug, with positive anti-leak seal shall be easily accessible from the outside. The seal system shall not rely upon the pumped media for lubrication. Seal lubricant shall be non-hazardous. Where a seal cavity is present in the seal chamber, the area about the exterior of the lower mechanical seal in the cast iron housing shall have cast in an integral concentric spiral groove. This groove shall protect the seals by causing abrasive particulate entering the seal cavity to be forced out away from the seal due to centrifugal action.

- c. Lift Station #26: The shaft shall be sealed by a tandem mechanical shaft seal system consisting of two seals, each having an independent spring system. The seals shall require neither maintenance nor adjustment and shall be capable of operating in either clockwise or counterclockwise direction of rotation without damage or loss of seal function.

Each pump shall be provided with a lubricant chamber for the shaft sealing system. The lubricant chamber shall be designed to prevent overfilling and to provide lubricant expansion capacity. The drain and inspection plug, with positive anti-leak seal shall be easily accessible from the outside. The seal system shall not rely upon the pumped media for lubrication. Seal lubricant shall be non-hazardous.

2.03 MOTORS

A. SUBMERSIBLE MOTORS

1. The pump motor shall be induction type with a squirrel cage rotor, shell type design, housed in an air filled, watertight chamber. It shall be permanently submersible according standard IEC 60034 and protection class IP 68.
2. Motor cooling:
 - a. Lift Station #2: The motor of the pump shall be provided with cooling jacket and cooled by the pumped liquid. The impeller back vanes shall pump the cooling liquid with a velocity of at least 0,5m/s to avoid sedimentation of small particles in the cooling system. Two cooling liquid supply pipes, one discharging low and one discharging high within the jacket, shall supply the cooling liquid to the jacket. An air evacuation tube shall be provided to facilitate air removal from within the jacket. Two cooling liquid return ports shall be provided. The internals to the cooling system shall be non-clogging by virtue of their dimensions. The cooling jacket shall be equipped with two flanged and bolted inspection ports of not less than 4"Ø located 180° apart.
 - b. Lift Station #6: The motor shall be provided with an integral motor cooling system. A stainless-steel cooling jacket shall encircle the stator housing, providing for dissipation of motor heat regardless of the type of pump installation. An impeller, integral to the cooling system and driven by the pump shaft, shall provide the necessary circulation of the cooling liquid through the jacket. The cooling liquid shall pass about the stator housing in the closed loop system in turbulent flow providing for superior heat transfer. The cooling system shall have one fill port and one drain port integral to the cooling jacket.
3. The pump shall be capable of operating in a continuous condition in a liquid with a temperature up to 104°F even when the motor is not submerged.
4. Motor Starts:
 - a. Lift Station #2: The motor shall be capable of no less than 15 evenly spaced starts per hour and be able to operate throughout

the entire pump performance curve from shut-off through run-out.

- b. Lift Station #6: The motor shall be capable of no less than 30 evenly spaced starts per hour and be able to operate throughout the entire pump performance curve from shut-off through run-out.
- c. Lift Station #2: The motor shall be capable of no less than 15 evenly spaced starts per hour and be able to operate throughout the entire pump performance curve from shut-off through run-out.

- 5. The stator shall be insulated according to moisture resistant Class H rated for 356°F.
- 6. The junction chamber containing the terminal board shall be hermetically sealed from the motor by an elastomeric compression seal. Connection between the cable conductors and stator leads shall be made with threaded compression type binding posts permanently affixed to a terminal board.
- 7. The motor and the pump shall be produced by the same manufacturer.
- 8. Motor Protection:
 - a. Lift Station #2: The motor shall be protected by following sensors:
 - 3 bi-metal Thermal switches for thermal control of the stator
 - 1 PT 100 thermal sensor (RTD) to monitor the stator temperature of 1 Winding
 - 1 PT 100 thermal sensor (RTD) to monitor the temperature of the main bearing
 - 1 Vibration sensor to monitor vibration on 3 axes from 10 – 600 Hz.
 - 1 float switch in leakage chamber to monitor leakage in the leakage chamber.
 - 1 float switch in the terminal connection housing to monitor any leakage thru the cables and the cable entries.

- b. Lift Station #6: The motor shall be protected by 3 thermal switches embedded in the stator set to open at 284°F (140°C) and one leakage sensor floating type located in a leakage chamber below the main bearing. The sensor and the switches shall be connected to the control panel which shall stop the motor and send an alarm when the sensors are activated.
 - c. Lift Station #26: The motor shall be protected by 3 thermal switches embedded in the stator set to open at 260°F and one leakage sensor floating type located in the stator chamber. The sensor and the switches shall be connected to the control panel which shall stop the motor and send an alarm when the sensors are activated.
9. Lift Station #2 ONLY: The pump shall be supplied with a Pump electronic module (PEM) mounted inside the motor. The PEM shall collect, store and digitize all measurement from all sensors and shall communicate the data in a digital format via 2 control leads integral to the pump power cable to a Base unit mounted in a pump control cabinet to the Central control unit. The signals from the sensors shall be digital and transferred by just 2 leads within the motor cable. An additional pilot cable shall not be allowed. The PEM shall have information about the pump as well as features for startup and service support, such as:
- Pump serial number and other data plate information.
 - Specific configuration of monitoring functions for the actual pump such as alarm limits, delays, reset types, etc.
 - Counters by which the system can generate service reminders in accordance with the service policy specified in the pump manual.
 - Operating data and alarm history to analyze the condition of the pump and enable troubleshooting and reporting.
 - Accumulated running time and number of starts.
 - Pump duty rate (percentage of operation).
10. Each motor shall be equipped with 32 feet of screened cable suitable for submersible pump applications. The power cable shall be sized according

to NEC and ICEA. The outer jacket of the cable shall be oil resistant chlorinated polyethylene rubber. The motor and cable shall be capable of continuous submergence underwater without loss of watertight integrity *of a minimum depth* of 65 feet.

11. Each completed and assembled pump/motor unit shall undergo the following factory tests at the manufacturer's plant prior to shipment. The Manufacturer shall provide on demand a copy of his quality control plan for these tests and an ISO 9001 factory certificate:

- Minimum 3-point hydraulic performance test
- No-Leak seal integrity test
- Electrical integrity test

2.04 EQUIPMENT FOR WET WELL INSTALLATION – LIFT STATIONS #2 AND #6

- A. Replacement pumps at Lift Stations #2 and #6 will utilize existing guide bars and discharge connections.
- B. The pump(s) shall be capable of automatically and firmly connecting to the existing discharge elbows using the existing guide bars. There shall be no need for personnel to enter the wet-well.
- C. The entire weight of the pump/motor unit shall be borne by the pump discharge elbow. No portion of the pump/motor unit shall bear on the sump floor directly.
- D. Each pump shall be fitted with **30** feet of stainless-steel lifting chain or lifting cable. The working load of the lifting system shall be 50% greater than the pump unit weight.

2.05 EQUIPMENT FOR WET WELL INSTALLATION – LIFT STATION #26

- A. For each pump the contractor shall supply and install a discharge connection made of cast iron ASTM A-48, Class 35B.
- B. The outlet flange of the discharge connection shall be **3"** drilled according ANSI B16.1-89; tab.5.
- C. The pump(s) shall be automatically and firmly connected to the discharge connection, guided by no less than two parallel guide bars extending from the

top of the station to the wet well mounted discharge connection. The material of the guide bars shall Stainless steel AISI 316.

- D. The length of the guide bars shall **15** feet and they shall be fastened at the top of the station with a guide bar holder made of Stainless steel AISI 316.
- E. For each pump the contractor shall supply and install a cable holder made with 4 hooks of Stainless steel AISI 316.
- F. There shall be no need for personnel to enter the wet-well.
- G. The sealing of the pumping unit to the discharge connection shall be accomplished by a machined metal to metal contact. Sealing of the discharge interface with a diaphragm, O-ring or profile gasket will not be accepted. The entire weight of the pump/motor unit shall be borne by the pump discharge elbow. No portion of the pump/motor unit shall bear on the sump floor directly or on a sump floor mounted stand.
- H. The pump manufacturer shall provide a discharge elbow capable of mating to the 3" pump discharge and a 4" riser pipe.
- I. Each pump shall be fitted with **30** feet of stainless-steel lifting chain or lifting cable. The working load of the lifting system shall be 50% greater than the pump unit weight.

2.06 SUMP MIXING VALVE (LIFT STATION #6 AND #26)

- A. One pump unit in each pump station shall be equipped with an automatically operating flush valve mounted directly to the pump volute. During the starting the valve shall redirect a portion of the pumped media into the sump to re-suspend solids and grease by the turbulent action of its discharge.
- B. The valve shall be equipped with an adjustable, wear-resistant discharge nozzle that can be used to direct flow within the sump. The valve shall operate by differential pressure across the valve and shall not require any electric or pneumatic power source to operate. The valve shall be suitable for use in Class I, Division 1 hazardous locations.
- C. The valve shall open at the beginning of each pumping cycle and shall automatically close during the pump operation after a pre-set time. A method of adjusting the valve operating time shall be provided.

- D. The flush valve shall be Flygt 4901 or equivalent.

2.07 SUBMERSIBLE CABLE CONNECTION BOX (INTEX, RALSTON OR SIMILAR)

- A. The submersible cable of the pump shall be connected to the cable from the Control panel in a floor or wall mounted cable connection box to ease the installation and disassembling of the pumps and keep the submersible cables as short as possible.
- B. The cable connection box shall be submersible NEMA 6P (IP 68) to secure that no water can enter the motor via the cables even when the complete area is flooded.

2.06 ACCESS HATCHES

- A. LIFT STATION #2: Two new 36" x 54" access hatches will be provided for the two new pump locations as shown in the plans. The single leaf access hatches shall be equal to Halliday Products Series S1R. Hatches shall have a ¼" thick one-piece, mill finish, extruded aluminum channel frame, incorporating a continuous concrete anchor and a safety gate in place when hatch is open. Door panel shall be ¼" aluminum diamond plate, reinforced to withstand a live load of 300 psf. uniform live load with a maximum allowable deflection of 1/150 of the span. Door shall open to 90 degrees and automatically lock with a T-316 stainless steel hold open arm with an aluminum release handle. Door shall close flush with the frame. Hinges and all fastening hardware shall be T-316 stainless steel. Unit shall lock with a non-corrosive locking bar and have a non-corrosive handle. Unit shall carry a lifetime guarantee against defects in material and/or workmanship.
- B. LIFT STATION #6: Existing Access Hatches will be utilized.
- C. LIFT STATION #26: Access Hatches shall be provided for Lift Station #26 as shown in the drawings. Double leaf access hatches shall be equal to Halliday Products Series W2R and shall be sized by and provided by pump vendor at the proper size for easy pump removal. Hatches shall have a ¼" thick one-piece, mill finish, extruded aluminum channel frame, incorporating a continuous concrete anchor and a safety gate in place when hatch is open. A 1 ½" drainage coupling shall be located in the front left corner of the channel frame. Door panel shall be ¼" aluminum diamond plate, reinforced to withstand a live load of 300 psf. uniform live load with a maximum allowable deflection of 1/150 of the span. Door shall open to 90 degrees and automatically lock with a T-316 stainless steel hold open arm with an aluminum release handle. Door shall close flush with the frame. Hinges and all fastening hardware shall be T-316 stainless steel. Unit shall lock

with a non-corrosive locking bar and have a non-corrosive handle. Unit shall carry a lifetime guarantee against defects in material and/or workmanship.

2.08 PUMP CONTROL SYSTEMS

- A. Lift Station #2 will be provided with a Triplex Control Panel for operation of two new pumps as specified in section 2.01, B above along with one existing 160 HP Flygt NP3231/665 model pump. The control panel will be provided by the pump manufacturer and will be as specified on the electrical drawings.
- B. Lift Station #6 will be provided with a Duplex Control Panel for operation of two new pumps as specified in section 2.01, B above. The control panel will be provided by the pump manufacturer and will be as specified on the electrical drawings.
- C. Lift Station #26 will be provided with a Duplex Control Panel for operation of two new pumps as specified in section 2.01, B above. The control panel will be provided by the pump manufacturer and will be as specified on the electrical drawings.

PART 3 - EXECUTION

3.01 WARRANTY

- A. The pumps shall be provided with a prorated 60 months (5 years) warranty against defects in materials and or workmanship. Unless otherwise specified, all other equipment shall be warrantied for 12 months (1 year). The warranty shall be in printed form and previously published as the manufacturer's standard warranty for all similar units manufactured, latest revision. Upon warranty occurrence, the manufacturer's authorized service center shall remove the pump, repair, reinstall and provide start up on the repaired pump. A detailed failure analysis shall be submitted to the Owner for their records summarizing corrective action taken.
- B. The manufacturer shall guarantee clog-free operation for a period of 12 months from the date of start-up of the pumps by the local authorized factory representative. A certificate shall be provided to the Owner on the day of start up with the local contact information and effective date. If the impeller clogs with typical solids or modern trash debris normally found in domestic wastewater during this period, an authorized representative shall travel to the

jobsite, remove the pump, clear the obstruction and reinstall the pump at no cost for the Owner. A written report shall be provided to the Owner detailing the service call with pictures for verification purposes.

3.02 FACTORY TESTING

A. General Tests

1. Mechanical and electrical integrity tests in accordance with ANSI/HI 11.6 shall be performed. All motors shall be megger tested before and after the performance tests.
2. All pumps shall be hydrostatically tested. The test pressure shall be a hydrostatic head of at least 150 percent of the rated shutoff head held for at least 5 minutes.

B. Project Specific Hydraulic Tests - Lift Station #2 Pumps Only

1. Run each pump at full rating point for a minimum of 15 minutes prior to start of any testing. Pumps shall be tested in the configuration used for this project—wet pit pumps shall be submerged and dry pit pumps shall be tested in a dry pit configuration.
2. Provide certified performance curves for each pump. Pump tests to be evaluated to ANSI/HI Acceptance Level A.
3. Each pump test shall include a minimum of six points between shut-off and run-out points. One of the six points shall be the “Duty Point Flow”. One of the six points shall also be the “Secondary Rating Point”. Complete information shall be taken to determine flow, head, motor speed, horsepower and hydraulic efficiency.
4. Should the pumps tested fail to meet the requirements of the specifications, the pump Manufacturer shall modify and/or replace the original pumps with equipment and re-test the pumps at no additional cost to the Owner. Should the Manufacturer be unable to provide pumping equipment that will meet the requirements of the specifications, the Contractor shall furnish pumps of differing manufacture as directed by the engineer. Such rejection shall not increase the contractor’s completion time or subject the Owner to any additional cost.

3.03 FIELD QUALITY CONTROL

- A. The following field tests shall be performed by a factory trained technician
 - 1. Point to point wiring verification
 - 2. Utility power verification
 - 3. Site acceptance testing
 - 4. System Demonstration

- B. Point to Point I/O Verification
 - 1. After installation of the pumps and the control panel, a factory trained technician shall prepare the I/O checklist. The checklist shall include the following:
 - a. All inputs and outputs connected to the control panel
 - b. All alarms that can be generated by the control panel
 - 2. The technician shall follow a test procedure to test all I/O and alarms.
 - a. All digital inputs shall be tested from point of origin unless it is unsafe.
 - b. All digital outputs shall be tested by running a simulation test from the controller or by simulating the fault condition.
 - c. All analog inputs shall be tested from the point of origin where possible and by use of a signal generator otherwise.
 - d. All analog outputs shall be tested by running a simulation program or by forcing the output to a value.
 - 3. The technician shall follow a test procedure to ensure the system operation parameters are met.

- C. Configuration Verification
 - 1. The factory trained technician shall document the settings using a factory provided configuration checklist. Each parameter shall be verified prior to the beginning of testing and then again after testing is completed.
 - 2. The configuration of the pump station manager as well as the IPS gateways shall be documented.
 - 3. The pump station manager configuration shall be saved to a factory provided SD card after testing is completed.

3.04 FACTORY TRAINED SUPERVISION

- A. The contractor shall procure a factory trained technician to check over equipment prior to putting the equipment into operation.
- B. Point to point test of all wiring.
- C. Functional test of all equipment alarms and controls.

3.05 CERTIFICATION OF TESTING

- A. All tests shall be performed in the presence of a duly authorized representative of the Owner. If the presence is waived, certified results shall be provided by the Contractor.
- B. Written notice of all tests shall be given two weeks in advance.

3.06 TEST EQUIPMENT

- A. All test equipment shall be provided by the Contractor.

3.07 TRAINING

- A. Training shall be a minimum of four (4) hours and cover the complete Pumping System and related controls.
- B. Instruction material shall be provided for four (4) trainees.

3.08 ANNUAL PREVENTATIVE MAINTENANCE AGREEMENT

- A. Training In addition to the pump(s) the supplier shall provide a minimum one-year preventative maintenance agreement that includes a minimum of one annual site visit with a multi-point pump(s) inspection performed by manufacturer certified and manufacturer trained technician(s) within 12 months of installation.
- B. The multi-point inspection shall include visual and functional inspections of all wet well components, pumps and control panels; oil inspection and oil change of submersible pumps; pertinent physical and electrical data to reasonably expect prolonged equipment operation for a year of additional service.

- C. The end-user shall also be provided a copy of a summarized report at the conclusion of the multi-point inspection.

3.08 SERVICE & SPARE PARTS

- A. The manufacturer shall furnish one set of the following spare parts:
 - 1. Impeller and casing wear rings
 - 2. Mechanical seal set, both upper and lower sets
 - 3. Upper and Lower Bearings set
 - 4. O-Ring Set
- B. The pump manufacturer shall have a factory certified service center within a 150-mile radius of the pump installation.
- C. A complete replacement pump or any and all pump replacement parts shall be available for delivery within 1 week of notification to the manufacturer of such requirement by the owner.

END OF SECTION

**SECTION 11350
PERMANENT BYPASS PUMP**

PART 1 - GENERAL

1.01 PROJECT SCOPE

- A. Requirements for providing a diesel-driven, compressor-assisted horizontal sewage back-up pump for permanent installation.

1.02 GENERAL

- A. GENERAL SPECIFICATIONS: Units described shall be new, unused and of the current years production. The style of pump being bid must be in production for a minimum of five (5) years (Include users list). Unit shall be of the latest design and in current production completely serviced, ready for work and shall include all standard and optional equipment as specified herein. All bidders must have demonstrated the unit they are bidding prior to bid date.
- B. The manufacturer of the diesel pump must have a fully stocked parts and service facility within 150 miles of the *City of Vidalia*. The service facility shall employ a field service technician(s) available for 24/7 service calls, and have a rental fleet of similar pump models. The *City* shall have the right to inspect the office and shall be the sole judge of its adequacy to fulfill this requirement.

1.03 SYSTEM DESCRIPTION

- A. The pumpset specified in this section will be used to pump raw sewerage/wastewater.
- B. Pump shall be fitted with a fully automatic priming system capable of repeated priming from a completely dry pump casing.
- C. The pump and accessories shall be supplied by the pump manufacturer.
- D. The pump offered shall have been in continuous use by municipal and industrial owners for a minimum of **five (5) years**. A list of five user contacts including contact names and telephone numbers shall be provided with the bid submittal. Failure to supply a verifiable users list will be cause for rejection of the bid.

PART 2 - PRODUCTS

2.01 CENTRIFUGAL PUMP

- A. The Centrifugal pump shall be a horizontal end suction solids handling centrifugal pump model.
- B. The pump casing shall be constructed of cast iron BS EN 1561-1997.
- C. Wearplates shall be cast iron chrome 1.0/1.5% and nickle 2%.
- D. The impeller shall be constructed of cast steel BS3100 A5 hardness to 200 HB Brinell.
- E. The mechanical seal shall have a silicon carbide face with viton elastomers and a stainless steel body.
- F. The pump shaft shall be constructed of carbon steel BS 970.
- G. The pump inlet shall be equipped with a 12" 125-lb ANSI flange connection.
- H. The pump outlet shall be equipped with a 10" 125-lb. ANSI flange connection.

2.02 DESIGN REQUIREMENTS

- A. All design requirements listed below must be clearly displayed on performance pump curves. These performance pump curves shall be based on testing standards established by the hydraulic institute.
- B. Performance Requirements

PERFORMANCE REQUIREMENTS	
IMPELLER DIAMETER (INCHES)	17.3
SUCTION PIPING SIZE (INCHES)	12
DISCHARGE PIPING SIZE (INCHES)	10
OPERATING SPEED (MAXIMUM) (RPM)	2,000
MAXIMUM SOLIDS HANDLING (Inches)	3
MAXIMUM FLOW CAPABILITY (GPM)	5,200
MAXIMUM HEAD CAPABILITY (TDH)	400
PRIMARY PERFORMANCE DUTY POINT (GPM at TDH)	3,000 at 159'
MAXIMUM STATIC SUCTION LIFT AT PRIMARY DUTY POINT (FT)	17
MIMUMUM EFFICIENCY AT PRIMARY DUTY POINT (%)	72

2.03 ACCEPTABLE MANUFACTURERS

- A. Provide a 12 inch, compressor-assisted horizontal sewage pump driven by a water-cooled diesel engine. The pump shall be fully automatic, self-priming from dry conditions and capable of handling large volumes of air, water, and solids. The pump set specified in this section will be used to pump wastewater from a City of Vidalia pumping station (PS).
- B. The By-pass pump shall be model HL250M as manufactured by Godwin, or pre-approved equal.

2.04 PRIMING SYSTEM

- A. The priming system shall be fully automatic eliminating the need to pre-fill the pump casing with water to achieve initial prime.
- B. The priming system shall be capable of automatically priming the pump with a 28-foot static suction lift with no water in the pump or suction piping.

2.05 DIESEL ENGINE

- A. The engine shall be Caterpillar model C15, 475 HP @ 2000 rpm.
- B. The engine shall have an industrial type battery with 175-amp hour rating and minimum 990 cold-cranking amps, with 175 amp reserve, mounted in a lockable frame.
- C. A 12-volt starter and alternator charging system shall be provided.
- D. Engine shall have an industrial-style muffler with rain cap.
- E. Engine shall have an electrical type governor.
- F. Engine shall have an integrated block heater for cold weather use.
- G. Engine shall have variable speed throttle control, via manual or auto float operation.
- H. Engine shall have safety shutdown switches for low oil pressure and high temperature.
- I. An instrument panel shall be provided in an enclosure and mounted on rubber isolators.

2.06 MODULAR MOUNTING FRAME/FUEL TANK

- A. The complete power unit shall be mounted on a combination frame/double wall fuel

tank constructed of tubular steel, approximate length 162 inches, approximate width 70 inches, with a fuel capacity of 240 US gallons.

- B. Double walled fuel tank shall include an audible alarm when diesel fuel level reaches 90% full.
- C. Modular double walled fuel tank shall include a primary wall leak sensor to indicate any breach in the primary diesel fuel containment.
- D. The modular frame shall incorporate an integral lifting bail capable of lifting the entire unit.
- E. Modular fuel tank shall have two clean-out ports located at opposite ends of the tank.
- F. Modular fuel tank shall incorporate welded steel mounting tabs with 7/8" holes and rubber vibration isolation pads to secure the pump to the concrete pad.
- G. Modular fuel tank shall have a removable basket strainer mounted in the fill port and a lockable cap.

2.07 CONTROL PANEL

- A. An automatic engine controller shall be provided to start and stop the diesel engine in response to varying liquid levels via float switches or a 4-20 mA transducer.
- B. The automatic start-stop engine controller shall be part of the main instrument panel. Multiple control panels shall not be considered.
- C. The automatic engine controller shall be housed inside a UL Certified, NEMA 4x enclosure.
- D. The automatic engine controller display shall be fully visible, day or night, without the need to open the housing listed above.
- E. The automatic engine controller shall contain the RS485 and J1939 communication ports.
- F. The automatic engine controller shall be mounted on rubber shock mounts.
- G. The system shall contain a safety back-up feature allowing the unit to be operated manually and retain safety shutdown protection in the event of automatic engine controller failure.
- H. The automatic engine controller shall be fully field programmable and contain pass code

protection.

- I. The automatic engine controller shall contain automatic and manual start modes.
- J. Records up to 32 events related to warning lights
- K. The automatic engine controller shall have programmable relays.
- L. Sixty (60) selectable features
- M. The automatic start-stop system shall contain two mechanically activated hermetically sealed liquid level control floats; one to turn the pump on and one to turn the pump off. Single float designs that are prone to frequent cycling leading to excessive component wear shall not be considered.
- N. The floats shall be clearly marked, top or bottom, for easy installation into wet well. Floats shall be provided with 65-feet of cable.
- O. The two floats shall be connected together with a single pin terminal for easy connection to control box.
- P. The pump shall include a lockable stainless steel enclosure mounted to the outside of the sound enclosure incorporating labeled SCADA interface dry contact connections. Each dry contact will monitor pre-set alarm conditions within the pump set, and will be hard-wired by the installation contractor. The SCADA interface will consist of 6 coil based relays, SPDT, 12VDC/24VDC input. Output terminal strip for each signal required, 12VDC/24VDC. SCADA Interface shall monitor the following N/O alarms:
 - i. Pump Start
 - ii. Low Battery Charge
 - iii. Low Fuel Level
 - iv. Inner Wall Fuel Leak
 - v. Pump Start Failure: (in auto mode and failed to start)
 - vi. High Level

2.08 OPTIONS FOR STATIONARY BY-PASS PUMPS

- A. **120V BATTERY CHARGER:** The pump set shall be equipped with a 10 amp, 120vac/12vdc,60Hz battery charger. The charger shall be fully automatic, and meet ISO 8846 Marine and Ignition protection standards. The charger shall be able to fully charge the battery in less than 12 hours. Existing AC power at the lift station shall be wired directly to a single 15 amp outlet, mounted on the lifting bail. This AC power outlet shall be used for the battery charger and blockheater.
- B. **LEVEL TRANSDUCER:** The unit shall be supplied with (1) one Teflon diaphragm sewage

compatible level transducer assembly including a single 4-20 mA level transducer with leveling guard (0-15 psig), which shall integrate with the engine control panel via a single multi-pin plug.

- C. **OUTSIDE WORK LIGHTS:** The pump set shall be equipped with (2) switch operated 12VDC LED lights, mounted to the lifting bail.
- D. **AUTO THROTTLE:** The unit/s shall include one (1) automatic throttle controller integrated into (2) relays in the engine control panel. The auto-throttle control panel combination shall allow the pump to ramp up to the target RPM given a start command and ramp down to idle given a stop command in auto start mode.

2.09 PAINTING

- A. A minimum 1-3 mil thick layer of Industrial Acrylic Enamel primer shall be factory applied to the entire pump set prior to the finish coat.
- B. A minimum 2-3 mil thick layer of Industrial Acrylic Enamel Paint shall be factory applied over the primer coat.

PART 3 – EXECUTION

3.01 FACTORY TESTING

- A. The complete pump set shall be factory tested according to ANSI/HI 1.61994 by a certified quality technician. The pump shall be sound tested according to ISO 3744, ANSI/HI9.4 and CPB Sound Level Measurement Standard.

3.02 TOOLS AND SPARE PARTS

- A. The manufacturer shall furnish the following with the emergency back-up pumpset system:
 - 1. A recommended list of spare parts.
 - 2. A recommended list of tools.
- B. The manufacturer shall be able to demonstrate an ability to provide 24-hour parts availability. Manufacturers not stocking replacement pump parts for this model pump will be cause for rejection.

3.02 MANUFACTURERS SERVICES

- A. The manufacturer shall furnish the services of a competent factory representative to do

the following:

1. Inspect the system prior to delivery, supervise the start-up and testing of the system, and certify the system has been properly furnished and is ready for operation. A complete Start Up Report shall be provided to the city's representative for review and final approval.
2. Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day after installation is complete.

3.03 OPERATIONS AND MAINTENANCE MANUALS

- A. The pump O&M manual shall include, but not be limited to, exploded views of pump components, operation, maintenance instructions, and spare parts lists giving manufacturer's stock or part number for each replaceable item.
- B. Provide (2) spiral bound hard copy of pump O&M manual and (2) spiral bound hard copies of engine O&M manual.
- C. Provide (1) electronic copy of both the engine and pump O&M manuals on a flash drive.
- D. Hard copies and flash drive will be placed inside a rainproof document box, furnished with the unit.

3.05 WARRANTY

- A. A copy of the engine manufacturer's parts and labor warranty.
- B. The manufacturer of the pumping unit shall warrant for a period of (1) year from the date of final acceptance or 18 months from the date of shipment that the entire unit and all equipment therein, including seals, shall be free from defects in design, material, and workmanship. Warranty registration forms must be included with the Operation and Maintenance Manuals.

SECTION 15200
VALVES AND APPURTENANCES

PART 1 – GENERAL

1.01 SCOPE

- A. Furnish all labor, materials, equipment and incidentals required and install complete and ready for operation all valves and appurtenances as shown on the Drawings and as specified herein.
- B. All valves complete with pneumatic or manual operators as required shall be furnished by a single manufacturer and shall be coordinated with instrumentation and controls.

1.02 RELATED WORK

- A. Piping is included in Division 2.

1.03 DESCRIPTION OF SYSTEMS

- A. All of the equipment and materials specified herein are intended to be standard for use in controlling the flow of water, sludge, chemicals, etc., depending on the applications.

1.04 QUALIFICATIONS

- A. All of the types of valves and appurtenances shall be products of well established reputable firms who are fully experienced, reputable and qualified in the manufacture of the particular equipment to be furnished. The equipment shall be designed, constructed and installed in accordance with the best practices and methods and shall comply with these specifications as applicable.

1.05 SUBMITTALS

- A. Submit to the Engineer within 30 days after execution of the contract a list of materials to be furnished, the names of the suppliers and the date of delivery of materials to the site.
- B. Complete shop drawings of all valves and appurtenances shall be submitted to the Engineer for approval in accordance with the requirements by Section 01300 and the General Conditions.

1.06 TOOLS

- A. Special tools, if required for normal operation and maintenance shall be supplied with the equipment.

PART 2 - PRODUCTS

2.01 GENERAL

- A. All valves and appurtenances shall be of the size shown on the drawings shall be from one manufacturer.
- B. All valves and appurtenances shall have the name of the maker and the working pressure for which they are designed cast in raised letters upon some appropriate part of the body.

2.02 GATE VALVES:

- A. All gate valves shall be NSF/ANSI 61 certified and constructed from materials conforming to AWWA C509. Gate valves shall be designed for a working pressure of not less than 200 psi and shall take full pressure on either face. Valves shall be hydrostatically tested in accordance with AWWA C509.
- B. Gate Valves 3" to 12" in size shall be resilient-seated with a non-rising stem. Valves shall be provided with a 2" square operating nut and shall be right hand closed valves. The valves shall be taken from one manufacturer and similar sizes shall have interchangeable parts.
- C. All integral and external surfaces shall be coated with epoxy to a minimum thickness of 8 mils and meeting the requirements of ANSI/AWWA C550. Valve disks shall be coated with a rubber material conforming to AWWA C509 so that there shall be no metal to metal contact when the valve is in the fully closed position.

Valves shall be manufactured by Mueller Co., American-Darling Corp., or M & H Valve.

2.03 CHECK VALVES

- A. Check Valves shall be Surgebuster® Swing Check Valves or approved equal suitable for cold working pressures of 250 psig in water, wastewater, abrasive,

and slurry service. The check valve shall be of the full body type, with a domed access cover and only two moving parts, the flexible disc and the disc accelerator.

- B. The valves shall be designed, manufactured and tested in accordance with American Water Works Association Standards ANSI/AWWA C508. Manufacturer shall have a quality management system that is certified to ISO 9000 by an accredited, certifying body.
- C. Valves shall be provided with flanges in accordance with ANSI B16.1, Class 125.
- D. The valve body shall be full flow equal to nominal pipe diameter at all points through the valve. The seating surface shall be on a 45 degree angle to minimize disc travel. A threaded port with pipe plug shall be provided on the bottom of the valve to allow for field installation of a backflow actuator, air cushion or hydraulic cushion without special tools or removing the valve from the line. The top access port shall be full size, allowing removal of the disc without removing the valve from the line. The access cover shall be domed in shape to provide flushing action over the disc for operating in lines containing high solids content. A threaded port with pipe plug shall be provided in the access cover to allow for field installation of a mechanical, disc position indicator.
- E. The disc shall be of one-piece construction, precision molded with an integral o-ring type sealing surface, and contain alloy steel and nylon reinforcement in the flexible hinge area. The flex portion of the disc shall be warranted for twenty five years. Non-Slam closing characteristics shall be provided through a short 35 degree disc stroke and a disc accelerator to provide a cracking pressure of 0.3 psig. The disc accelerator shall be of one piece construction and provide rapid closure of the valve in high head applications. The disc accelerator shall be enclosed within the valve and shall be field adjustable and replaceable without removal of the valve from the line. The disc accelerator shall be securely held in place by being captured between the cover and disc. It shall be formed with a large radius to allow smooth movement over the disc surface.
- F. The manufacturer shall demonstrate a minimum of five (5) years experience in the manufacture of resilient, flexible disc check valves with air and hydraulic cushions. All valves shall be hydrostatically tested and seat tested to demonstrate zero leakage. When requested the manufacturer shall provide test certificates, dimensional drawings, parts list drawings, and operation and maintenance manuals. The exterior and interior of the valve shall be coated with an ANSI/NSF 61 approved fusion bonded epoxy coating. Color of finish coat shall be sewer pipe green to match pipe
- G. Surgebuster® Swing Check Valves shall be Series #7200 as manufactured by Val-Matic® Valve & Manufacturing Corporation, Elmhurst, IL, USA, or approved equal.

2.04 PLUG VALVES

- A. Plug valves shall be 100% Port Eccentric Plug Valves designed to meet the following standards:
- AWWA C517-05 Resilient-Seated Cast-Iron Eccentric Plug Valve, quarter-turn
 - ANSI flange drilled conforms to ANSI B16.1, Class 125. MJ joint end connections conform to ANSI/AWWA C11 1/A21.11.
- B. Plug valve shall have a direct pressure, weatherproof nut actuator for buried use or chairwheel/chain where specified. Non-buried valves shall be handwheel or lever operated as space requires.
- C. Valve bodies and covers shall be constructed of ASTM A126 Class B cast iron for working pressures up to 175 psig and ASTM A536 Grade 65-45-12 for working pressures up to 250 psig.
- D. Plugs shall be made of one-piece construction and made of ASTM A126 Class B cast iron or ASTM A536 Grade 65-45-12 ductile iron and fully encapsulated with resilient facing per ASTM D2000-BG and ANSI/AWWA C517 requirements.
- E. Interior and exterior of the valve shall be coated with an ANSI/NSF 61 approved fusion bonded epoxy. Color of finish coat shall match pipe.
- F. Plug valves shall be series #5600R or #5700R manufactured by Val-matic or approved equal.

2.05 VALVE BOXES

- A. All buried valves shall have cast iron two or three piece valve boxes with cast iron covers. Valve boxes shall be provided with suitable heavy bonnets and to extend to such elevation at or slightly above the finished grade surface as directed by the Engineer. The barrel shall be one or two-piece, screw type, having 5-1/4-inch shaft. Covers shall have "WATER" cast into the top for all water mains and "DRAIN" cast into the top of all drain line. All valves shall have actuating nuts extended to within six inches of the top of valve box cover.
- B. Valve boxes shall be provided with concrete base and valve nameplate with suitable anchors for casting in concrete. Nameplate shall be 3-inch diameter bronze disk with raised lettering 1/8-inch high as shown on the Drawings and manufactured by Shiedow Bronze Corporation, Kingwood, W. VA; or equal.

2.06 FLANGED ADAPTORS

- A. Flanged adaptors where shown on the Drawings shall be "Uni-Flange" as manufactured by Uni-Flange Corporation, Series 400.
- B. Flange shall be ductile iron designed to meet the requirements of ANSI D16. Set screw shall be AISI 4140 steel, heat treated, zinc
- C. Where shown on the Drawings adaptor shall be harnessed.

2.07 FLEXIBLE COUPLINGS

- A. Flexible couplings shall be either the split type or the sleeve Type as shown on The Drawings or needed to make connections as directed by the engineer.
 - 1. Split type coupling shall be used with all interior piping and with exterior piping as noted on the Drawings. The couplings shall be mechanical type for radius groove piping. The couplings shall mechanically engage and lock grooved pipe ends in a positive couple and allow for angular deflection and contraction and expansion.
 - 2. Couplings shall consist of malleable iron, ASTM Specification A47, Grade 32510 housing clamps in two or more parts, a single chlorinated butyl composition sealing gasket with a "C" shaped cross-section and internal sealing lips projecting diagonally inward, and two or more oval track head type bolts with hexagonal heavy nuts conforming to ASTM Specification A183 and A194 to assemble the housing clamps. Bolts and nuts shall be 316 Stainless Steel.
 - 3. Victaulic type couplings and fittings may be used in lieu of flanged joints if approved by the Engineer. Pipes shall be radius grooved as specified for use with the Victaulic couplings. Flanged adapter connections at fittings, valves, and equipment shall be Victaulic Vic Flange Style 741, equal by Gustin-Bacon Group, Division of Certain-Teed Products, Kansas City, Kansas, or equal.
 - 4. Sleeve type couplings shall be used where shown on the Drawings. The couplings shall be of steel and shall be Dresser Style 38, Smith Blair Style 413, Baker Allsteel, or equal. The coupling shall be provided with 316 Stainless Steel bolts and nuts unless indicated otherwise.
 - 5. All couplings shall be furnished with the pipe stop removed.
 - 6. Couplings shall be provided with gaskets of a composition suitable for exposure to the liquid within the pipe.

7. If the Contractor decides to use victaulic couplings in lieu of flanged joints, he shall be responsible for supplying supports for the joints.

2.08 HOSE BIBBS

- A. "Hose Bibbs" shall be Post type, one inch, non freezing hydrant, suitable for 2' bury as manufactured by Zurn, Josam or equal. Bibbs shall have a bronze casing, bronze interior parts and non-turning operation rod with free-floating compression closure valve. The bib shall be equipped with a tapped drain port in the valve housing and 18 inch long decorative cast aluminum shield around casing.

2.09 PRESSURE GAUGES

- A. Pressure Gauges shall be installed on the discharge piping of all pumps proposed for this project. Each pressure gauge shall be direct mounted, polished stainless steel case with a 3--1/2-inch diameter dial and furnished with an acrylic plastic window, 1/4-inch shut-off valve, and be glycerin filled with bronze or stainless steel tube. All gauges shall be weatherproofed. The face dial shall be white finished aluminum with jet black graduations and figures. The face dial shall indicate the units of pressure being measured (e.g. feet, inches, etc.) or be dual scale. Socket material shall be bronze.
- B. Pressure gauges shall be equal to Ashcroft Model 1009, or approved equal. Ranges shall be suitable to the application and will be as approved by the Engineer.

2.10 PIPE SLEEVE SEALS

- A. A watertight seal at all wall sleeves shall be obtained using expandable rubber seal rings equal to Link-Seal as shown on the Drawings. These seal rings shall be the modular mechanical type consisting of synthetic rubber links shaped to continuously fill the annular space between the pipe and wall sleeve. Links shall be loosely assembled with bolts to form a continuous rubber belt around the pipe with a pressure plate under each bolt head and nut. After the seal assembly is positioned in the sleeve, tightening of the bolts shall cause the rubber sealing sleeve. The watertight seal shall be effective against a hydrostatic head of at least 40 feet. The seal shall also be constructed so as to provide electrical insulation between the pipe and wall, thus reducing chances of cathodic reaction between these two members.

2.11 AIR VALVES

- A. Wastewater Combination Air Valves shall be infinitely variable automatic combination air and vacuum valves suitable for wastewater applications. Valves shall allow the

escape of air for an operating pressure range of 0-250 psi. Valve shall close water tight when liquid enters the valve even when the fluid is rising without pressure (no minimum operating pressure required) and allow air to enter in the event of a vacuum. Water hammer shall be inhibited through soft working behavior of roll-on diaphragm and spring mechanism. There shall be no contact between fluid and the valves sealing area. Valve body shall be steel with manufacturer's factory applied epoxy powder coating, and spindle shall be 316 stainless steel. The valve seat and working parts shall be made of corrosion- resistant materials. Valve shall include all necessary attachments including ball valve and cam-lock fitting for back flushing after installation. Wastewater combination air valves shall be of the size and type shown on the plans by H-TEC, Inc., A.R.I. USA, Inc. or approved equal.

2.12 MAGNETIC FLOWS METERS

- A. Meter shall incorporate microprocessor technology to offer very low flows and broad range ability. The accuracy shall be plus or minus 0.5% of actual flow. The meter shall provide rate of flow and total volume outputs to the SCADA system.
- B. The fabricated tube shall be stainless steel with stainless steel flanges and lined with and NSF approved, fusion bonded epoxy material. The meter shall be suitable for pressures of up to 150 psi.
- C. The meter may be installed horizontally or vertically, but must have a full pipe of liquid for proper operation. Fluid shall be grounded to the downstream flange of the sensor either via internal grounding electrodes or using grounding rings. The manufacturer's recommendations shall be followed with regard to distance from elbows, valves, and tees both up and downstream of the unit.
- D. The meter shall include dual 4-20mA analog outputs, an optional RS485 port, and a local display in enclosure suitable for proposed installation location. Power supply shall be 100-240 VAC. Power and control wiring between the sensor and converter shall be isolated in separate cables.
- E. The magnetic flowmeter shall be and UltraMag model manufactured by McCrometer or approved equal. A 2 year warranty shall be provided.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. All valves and appurtenances shall be installed in the locations shown, true to alignment and rigidly supported. Any damage to the above items shall be repaired to the satisfaction of the Engineer before they are installed.

- B. After installation, all valves and appurtenances shall be tested at least 2 hours at the working pressure corresponding to the class of pipe, unless a different test pressure is specified. If any point proves to be defective, it shall be repaired to the satisfaction of the Engineer.
- C. Install all floor boxes, brackets, extension rods, guides, the various types of operators and appurtenances as shown on the Drawings that are in masonry floors or walls, and install concrete inserts for hangers and supports as soon as forms are erected and before concrete is poured. Before setting these items, the Contractor shall check all plans and figures which have a direct bearing on their location and he shall be responsible for the proper location of these valves and appurtenances during the construction of the structures.
- D. Pipe for use with flexible couplings shall have plain ends as specified in the respective pipe sections in Division 15.
- E. Flanged and mechanical joints under water or exposed to weather shall be made with type 304 stainless steel bolts, nuts and washers.
- F. Prior to assembly of split couplings, the grooves as well as other parts shall be thoroughly cleaned. The ends of the pipes and outside of the gaskets shall be moderately coated with petroleum jelly, cup grease, soft soap or graphite paste, and the gasket shall be slipped over one pipe end. After the other pipe has been brought to the correct position, the gasket shall be centered properly over the pipe ends with the lips against the pipes. The housing sections then shall be placed. After the bolts have been inserted, the nuts shall be tightened until the housing sections are firmly in contact, metal-to-metal, without excessive bolt tension.
- G. Prior to the installation of sleeve-type couplings, the pipe ends shall be cleaned thoroughly for a distance of 8 inches. Soapy water may be used as a gasket lubricant. A follower and gasket, in that order, shall be slipped over each pipe to a distance of about 6 inches from the end, and the middle ring shall be placed on the already laid pipe end until it is properly centered over the joint. The other pipe end shall be inserted into the middle ring and brought to proper position in relation to the pipe already laid. The gaskets and followers shall then be pressed evenly and firmly into the middle ring flares. After the bolts have been inserted and all nuts have been made up finger tight, diametrically opposite nuts shall be progressively and uniformly tightened all around the joint, preferably by use of a torque wrench of the appropriate size and torque for the bolts.
- H. Pressure gauges shall not be installed until after the substantial completion date unless otherwise requested by the Owner.

- I. Valve boxes with concrete bases shall be installed as shown on the Drawings. Mechanical joints shall be made in the standard manner. Valve stems shall be vertical in all cases. Place cast iron box over each stem with base bearing on compacted fill and top flush with final grade. Boxes shall have sufficient bracing to maintain alignment during backfilling. Knobs on cover shall be parallel to pipe. Remove any sand or undesirable fill from valve box.

3.02 SHOP PAINTING

- A. Ferrous surfaces of valves and appurtenances shall receive an exterior coating of rust-inhibitive primer and provided with finish coating as specified on the plans. Interior coatings shall be the manufacturer's standard except that valves on raw and potable water lines shall be coated with paints approved by both EPA and AWWA for potable water service. All pipe connection openings shall be capped after shop painting to prevent the entry of foreign matter prior to installation.

3.03 FIELD PAINTING

- A. All metal valves and appurtenances specified herein and exposed to view shall be shop primed and painted as specified on the plans. All exposed pipe joints on pipe, valves and fittings shall be caulked 360 degrees prior to painting. Where surfaces have been shop painted but have been damaged during delivery to site, storage, and/or assembly, or where the shop coats have deteriorated, these surfaces shall be properly cleaned and retouched or repainted with matching paint per the manufacturer's recommendation.

3.04 INSPECTION AND TESTING

- A. Completed pipe shall be subjected to hydrostatic pressure tests for four (4) hours at full working pressure. All leaks shall be repaired and lines retested as approved by the Engineer. Prior to testing, the gravity pipelines shall be supported in an approved manner to prevent movement during tests.

END OF SECTION