

Gas Easement Remediation

CONTRACT DOCUMENTS AND SPECIFICATIONS

PREPARED FOR:

City of Warner Robins



City of Warner Robins Bid No: 26-U-4788

PREPARED BY:



5/22/2026

Project No. 015.13.3.26
May 2026

SPECIFICATIONS & CONTRACT DOCUMENTS

FOR

GAS EASEMENT REMEDIATION

FOR

CITY OF WARNER ROBINS

MAY 2026

GWES PROJECT NO. 015.13.3.26

TABLE OF CONTENTS

DIVISION 00 – PROCUREMENT AND CONTRACTING SPECIFICATIONS

00100	Invitation to Bid
00200	Instruction to Bidder
00400	Bid Form
00410	Bid Bond
00420	Bidder's Qualifications
00422	Corporate Certificate
00425	Contractor's License Certification
00480	Non-Collusion Affidavit
00483	Contractor E-Verify
00484	Sub-Contractor E-Verify
00500	Contract Agreement
00550	Pre-Award Oath
00610	Performance Bond
00620	Payment Bond
00621	Notice of Award
00622	Notice to Proceed
00700	General Conditions
00800	Supplementary Conditions

DIVISION 01 – GENERAL SPECIFICATIONS

011000	Summary of Work
012000	Price and Payment Procedures
012500	Substitution Procedures
013000	Administrative Requirements
013216	Construction Progress Schedule
013300	Submittal Procedures
014000	Quality Requirements
014529	Testing Laboratory Services

015000	Temporary Facilities and Controls
015616	Dust Control
015633	Job Site Security
016000	Product Requirements
017000	Execution and Closeout Requirements
017123.13	Construction Layout
017400	Cleaning and Waste Management
017836	Warranties

DIVISION 03 – CONCRETE

034000	Precast Concrete
036000	Grouting

DIVISION 31 – EARTHWORK

310519	Geotextiles for Earthwork
312319	Dewatering
312333	Trenching and Backfilling
312500	Erosion and Sedimentation Control
313716.13	Rubble-Stone Riprap

DIVISION 32 – EXTERIOR IMPROVEMENTS

329113	Soil Preparation
329119	Landscape Grading
329219	Seeding

DIVISION 33 – UTILITIES

334200	Stormwater Conveyance
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SECTION 00100
INVITATION TO BID

PART 1: GENERAL

1.1 Competitive Cost Sealed Bids

Separate sealed Bids for construction of **Gas Easement Remediation for the City of Warner Robins (Bid Number 26-U-4788)** will be received until Thursday, July 9, 2026 at 11:00 a.m. in the Purchasing Office at City Hall, 700 Watson Blvd, Warner Robins, Georgia 31093. Bids will then be publicly opened and read aloud at said office. Any bid received after Thursday, July 9, 2026 at 11:00 a.m. will not be considered by the Owner. Following the closing time for the receipt of bids no bid may be withdrawn for a period of sixty (60) days.

1.2 Scope of Work

The work to be performed and provided under this Contract shall consist of furnishing all labor, materials, tools, equipment, safety equipment, permitting, erosion and sedimentation control measures, taxes, profit, overhead, and other costs and effort required to complete the following:

Installation of approximately 144 L.F. of 36" reinforced concrete pipe (RCP) for nine (9) culvert crossings, nine (9) RCP flared end sections with trash racks, 270 S.Y. of type 3 riprap, access drive improvements to include installation of 4,000 S.Y. of 200-lb woven fabric and 720 TN of #4 surge stone, and associated grading and erosion and sedimentation control. The time allotted for final completion of work is **90 consecutive calendar days**.

Contractor will be required to coordinate all work with the City of Warner Robins and other utility owners who have facilities within the project corridor. The project will be managed by GWES, LLC. located at 733 Carroll Street, Perry, GA, 31069, telephone number (706) 765-8767.

All Work shall be completed in accordance with the plans and specifications. The Work will be awarded in one (1) Contract.

1.3 Plans, Specifications and Contract Documents

The Instructions to Bidders, Bid Forms, Contract Agreement, Drawings, Specifications and forms of Bid Bond, Performance Bond, Payment Bond, and other Contract Documents may be obtained upon payment (non-refundable) of \$200 from:

GWES, LLC.
733 Carroll Street
Perry, GA 31069
(706) 765-8767

1.4 Business License/Occupational Tax Certificate

Contractor shall a supply business license/occupational tax certificate with the Bid.

1.5 Bonds

Each Bid must be accompanied by a Bid Bond or certified cashier's check, in the amount of 10% of the base bid, prepared on the form of Bid Bond, section 00410, attached to the Contract Documents or a Surety Company's Standard Bid Bond, duly executed by the Bidder as principal and having as surety thereon a surety company licensed to do business in the State of Georgia and listed in the latest issue of U.S. Treasury Circular 570 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". Each Bond shall be accompanied by a "Power of Attorney" empowering the attorney-in-fact to bind the surety and certified to include the date of the bond.

1.6 Pre-Bid Meeting

A non-mandatory pre-bid meeting will be held on Thursday, June 25, 2026 at 10:00 a.m. at the project location on Adams Road in Twiggs County, GA. Attendees shall meet at the property entrance at 32.571285, -83.519389°.

1.7 Permits

The City of Warner Robins is responsible for Section 404 Clean Water Act Permitting through the U.S. Army Corps of Engineers. Contractor will acquire all remaining necessary Federal, State and local permits preceding the issuance of the Notice to Proceed.

1.8 Easements & Rights-of-Way

Owner has or will acquire all necessary easements and rights-of-way for permanent installations preceding the issuance of the Notice to Proceed.

1.9 Reservation of Rights

The Owner reserves the right to reject any or all Bids, to waive informalities and to re-advertise.

2.0 Contractor E-Verify

Contractor shall supply E-Verify documentation with the bid to be deemed responsive.

SECTION 00200
INSTRUCTION TO BIDDERS

1.01 *Contract Documents*

- A. The Contract Documents include the Contract Agreement, Invitation to Bid, Instructions to Bidders, Contractor's Bid (including all documentation accompanying the Bid and any post-Bid documentation required by the Owner prior to the Notice of Award), Bonds, all Special Conditions, General Conditions, Supplementary Conditions, Specifications, Drawings, Alternates, and addenda, together with written amendments, change orders, field orders and the Engineer's written interpretations and clarifications issued in accordance with the General Conditions on or after the date of the Contract Agreement.
- B. Shop drawing submittals reviewed in accordance with the General Conditions, geotechnical investigations and soils reports, and drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the site, are not Contract Documents.
- C. The Contract Documents shall define and describe the complete work to which they relate.

1.02 *Definitions*

- A. Where the following words or the pronouns used in their stead occur herein, they shall have the following meaning:
 - 1. "Owner" shall mean the City of Warner Robins, party of the first part to the Contract Agreement, or its authorized and legal representatives.
 - 2. "Engineer" shall mean CITY OF WARNER ROBINS's staff engineer(s) or CITY OF WARNER ROBINS's consultant engineers.
 - 3. "Contractor" shall mean the party of the second part to the Contract Agreement or the authorized and legal representative of such party.
 - 4. "Work" and "Project" shall mean the entire completed construction required to be furnished under the Contract Documents.
 - 5. "Contract Time" shall mean the number of consecutive calendar days as provided in the Contract Agreement for completion of the Project, to be computed from the date of the Notice to Proceed.
 - 6. "Liquidated Damages" shall mean the sum of \$500 per day which the Bidder agrees to pay for each consecutive calendar day beyond the Contract Time required to complete the Project. Liquidated Damages will end upon written notification from the Owner of final acceptance of the Project.
 - 7. "Products" shall mean materials or equipment permanently incorporated into the Project.
 - 8. "Provide" shall mean to furnish and install.
 - 9. "Balanced Bid" shall mean a Bid in which each of the unit prices and total amount bid for

each of the listed items reasonably reflects the value of that item with regard to the entire job considering the prevailing cost of labor, material and equipment in the relevant market. A Bid is unbalanced when, in the opinion of the Owner, any unit prices or total amounts bid on any of the listed items do not reasonably reflect such values.

10. "Substantial completion of the work", solely for the purposes of Official Code of Georgia Annotated (O.C.G.A.) §13-10-81(c), shall be defined as occurring on the date of the written notification from the Engineer that the Project is ready for final inspection, as specified in Section 00700, 14.04.

1.03 *Preparation and Execution of Bid*

- A. Each Bid must be prepared to represent that it is based solely upon the materials and equipment specified in the Contract Documents. Complete sets of the Bidding Documents are digitally available from GWES, LLC 733 Carroll Street, Perry, GA 31069 upon payment of \$200.
- B. Each Bid must be submitted on the Bid forms which are attached to the Contract Documents. All blank spaces for Bid prices, both words and figures, must be filled in, in ink. In case of discrepancy, the amount shown in words will govern. All required enclosed certifications must be fully completed and executed when submitted.
- C. Each Bid must be submitted in a sealed envelope, addressed to the Owner. Each sealed envelope containing a Bid must be plainly marked on the outside with the **Project Name and Bid Number. Each sealed bid must include section 00425 - Contractors License Certification.**
- D. The Bidder shall provide on the outside of the sealed envelope the following information, otherwise the Bid will not be opened and will be returned to the Bidder:
 1. **Bidder's Name (Business)**
- E. If forwarded by mail, the sealed envelope containing the Bid must be enclosed in another envelope addressed to the Owner at the address given in the Invitation to Bid.
- F. Any and all Bids not meeting the aforementioned criteria for Bid submittal, may be declared non-responsive, and subsequently returned to the Bidder.
- G. The Contractor, in signing a Bid on the whole or any portion of the Project, shall conform to the following requirements:
 1. Bids which are not signed by individuals making them shall have attached thereto a power of attorney evidencing authority to sign the Bid in the name of the person for whom it is signed.
 2. Bids which are signed for a partnership shall be signed by all of the partners or by an attorney-in-fact. If a Bid is signed by an attorney-in-fact, there should be attached to the Bid a power of attorney executed by the partners evidencing authority to sign the Bid.
 3. Bids which are signed for a corporation shall have the correct corporate name thereof and the signature of the president or other authorized officer of the corporation manually

written below the corporate name following the wording "By _____". Corporation seal shall also be affixed to the Bid.

4. Bids which are signed for a limited liability company shall be executed in the name of the firm by a member and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm shall be shown.
5. The Bid shall contain evidence of Bidder's authority and qualification to do business in the state of Georgia, or Bidder shall covenant in writing to obtain such authority and qualification prior to award of the Contract and attach such covenant to the Bid. Bidder's state contractor license number, if any, shall also be shown on the Bid Form.

1.04 *Method of Bidding*

- A. The unit or lump sum price for each of the several items in the Bid of each Bidder shall include its pro rata share of overhead and profit so that the sum of the products, obtained by multiplying the quantity shown for each item by the unit price, represents the total Bid. Any Bid not conforming to this requirement may be rejected. Additionally, Unbalanced Bids will be subject to rejection. Conditional Bids will not be accepted. The special attention of all Bidders is called to this provision, for should conditions make it necessary to revise the quantities, no limit will be fixed for such increased or decreased quantities nor extra compensation allowed.
- B. The total of all estimated prices will be the sum of the products of the estimated quantity of each item and the corresponding unit price. The final quantities and Contract Price will be determined in accordance with paragraph 11.03 of the General Conditions.
- C. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum and any column of figures and the correct sum thereof will be resolved in the favor of the correct sum.

1.05 *Submittal of Bid*

- A. With each copy of the Bidding Documents, a Bidder is furnished one copy of the Bid Form, and the Bid Bond Form. The Bid Form is to be completed and submitted with the Bid security and the documents listed in Article 6 of the Bid Form (00400).
- B. A Bid shall be submitted no later than the date and time prescribed and at the place indicated in the advertisement or Invitation to Bid and shall be enclosed in an opaque sealed envelope plainly marked with the Project title, the name and address of Bidder and shall be accompanied by the Bid security and other required documents.
- C. Bids will only be accepted from entities that have received bidding documents from the Engineer.

1.06 *Modification and Withdrawal of Bid*

- A. A Bid may be modified or withdrawn without revealing the amount of the bid by submitting an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids.

- B. In accordance with O.C.G.A 36-91-52, if within forty-eight (48) 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.
1. Such error in the calculation of the bid can be documented by clear and convincing written evidence;
 2. Such error can be clearly shown by objective evidence drawn from inspection of the original work papers, documents or materials used in the preparation of the bid sought to be withdrawn.
 3. The bidder serves written notice upon the Owner either prior to the award of the contract or not later than forty-eight (48) hours after the opening of bids, excluding Saturdays, Sundays and legal holidays.
 4. The bid was submitted in good faith and the mistake was due to a calculation or clerical error, an inadvertent omission or typographical error as opposed to an error in judgment; and
 5. The withdrawal of the bid will not result in undue prejudice to the Owner or other bidders by placing them in a materially worse position than they would have occupied if the bid had never been submitted.

Thereafter, if the Work is rebid, that Bidder will be disqualified from further bidding on the Work. Furthermore, no Bidder who is permitted to withdraw a Bid shall for compensation be allowed to supply any material or labor, or perform any subcontract or other work agreement for, the person or firm to whom the contract is awarded or otherwise benefit, directly or indirectly, from the performance of the project for which the withdrawn Bid was submitted.

1.07 *Addenda and Interpretations*

- A. No interpretation of the meaning of the Drawings, Specifications or other pre-bid documents will be made to any Bidder orally.
- B. Every request for such interpretation should be made in writing and addressed to Todd Parker, GWES, LLC, 3030 Highway 11, Mansfield, Ga. 30055 or email at todd.parker@gwesllc.com , and to be given consideration must be received at least five (5) business days prior to the date fixed for opening Bids.
- C. Any and all such interpretations and any supplemental instructions will be in the form of written Addenda to the Contract Documents which, if issued, will be mailed, shipped or faxed to all prospective Bidders (at the respective addresses furnished) prior to the date fixed for the opening of Bids.
- D. Failure of Bidders to receive or acknowledge any Addendum shall not relieve them of any obligation under the Bid. All Addenda shall become part of the Contract Documents.

1.08 *Bid Security*

- A. Each Bid must be accompanied by a Bid Bond, prepared on the form of Bid Bond included herein or a Surety Company's Standard Bid Bond, duly executed by the Bidder as principal and having as surety thereon a surety company authorized to do business in the State of Georgia, listed in the latest issue of U.S. Treasury Circular 570 and with an "A" minimum rating of performance and a financial strength of at least five times the contract price as listed in the most current publication of "Best's Key Ratings Guide Property Liability", in the amount of ten (10) percent of the maximum amount bid. Attorneys-in-fact who sign Bonds must file with each Bond a currently dated copy of their power of attorney.
- B. If for any reason whatsoever the successful Bidder withdraws from the competition after opening of the Bids, or if Bidder refuses to execute and deliver the Contract and Bonds required within fifteen (15) consecutive calendar days after receipt of notice of the acceptance of Bid, the Owner may proceed to enforce the provisions of the Bid Bond.

1.09 *Receipt and Opening of Bids*

- A. The Owner may consider a minor irregularity any Bid not prepared and submitted in accordance with the provisions hereof and may waive any minor irregularities or reject any and all Bids. Any Bid may be withdrawn prior to the scheduled time for the opening of Bids or authorized postponement thereof. Any Bid received after the time and date specified shall not be opened.
- B. Bids will be opened at the time and place indicated in the Advertisement or Invitation to Bid and unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base bids and major alternates, if any, will be made available to Bidders after the opening of Bids.

1.10 *Subcontracts*

- A. The Bidder is specifically advised that any person, firm or other party to whom it is proposed to award a subcontract under this Contract must be acceptable to the Owner.

1.11 *Conditions of the Project*

- A. Each Bidder must be informed fully of the conditions relating to the construction of the Project and the employment of labor thereon. Failure to do so will not relieve a successful Bidder of the obligation to furnish all material and labor necessary to carry out the provisions of the Contract. Insofar as possible, the Contractor, in carrying out the work, must employ such methods or means as will not cause any interruption of or interference with the work of any other Contractor.
- B. The Bidder is advised to examine the location of the Project and to be informed fully as to its conditions; the conformation of the ground; the character, quality and quantity of the products needed preliminary to and during the prosecution of the work; the general and local conditions and all other matters which can in any way affect the work to be done under the Contract. Failure to examine the site will not relieve the successful Bidder of an obligation to furnish all products and labor necessary to carry out the provisions of the Contract.

- C. The Bidder shall notify the Owner of the date and time Bidder proposes to examine the location of the Project. The Bidder shall confine examination to the specific areas designated for the proposed construction, including easements and public right-of-ways. If, due to some unforeseen reason, the Owner's proceedings for obtaining the proposed construction site (including easements), have not been completed, the Bidder may enter the site only with the express consent of the property owner. The Bidder is solely responsible for any damages caused by examination of the site.

1.12 *Notice of Special Conditions*

If any special federal, state, county or city laws, municipal ordinances, and the rules and regulations of any authorities having jurisdiction over construction of the Project, enclosed, herein referred to, or applicable by law to the Project, conflict with requirements of the Contract Documents, then the most stringent requirement prevails.

1.13 *Obligation of Bidder*

By submission of a Bid, each Bidder warrants that Bidder has inspected the site and has read and is thoroughly familiar with the Contract Documents (including all addenda). The failure or omission of any Bidder to examine any form, instrument or document shall in no way relieve any Bidder from any obligation in respect to the Bid.

1.14 *Method of Award*

- A. The Contract will be awarded to the responsive, responsible Bidder submitting the Bid which is in the best interest of the Owner as determined by the Owner.
- B. The Bidder to whom the award is made will be notified. The Owner reserves the right to reject any and all Bids and to waive any minor irregularities in Bids received whenever such rejection or waiver is in the Owner's interest.
- C. A responsive Bidder shall be one who submits a Bid in the proper form without qualification or intent other than as called for in the Contract Documents, and who binds himself or herself on behalf of the Bid to the Owner with the proper Bid Bond completed and attached, and who properly completes all forms required to be completed and submitted at the time of the Bidding. The Bidder shall furnish all data required by these Contract Documents. Failure to do so may result in the Bid being declared non-responsive.
- D. A responsible Bidder shall be one who can fulfill the following requirements:
 - 1. The Bidder shall maintain a permanent place of business. This requirement applies to the Bidder where the Bidder is a division of a corporation, or where the Bidder is fifty (50) percent or more owned by a person, corporation or firm.
 - 2. The Bidder shall demonstrate adequate construction experience and sufficient equipment resources to properly perform the work under and in conformance with the Contract Documents. This evaluation will be based upon a list of completed or active projects and a list of construction equipment available to the Bidder to perform the work. The Owner may make such investigations as deemed necessary to determine the ability of the Bidder to perform the work, and the Bidder shall furnish to the Owner all such information and

data for this purpose as the Owner may reasonably request. The Owner reserves the right to reject any Bid if the evidence submitted by, or investigation of, such Bidder fails to satisfy the Owner that such Bidder is properly qualified to carry out the obligations of the Contract and to complete the Project contemplated therein.

3. The Bidder shall demonstrate financial resources of sufficient strength to meet the obligations incident to the performance of the work covered by these Contract Documents. The ability to obtain the required Performance and Payment Bonds will not alone demonstrate adequate financial capability.
- E. Acceptance of the Bidder's documentation and substantiation or Contract Award by the Owner does not relieve the Bidder of liability for non-performance as covered in the Contract Documents, nor will the Bidder be exempted from any other legal recourse the Owner may elect to pursue.

1.15 *Contract Security and Insurance*

- A. Article 5 of the General Conditions or as modified by the Supplementary Conditions, establishes the requirements for performance and payment bonds and insurance. When the successful Bidder delivers the executed agreement to Owner, it shall be accompanied by such bond documents and insurance certificates.

1.16 *Contractor and Subcontractor's Insurance*

- A. Contractor and all Subcontractor's shall not commence work under this contract until he has obtained all the insurance required by the Supplementary Conditions.

END OF SECTION 00200

SECTION 00400
BID FORM

TO: City of Warner Robins

FROM: _____

For: Gas Easement Remediation

DATED: _____

Article 1 – Bidder’s Acknowledgements

- 1.01 The undersigned Bidder, in compliance with your Invitation to Bid for the construction of this Project having examined the Contract Documents, the site of the proposed work, and being familiar with all of the conditions surrounding the construction of the proposed Project, including the availability of materials and labor, hereby proposes to construct the Project in accordance with the Contract Documents.
- 1.02 The Bidder proposes and agrees, if this Bid is accepted, to contract with the City of Warner Robins in the form of Contract Agreement specified, to furnish all necessary products, machinery, tools, apparatus, means of transportation and labor necessary to complete the construction of the Work in full and complete accordance with the reasonably intended requirements of the Contract Documents to the full and entire satisfaction of the City of Warner Robins with a definite understanding that no money will be allowed for extra work except as set forth in the Contract Documents.
- 1.03 The undersigned further agrees that in case of failure on his part to execute the said contract and the Bonds 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 in to 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.

Article 2 – Bidder’s Representations

2.01 In submitting this Bid, Bidder represents that:

- A. Bidder has examined and carefully studied the Bidding Documents, other related data identified in the Bidding Documents, and the following Addenda, receipt of which is hereby acknowledged:

Addendum No.

Addendum Date

- B. Bidder has visited and become familiar with the Site and is satisfied with the Site conditions that may affect cost, progress and performance of the Work.

- C. Bidder is familiar with and satisfied as to all Laws and Regulations that may affect cost, progress and performance of the Work.
- D. Bidder has carefully studied: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at or contiguous to the Site that have been identified in Part 6 of the Supplemental Conditions and (2) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in Part 6 of the Supplemental Conditions.
- E. Bidder has considered the information known to Bidder; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations and documents on (1) the cost, progress and performance of the Work; (2) the means, methods, techniques, sequences and procedures of construction to be employed by Bidder, including applying the specific means, methods, techniques, sequences and procedures of construction expressly required by the Bidding Documents; and (3) Bidder's safety precautions and programs.
- F. Based on the information and observations referred to in Paragraph 2.01.E above, Bidder does not consider that further examinations, investigations, explorations, tests, studies or data are necessary for the determination of this Bid for performance of the Work at the price(s) bid and within the times required and in accordance with the other terms and conditions of the Bidding Documents.
- G. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
- H. Bidder has given written notification to Engineer of all conflicts, errors, ambiguities or discrepancies that Bidder has discovered in the Bidding Documents and Bidder finds Engineers written resolution thereof acceptable.
- I. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.
- J. Bidder will submit written evidence of its Authority to do business in the State of Georgia prior to the date of execution of the Agreement.

Article 3 – Bidder's Certification

3.01 Bidder certifies that:

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

- B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;
- C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and
- D. Bidder has not engaged in corrupt, fraudulent, collusive or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:
 - 1. “corrupt practice” means the offering, giving, receiving or soliciting of any thing of value likely to influence the action of a public official in the bidding process;
 - 2. “fraudulent practice” means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of the Owner, (b) to establish bid prices at artificial non-competitive levels or (c) to deprive Owner of the benefits of free and open competition;
 - 3. “collusive practice” means a scheme or arrangement between two or more Bidders, with or without knowledge of Owner, with the purpose to establish bid prices at artificial, non-competitive levels; and
 - 4. “coercive practice” means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

Article 4 – Basis of Bid

4.01 The Contractor shall review Section 012000 Price and Payment Procedures for methods and limits for payments to the Contractor for the following pay items.

Item No.	Description	Unit	Quantity	Unit Price	Total Price
1.	Mobilization and Demobilization				
a.	Mobilization and Demobilization	1	LS		
2.	Earthwork				
a.	Grading Complete	1	LS		
b.	200-LB Woven Fabric	4,000	SY		
c.	#4 Surge Stone	720	TN		
3.	Erosion and Sedimentation Control				
a.	Double Row Type "S" Silt Fence (Sd1-S)	1,055	LF		
b.	Construction Exit (Co)	1	EA		
c.	Temporary Mulching (Ds1)	1.0	AC		

d.	Temporary Grassing (Ds2)	1.0	AC		
e.	Permanent Grassing (Ds3)	1.0	AC		
f.	Erosion Blanket (Ss)	484	SY		
4.	Storm Drain Infrastructure				
a.	36" Class 3 RCP	144	LF		
b.	36" RCP Flared End Sections w/ Trash Rack	9	EA		
c.	Type 3 Rip Rap w/Underlayment Fabric	270	SY		
5.	Allowances				
a.	Owner's Allowance	1	LS	\$25,000.00	
Total Base Bid				\$	

Total Base Bid (Total Items 1-5 in the amount of)

\$ _____
Dollars & Cents

Price in Words

Article 5 – Time of Completion

5.01 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 14.07 of the General Conditions within **ninety (90) consecutive calendar days** after the start day identified in the Notice to Proceed.

Bidder accepts the provision of the Agreement in regards to liquidated damages in the event the Bidder fails to complete the Work within the times specified in the Agreement.

Article 6 – Attachments to this Bid

6.01 Bidder shall submit the following documents with the Bid:

- A. Required Bid security in the form of ten (10) percent of the Total Base Bid;
- B. List of Proposed Subcontractors;
- C. List of Proposed Suppliers;
- D. List of Project References;

- E. Evidence of authority to do business in the State of Georgia;
- F. Utility Contractor License No. of Contractor performing the work or evidence of Bidder's ability to obtain a State Contractor's License and a covenant by Bidder to obtain said license within the time for acceptance of Bids;
- G. Statement of Bidder's Qualifications with supporting data (Section 00420);
- H. Corporate Certificate (Section 00422)
- I. Non-collusion Affidavit of Prime Bidder (Section 00480);
- J. Contractor's License Certification (Section 00425);
- K. Contractor Affidavit and Agreement (Section 00483);
- L. Subcontractor Affidavit of Employment Eligibility (Section 00484); and
- M. Pre-Award Oath (Section 00550)

Article 7 – Define Terms

- 7.01 The terms used in this Bid with the initial letter capitalized shall be defined as stated in the Instructions to Bidders, General Conditions and Supplementary Conditions.

Article 8 – Bid Communication

- 8.01 All communications regarding this bid shall be addressed to:

Todd Parker, P.E.
GWES, LLC.
3130 Highway 11
Mansfield, Ga 30055
Phone: (770) 570-9486
todd.parker@gwesllc.com

Article 9 – Bid Submittal

9.01 This bid is submitted by:

Bidder: _____

By: _____

Name: _____

Title: _____

Attest: _____

(SEAL)

Bidder's Business Address: _____

Phone No. _____ Fax No. _____

E-mail _____

Submitted on _____ 20____

Utility Contractor License No. of Contractor performing work: _____

END OF SECTION 00400

SECTION 00410
BID BOND

STATE OF GEORGIA

COUNTY OF HOUSTON

KNOW ALL MEN BY THESE PRESENTS, that we, _____, as Principal, and _____, as Surety, are held and firmly bound unto the City of Warner Robins, in the sum of Ten Percent (10%) of Principal's Bid lawful money of the United States of America, 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 City of Warner Robins's Gas Easement Remediation project.

NOW THEREFORE, the conditions of this obligation are such that if the Bid be accepted, the Principal shall, within fifteen (15) 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 Contract Documents and execute sufficient and satisfactory separate Performance and Payment Bonds payable to the Owner, each in an amount of one hundred (100) percent of the total Contract Price, in form satisfactory to the Owner, then this obligation shall be void; otherwise, it shall be and remain in full force and effect 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 36-91-1 *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 Principal has hereunder affixed its signature and seal, and said Surety has hereunto caused to be affixed its corporate signature and seal, by its duly authorized officers, on this ____ day of _____, 20__.

CONTRACTOR - PRINCIPAL: _____

By: _____
(Signature on File)

Title: _____

Address: _____

Phone: _____

Attest: _____
(Signature on File)

(SEAL)

Title: _____

Note: Attest for a corporation must be by the corporate secretary; for a partnership by another partner; for an individual by a notary.

SURETY: _____

By: _____
(Signature on File)

Title: _____

Phone: _____

Attest: _____
(Signature on File)

(SEAL)

Title: _____

Note: Surety companies executing bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the Project is located. Resident agent in state in which Work is to be performed:

Name: _____

Address: _____

Phone: _____

END OF SECTION 00410

SECTION 00420
STATEMENT OF BIDDER'S QUALIFICATIONS

To demonstrate Bidder's qualifications to perform the Work, each Bidder must be prepared to submit to the Owner the following:

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 Owner.
17. The undersigned authorizes and requests any person, firm or corporation to furnish any information requested by the Owner in verification of the recitals comprising the Statement of Bidder's Qualifications.
Dated at _____ this _____ day of _____, 20__.

All of the above questions must be answered and the date given must be clear and comprehensive. This statement must be notarized. If necessary, questions may be answered on separate attached sheets.

(Name of Bidder)

By: _____

Title _____

State of Georgia

County of _____

_____, being duly sworn deposes and says that he
is _____ of _____
(Name of Organization)

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____

END OF SECTION 00420

SECTION 00422
CORPORATE CERTIFICATE

I, _____, certify that I am the Secretary of the Corporation named as Contractor in the foregoing Bid; that _____, who signed said Bid on behalf of the Contractor was then _____ of said Corporation; that said Bid was duly signed for and on behalf of said Corporation by authority of its Board of Directors, and is within the scope of its corporate powers; that said Corporation is organized under the laws of the State of _____.

This _____ day of _____ 20____.

(Corporate Secretary) _____
(Signature on File)

(SEAL)

END OF SECTION 00422

SECTION 00425
CONTRACTOR'S LICENSE CERTIFICATION

Contractor's Name: _____

Georgia Business License Number: _____

Expiration Date of License: _____

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

Signed: _____
(Signature on File)

Date: _____

END OF SECTION 00425

SECTION 00480
NON-COLLUSION AFFIDAVIT OF PRIME BIDDER

STATE OF GEORGIA
COUNTY OF HOUSTON

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

He or she is _____ of _____, the Bidder that has submitted the attached Bid;

He or she is fully informed respecting the preparation and contents of the attached Bid and of all pertinent circumstances respecting such Bid;

Such Bid is genuine and is not a collusive or sham Bid;

Neither the said Bidder nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this Affiant, 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 Warner Robins or any person interested in the proposed Contract; and

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 Affiant.

Signed: _____
(Signature on File)

Title: _____

Subscribed and Sworn to before me this ____ day of _____.

(Notary Public)

My Commission Expires: _____, 20____

END OF SECTION 00480

SECTION 00483
CONTRACTOR AFFIDAVIT OF EMPLOYMENT ELIGIBILITY

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 on behalf of **City of Warner Robins**, has registered with, is authorized to use and uses the federal work authorization program commonly known as E-Verify, or any subsequent replacement program, in accordance with the applicable provisions and deadlines established in O.C.G.A. §13-10-91. Furthermore, the undersigned Contractor will continue to use the federal work authorization program throughout the contract period.

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 the **City of Warner Robins**, Contractor will secure from such subcontractor(s) similar verification of compliance with O.C.G.A. 13-10-91 Contractor further agrees to maintain records of such compliance and provide a copy of each such verification to the **City of Warner Robins** at the time the subcontractor(s) is retained to perform such service. Contractor hereby attests that its federal work authorization user identification number and date of authorization are as follows:

E-Verify Company ID Number

Date of Authorization

Name of Contractor

Gas Easement Remediation

Name of Project

I hereby declare under penalty of perjury that the foregoing is true and correct.

Executed on the ____ day of _____, 20__, in _____ (city), _____ (state).

Signature of Authorized Officer or Agent

Printed Name and Title of Authorized Officer or Agent

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

Notary Public

My Commission Expires: _____

END OF SECTION 00483

SECTION 00484
SUB-CONTRACTOR AFFIDAVIT OF EMPLOYMENT ELIGIBILITY

By executing this affidavit, the undersigned sub-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 for _____ (name of subcontractor with whom such sub-contractor has privity of contract) and _____ (name of contractor) on behalf of City of Warner Robins has registered with, is authorized to use and uses the federal work authorization program commonly known as E-Verify, or any subsequent replacement program, in accordance with the applicable provisions and deadlines established in O.C.G.A. § 13-10-91. Furthermore, the undersigned sub-contractor will continue to use the federal work authorization program throughout the contract period and the undersigned sub-contractor will contract for the physical performance of services in satisfaction of such contract only with sub-contractors who present an affidavit to the sub-contractor with the information required by O.C.G.A. § 13-10-91(b). The undersigned sub-contractor shall submit, at the time of such contract, this affidavit to _____ (name of sub-contractor with whom such sub-contractor has privity of contract). Additionally, the undersigned sub-contractor will forward notice of the receipt of any affidavit from a sub-contractor to _____ (name of sub-contractor with whom such subcontractor has privity of contract). Sub-contractor hereby attests that its federal work authorization user identification number and date of authorization are as follows:

E-Verify Company ID Number

Date of Authorization

Name of Sub-Contractor

Name of Project

Name of Public Employer

I hereby declare under penalty of perjury that the foregoing is true and correct.

Executed on _____, 20__ in _____ (city), _____ (state).

Signature of Authorized Officer or Agent

Subscribed and Sworn before me on this the _____ Day of _____, 20__

Notary Public

My Commission Expires: _____

END OF SECTION 00484

SECTION 00500
CONTRACT AGREEMENT

This Contract Agreement made and entered into on the ____ day of _____, 20____, by and between the City of Warner Robins, party of the first part (hereinafter called the Owner), and _____, party of the second part (hereinafter called the Contractor).

WITNESSETH:

That the Contractor, for the consideration hereinafter fully set out, hereby agrees with the Owner as follows:

That the Contractor will furnish all products, tools, construction equipment, skill and labor of every description necessary to carry out and to complete in a good, firm, substantial workmanlike manner the **City Of Warner Robins's Gas Easement Remediation** project, and will complete work in strict conformity with the Drawings and the Specifications, together with the foregoing Bid made by the Contractor, the Invitation to Bid, Instructions to Bidders, General and Supplementary Conditions, Performance and Payment Bonds and all Addenda hereto incorporated (if applicable) which form essential parts of this Contract Agreement, as if fully contained herein.

That the Contractor shall commence the Work to be performed under this Contract Agreement on a date to be specified in a written Notice to Proceed and shall fully complete all work hereunder within **90 consecutive calendar days**. Time is of the essence and is an essential element of this Contract, and the Contractor shall pay to the Owner, not as a penalty, but as liquidated damages, the sum of **\$500 for each calendar day** that there is default of completing the Work within the time limit named herein. If the Contractor abandons the Contract before commencement of the Work or defaults in completion of all the Work after commencement thereof, the Contractor shall be liable for such liquidated damages. These fixed liquidated damages are not established as a penalty but are calculated and agreed upon in advance by the Owner and the Contractor due to the uncertainty and impossibility of making a determination as to the actual and consequential damages incurred by the Owner and the general public of Warner Robins, Georgia as a result of the failure on the part of the Contractor to complete the Work on time. Such liquidated damages referred to herein are intended to be and are cumulative and shall be in addition to every other remedy now or hereafter enforceable at law, in equity, by statute, or under the Contract.

The Owner hereby agrees to pay to the Contractor for the faithful performance of this Contract Agreement, subject to additions and deductions as provided in the Specifications and Bid, in lawful money of the United States _____ of _____ America, _____ the _____ sum _____ of _____ (\$ _____) which sum shall also pay for loss or damage arising out of the nature of the Work aforesaid, or from the action of the elements, or from unforeseen obstructions or difficulties encountered in the prosecution of the Work, and for all expenses incurred by, or in consequence of the Work, its suspension or discontinuance and for well and faithfully completing the Work and the whole thereof, as herein provided, and for replacing defective work or products for a period of one (1) year after completion.

The Owner shall make monthly partial payments to the Contractor in accordance with the provisions of the Contract Documents. Retainage will be held at five (5) percent of the Work completed and stored materials of the contracted work. Retainage shall be held until the Work is complete and the Contractor has fulfilled all

requirements of the Contract Agreement.

Final payment on account of this Contract Agreement shall be made within thirty (30) days after the completion by the Contractor of all work covered by this Contract Agreement and the acceptance of such work by the Owner, in accordance with the provisions of the Contract Documents.

It is further mutually agreed between the parties hereto that if, at any time after the execution of this Contract Agreement and the surety bonds hereto attached for its faithful performance, the Owner shall deem the surety or sureties upon such bond to be unsatisfactory, or if, for any reason, such bond ceases to be adequate to cover the performance of the Work, the Contractor shall, at no additional expense to Owner, within five (5) days after the receipt of notice from the Owner to do so, furnish an additional bond or bonds in such form and amount, and with such surety or sureties as shall be satisfactory to the Owner. In such event, no further payment to the Contractor shall be deemed to be due under this Contract Agreement until such new or additional security for the faithful performance of the Work shall be furnished in manner and form satisfactory to the Owner.

IN WITNESS WHEREOF, the parties hereto have executed this Contract Agreement under their respective seals on the day and date first above written in four counterparts each of which shall, without proof or accounting for the other counterparts, be deemed an original Contract.

APPROVED AS TO FORM BEFORE EXECUTION

By: _____
Attorney for the Owner

OWNER: City of Warner Robins

By: _____

Name: _____
(Please Print)

Title: _____

WITNESS: _____

Name: _____
(Please Print)

(SEAL)

Title: _____

CONTRACTOR: _____

By: _____

Name: _____
(Please Print)

Title: _____

ATTEST: _____

Name: _____
(Please Print)

(SEAL)

Title: _____

Note: If the Contractor is a corporation, the Contract Agreement shall be signed by the president or vice president, attested by the secretary and the corporate seal affixed. If the Contractor is a partnership, the Contract Agreement shall be signed in the partnership name by one of the partners, with indication that he or she is a general partner.

END OF SECTION 00500

SECTION 00550
PRE-AWARD OATH

We have not directly or indirectly violated law and we have not:

- Prevented or attempted to prevent competition in such bidding or proposals by any means whatever,
- Prevented or endeavored to prevent anyone from making a bid or proposal thereof by any means whatever, nor
- Caused or induced another to withdraw a bid or proposal for the work.

We affirm that no other officers, agents or other persons acted for the Contractor in the bidding for and procurement of this Contract.

Signature	Printed Name	Title	Date
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Subscribed and Sworn before me on _____ Day of _____, 20____

Notary Public

My Commission Expires: _____, 20____

END OF SECTION 00550

SECTION 00610
PERFORMANCE BOND

STATE OF GEORGIA

BOND NO. _____

COUNTY OF HOUSTON

KNOW ALL MEN BY THESE PRESENTS, that we, _____, as Principal, (hereinafter known as Contractor), and we, _____, as Surety, do hereby acknowledge ourselves indebted and firmly bound and held unto the City of Warner Robins for use and benefit of those entitled thereto, in the sum of _____ Dollars (\$ _____) for the payment of which will and truly to be made, in lawful money of the United States of America, 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 (\$ _____) for the City Of Warner Robins's "**GAS EASEMENT REMEDIATION**" project as more fully appears in a written Contract Agreement bearing the date of _____, 20____, a copy of which Contract 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 Contract Agreement 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 Owner any and all outlay and expense which it may incur in making good any such default, and shall correct all defects in products and workmanship appearing within one (1) year of the completion of all Work, then this obligation 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 Contract Agreement, or in the Work to be performed thereunder, or the Specifications accompanying the same shall in any way affect the obligations under this Contract Agreement or Bond, and notice is hereby waived of any such damage, extension of time, alteration or addition to the terms of the Contract Agreement or to the Work or to the Contract Documents.

This bond is given pursuant to and in accordance with the provisions of O.C.G.A. Section 36-91-1 *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 seal, 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 four (4) counterparts.

CONTRACTOR - PRINCIPAL: _____

By: _____

Name: _____

(Please Print)

Title: _____

ATTEST:

Name: _____

(Please Print)

(SEAL)

Title: _____

Note: Attestation for a corporation must be by the corporate secretary; for a partnership by another partner; for an individual by a notary.

SURETY: _____

By: _____

Name: _____

(Please Print)

Title: _____

ATTEST: _____

Name: _____

(Please Print)

(SEAL)

Title: _____

Note: Surety companies executing Bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state of Georgia.

END OF SECTION 00610

SECTION 00620
PAYMENT BOND

STATE OF GEORGIA

BOND NO. _____

COUNTY OF HOUSTON

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

WHEREAS, said Contractor has entered into a certain Contract Agreement with said Owner, dated _____, 20__ for the CITY OF WARNER ROBINS's "GAS EASEMENT REMEDIATION" project, (hereinafter called the Contract), which Contract Agreement and the Contract Documents for said Work shall be deemed a part hereof as fully as if set out herein.

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 Agreement is sublet and all assignees of said Contractor and of such subcontractors shall promptly make payments to all persons supplying them with labor, products, services, or supplies for or in the prosecution of the Work provided for in such Contract Agreement, or in any amendment or extension of or addition to said Contract Agreement, and for the payment of reasonable attorney's fees, incurred by the claimant 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 Agreement 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 Agreement 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 its use and benefit against said Contractor and Surety or either party (but not later than one year after the final settlement of said Contract Agreement) in which action such claim or claims shall be adjudicated and judgment rendered thereon.
- (b) The Principal and Surety hereby designate and appoint _____, as the agent of each party 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 (1) year after the final settlement of said Contract Agreement.

- (d) This Bond is given pursuant to and in accordance with provisions of O.C.G.A. Section 36-91-1 *et seq.* hereinafter, 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 seal, 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 four (4) counterparts.

CONTRACTOR - PRINCIPAL: _____

By: _____

Name: _____
(Please Print)

Title: _____

ATTEST: _____

Name: _____
(Please Print)

(SEAL)

Title: _____

Note: Attestation for a corporation must be by the corporate secretary; for a partnership by another partner; for an individual by a notary.

SURETY: _____

By: _____

Name: _____
(Please Print)

Title: _____

WITNESS: _____

Name: _____
(Please Print)

(SEAL)

Title: _____

Note: Surety companies executing Bonds must appear on the Treasury 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 00620

SECTION 00621
NOTICE OF AWARD

Date:

Project: **Gas Easement Remediation**

Bidder:

Bidder's Address:

This document serves as notification that your Bid dated _____ for the Contract identified above has been considered. You are the Successful Bidder and are awarded a Contract for \$_____.

Included with this Notice of Award are:

Four (4) copies of the proposed Contract Documents, excluding Drawings which will be delivered separately.

The following conditions must be completed within fifteen (15) days of the date you receive this Notice of Award:

1. Deliver four (4) fully executed counterparts of the Contract Documents to the Owner.
2. Deliver the Contract Performance and Payment Bonds as specified in the Instructions to Bidders (Section 00200) and General Conditions (Paragraph 5.01) with the executed Contract Documents.
3. Deliver the Contract Certificate of Insurance as specified in the General Conditions (Paragraph 5.03) and Supplementary Conditions (Part 8) with the executed Contract Documents.

Failure to fulfill these requirements within the identified time will entitle Owner to consider you in default, annul this Notice of Award and declare your Bid security forfeited.

Owner will return to you one (1) fully executed counterpart of the Contract Documents within ten (10) days after your compliance with the above conditions.

City of Warner Robins

Authorized Signature

Title

Acceptance of Notice

Receipt of the above Notice of Award is hereby acknowledged by:

_____ this ____ day of _____, 20____.
Contractor

By: _____

Title: _____

END OF SECTION 00621

SECTION 00622
NOTICE TO PROCEED

Date: _____

Project: **Gas Easement Remediation**

Bidder:

Bidder's Address:

This document serves to notify you that the Contract Times under the above Contract will commence to run on _____. You are to begin performing your requirements under the Contract Documents on or before that date. In accordance with the Contract Agreement, the date of Substantial Completion and readiness for final payment is _____.

Preceding the start of any Work at the Site, Paragraph 2.01.B of the General Conditions requires that you and Owner must each deliver to the other certificates of insurance which each is obligated to purchase and maintain in accordance with the Contract Documents.

City Of Warner Robins

Owner

Authorized Signature

Title

Date

Accepted By:

Contractor

Authorized Signature

Title

Date

END OF SECTION 00622

SECTION 00700 - GENERAL CONDITIONS

TABLE OF CONTENTS

	<u>Page No.</u>
<u>Article 1 – Definitions and Terminology</u>	
1.01 Defined Terms	5
1.02 Terminology	9
<u>Article 2 – Preliminary Matters</u>	
2.01 Delivery of Bonds and Evidence of Insurance	11
2.02 Copies of Documents	11
2.03 Commencement of Contract Times; Notice to Proceed	11
2.04 Starting the Work	11
2.05 Before Starting Construction	11
2.06 Preconstruction Conference; Designation of Authorized Representatives	11
2.07 Initial Acceptance of Schedules	12
<u>Article 3 – Contract Documents: Intent, Amending, Reuse</u>	
3.01 Intent	12
3.02 Reference Standards	12
3.03 Reporting and Resolving Discrepancies	13
3.04 Amending and Supplementing Contract Documents	13
3.05 Reuse of Documents	14
3.06 Electronic Data	14
<u>Article 4 – Availability of Lands; Subsurface and Physical Conditions; Hazardous Environmental Conditions; Reference Points</u>	
4.01 Availability of Lands	15
4.02 Subsurface and Physical Conditions	15
4.03 Differing Subsurface or Physical Conditions	15
4.04 Underground Facilities	17
4.05 Reference Points	17
4.06 Hazardous Environmental Condition at Site	18
<u>Article 5 – Bonds and Insurance</u>	
5.01 Performance, Payment, and Other Bonds	19
5.02 Licensed Sureties and Insurers	19
5.03 Certificates of Insurance	20
5.04 Contractor’s Insurance	20
5.05 Owner’s Liability Insurance	21
5.06 Property Insurance	21
5.07 Waiver of Rights	22
5.08 Receipt and Application of Insurance Proceeds	23
5.09 Acceptance of Bonds and Insurance; Option to Replace	23
5.10 Partial Utilization, Acknowledgment of Property Insurer	24

Article 6 – Contractor’s Responsibilities

6.01	Supervision and Superintendence	24
6.02	Labor; Working Hours	24
6.03	Services, Materials, and Equipment	25
6.04	Progress Schedule	25
6.05	Substitutes and “Or-Equals”	25
6.06	Concerning Subcontractors, Suppliers, and Others	28
6.07	Patent Fees and Royalties	29
6.08	Permits	29
6.09	Laws and Regulations	29
6.10	Taxes	30
6.11	Use of Site and Other Areas	30
6.12	Record Documents	30
6.13	Safety and Protection	30
6.14	Safety Representative	31
6.15	Hazard Communication Programs	32
6.16	Emergencies	32
6.17	Shop Drawings and Samples	32
6.18	Continuing the Work	34
6.19	Contractor’s General Warranty and Guarantee	34
6.20	Indemnification	34
6.21	Delegation of Professional Design Services	35

Article 7 – Other Work at the Site

7.01	Related Work at Site	36
7.02	Coordination	36
7.03	Legal Relationships	37

Article 8 – Owner’s Responsibilities

8.01	Communications to Contractor	37
8.02	Furnish Data	37
8.03	Pay When Due	37
8.04	Lands and Easements; Reports and Tests	37
8.05	Insurance	37
8.06	Change Orders	38
8.07	Inspections, Tests, and Approvals	38
8.08	Limitations on Owner’s Responsibilities	38
8.09	Undisclosed Hazardous Environmental Condition	38
8.10	Evidence of Financial Arrangements	38
8.11	Compliance with Safety Program	38

Article 9 – Engineer’s Status During Construction

9.01	Owner’s Representative	38
9.02	Visits to Site	38
9.03	Project Representative	39
9.04	Authorized Variations in Work	39
9.05	Rejecting Defective Work	39
9.06	Shop Drawings, Change Orders and Payments	39
9.07	Determinations for Unit Price Work	40
9.08	Decisions on Requirements of Contract Documents and Acceptability of Work	40
9.09	Limitations on Engineer’s Authority and Responsibilities	40

Article 10 – Changes in the Work; Claims

10.01	Authorized Changes in the Work	41
10.02	Unauthorized Changes in the Work	41
10.03	Execution of Change Orders	41
10.04	Notification to Surety	41
10.05	Claims	42

Article 11 – Cost of the Work; Allowances; Unit Price Work

11.01	Cost of the Work	42
11.02	Allowances	45
11.03	Unit Price Work	45

Article 12 – Change of Contract Price; Change of Contract Times

12.01	Change of Contract Price	46
12.02	Change of Contract Time	47
12.03	Delays	47

Article 13 – Tests and Inspections; Correction, Removal, or Acceptance of Defective Work

13.01	Notice of Defects	48
13.02	Access to Work	48
13.03	Tests and Inspections	48
13.04	Uncovering Work	49
13.05	Owner May Stop the Work	49
13.06	Correction or Removal of Defective Work	50
13.07	Correction Period	50
13.08	Acceptance of Defective Work	51
13.09	Owner May Correct Defective Work	51

Article 14 – Payments to Contractor and Completion

14.01	Schedule of Values	52
14.02	Progress Payments	52
14.03	Contractor’s Warranty of Title	54
14.04	Substantial Completion	54
14.05	Partial Utilization	55

14.06 Final Inspection	55
14.07 Final Payment	55
14.08 Final Completion Delayed	56
14.09 Waiver of Claims	57

Article 15 – Suspension of Work and Termination

15.01 Owner May Suspend Work	57
15.02 Owner May Terminate for Cause	57
15.03 Owner May Terminate for Convenience	58
15.04 Contractor May Stop Work or Terminate	59

Article 16 – Dispute Resolution

16.01 Methods and Procedures	59
------------------------------	----

Article 17 – Miscellaneous

17.01 Giving Notice	60
17.02 Computation of Times	60
17.03 Cumulative Remedies	60
17.04 Survival of Obligations	60
17.05 Controlling Law	60
17.06 Heading	61

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

- A. The following terms shall have the specified meanings wherever they are used with initial capital letters in the Bidding Requirements or Contract Documents. Terms with initial capital letters in the Contract Documents will also include references to identified articles and paragraphs and the titles of other documents or forms.
1. *Addenda*: Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
 2. *Agency*: The Federal or State agency named as such in the Agreement.
 3. *Agreement*: The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.
 4. *Application for Payment*: The form acceptable to Engineer which is to be used by the Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
 5. *Asbestos*: Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.
 6. *Balanced Bid*: A Bid in which each of the unit prices and total amount bid for each of the listed items reasonably reflects the value of that item with regard to the entire job considering the prevailing cost of labor, material and equipment in the relevant market. A Bid is unbalanced when, in the opinion of the Owner, any unit prices or total amounts bid on any of the listed items do not reasonably reflect such values.
 7. *Bid*: The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 8. *Bidder*: The individual or entity who submits a Bid directly to Owner.
 9. *Bidding Documents*: The Bidding Requirements and the proposed Contract Documents (including all Addenda).
 10. *Bidding Requirements*: The advertisement or invitation to bid, Instructions to Bidders, Bid security of acceptable form, if any, and the Bid Form with any supplements.
 11. *Change Order*: A document recommended by Engineer which is signed by Contractor and Owner and authorized an addition, deletion, or revision in the Work or an adjustment

in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.

12. *Claim:* A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.
13. *Contract:* The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.
14. *Contract Documents:* Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.
15. *Contract Price:* The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).
16. *Contract Times:* The number of consecutive calendar days as provided in the Contract Agreement for completion of the Project, to be computed from the date of the Notice to Proceed.
17. *Contractor:* The party of the second part to the Contract Agreement or the authorized and legal representative of such party.
18. *Cost of the Work:* Defined in Paragraph 11.01.
19. *Drawings:* That part of the Contract Documents prepared or approved by Owner which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.
20. *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.
21. *Engineer:* The City of Warner Robins' staff engineer(s) or consultant engineers.
22. *Field Order:* A written order issued by engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.
23. *General Requirements:* Sections of Division 1 of the Specifications.

24. *Hazardous Environmental Condition:* The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto.
25. *Hazardous Waste:* The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.
26. *Laws and Regulations; Laws or Regulations:* Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
27. *Liens:* Charges, security interests, or encumbrances upon Project funds, real property, or personal property.
28. *Liquidated Damages:* The sum of **\$500 per day** which the Bidder agrees to pay for each consecutive day, beyond the Contract Time, required to complete the Project. Liquidated Damages will end upon written notification from the Owner of final acceptance of the Project.
29. *Milestone:* A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.
30. *Notice of Award:* The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.
31. *Notice to Proceed:* A written notice given by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.
32. *Owner:* The City of Warner Robins, party of the first part to the Contract Agreement, or its authorized and legal representatives.
33. *PCBs:* Polychlorinated biphenyls.
34. *Petroleum:* Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.
35. *Products:* Materials or equipment permanently incorporated into the Project.
36. *Progress Schedule:* A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.

37. *Project*: The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.
38. *Project Manual*: The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.
39. *Provide*: To furnish and install.
40. *Radioactive Material*: Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.
41. *Related Entity*: An officer, director, partner, employee, agent, consultant, or subcontractor.
42. *Resident Project Representative*: The authorized representative of Engineer who may be assigned to the Site or any part thereof.
43. *Samples*: Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.
44. *Schedule of Submittals*: A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.
45. *Schedule of Values*: A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.
46. *Shop Drawings*: All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.
47. *Site*: Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.
48. *Specifications*: That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto.
49. *Subcontractor*: An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.

50. *Substantial Completion:* The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) is ready for final inspection and can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion.
51. *Successful Bidder:* The Bidder submitting a responsive Bid to whom Owner makes an award.
52. *Supplementary Conditions:* That part of the Contract Documents which amends or supplements the General Conditions.
53. *Supplier:* A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or Subcontractor.
54. *Underground Facilities:* All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
55. *Unit Price Work:* Work to be paid for on the basis of unit prices.
56. *Work:* The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.
57. *Work Change Directive:* A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive 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 Times.

1.02 Terminology

A. Intent of Certain Terms or Adjectives:

1. The terms “as allowed,” “as approved,” “as ordered,” “as directed,” or other terms of like effect included in the Contract Documents are to authorize an implementation of professional judgment by the Engineer. The adjectives “reasonable”, “suitable”, “acceptable”, “proper”, “satisfactory” or other adjectives of comparable effect are utilized to describe an action or determination of Engineer in relation to the Work. The intention of Engineer’s exercise of professional judgment, action or determination will be exclusively for the evaluation of the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a whole as specified in the Contract Documents. The use of any such term is not intended to be effective to appoint Engineer any duty or authority to supervise or direct the execution of the Work or to assume any responsibility contrary to the provisions of Paragraph 9.09 or any other provision within the Contract Documents.

B. *Day:*

1. The word “day” means a 24 hour period measured from midnight to the following midnight.

C. *Defective:*

1. The word “defective”, when describing the word “Work”, refers to Work that is either unsatisfactory, faulty, or deficient in that it:
 - a. does not conform to the Contract Documents; or
 - b. does not meet the requirements of any applicable inspection, reference standard, test or approval referred to in the Contract Documents; or
 - c. Has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 14.04 or 14.05).

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

1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
2. The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

4. When “furnish,” “install,” “perform,” or “provide” is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, “provide” is implied.
- F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

2.01 Delivery of Bonds and Evidence of Insurance

- A. Contractor shall deliver required bonds to Owner when Contractor delivers the executed counterparts of the Agreement to Owner.
- B. *Evidence of Insurance:* Prior to starting any Work at Site, Contractor and Owner shall provide to the other certificates of insurance (along with any other proof of insurance that either of them may request), as noted in the Supplementary Conditions, which Contractor and Owner, in accordance with Article 5, are required to purchase and maintain.

2.02 Copies of Documents

- A. Owner shall provide Contractor up to six (6) printed or hard copies of the Drawings and Project Manual with additional copies being available at the cost of reproduction.

2.03 Commencement of Contract Times; Notice to Proceed

- A. Contract Times will start on the day identified in the Notice to Proceed. A Notice to Proceed may be given at any time thirty days after the Effective Date of the Agreement. The start of the Contract Times will never run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement.

2.04 Starting the Work

- A. No work will be allowed prior to the date on which the Contract Times start. Contractor shall begin Work at the site on the date that the Contract Times start.

2.05 Before Starting Construction

- A. *Preliminary Schedules:* Contractor shall submit to Engineer, for review, within ten days after the Effective Date of the Agreement preliminary:
 1. Progress Schedule that indicates the times (dates or numbers of days) for beginning and finishing various phases of Work. This preliminary Progress Schedule shall also include Milestones specified in the Contract Documents;
 2. Schedule of Submittals; and

3. Schedule of Values for the entire Work that includes quantities and prices of items which when summed together are equal to the Contract Price and subdivides the Work to allow for progress payments during the Work. Submitted prices will include an appropriate amount of overhead and profit applicable to each item.

2.06 Preconstruction Conference; Designation of Authorized Representatives

- A. Prior to beginning any Work at the Site, a conference attended by Owner, Contractor, Engineer and others as applicable will be held to provide a working understanding between the parties of the Work and to discuss the preliminary Schedules in Paragraph 2.05.A, process for Shop Drawings and other submittals, Applications for Payment and maintaining required records.
- B. Owner and Contractor shall each designate an individual(s) to act as authorized representative in regards to the services and responsibilities under the Contract at this conference. The individuals shall possess the ability to transmit instructions, receive information, provide decisions related to the Contract and act on behalf of each party.

2.07 Initial Acceptance of Schedules

- A. At least ten days prior to submission of the initial Application for Payment a meeting shall be held and attended by Engineer, Contractor and others to review for acceptability to Engineer, as provided below and in Section 013216, the schedules referenced in Paragraph 2.05.A. If necessary, Contractor will make corrections to the schedules and resubmit within ten days. Owner will not provide any progress payment until Contractor submits satisfactory schedules.
 1. Engineer will accept the Progress Schedule if an orderly progression of Work is provided to be completed within the Contract Times. Such acceptance will not relieve Contractor of their full responsibility nor make Engineer liable for Progress Schedule, progress of Work, sequencing or scheduling.
 2. Engineer will accept Contractor's Schedule of Submittals if a practical arrangement for review and processing of the required submittals is provided.
 3. Engineer will accept Contractor's Schedule of Values if, in form and substance, it provides a reasonable allocation of the Contract Price for the component parts of the Work.

ARTICLE 3 – CONTRACT DOCUMENT: INTENT, AMENDING, REUSE

3.01 Intent

- A. The Contract Documents are complementary; what is required by one is as binding as if required by all.
- B. The Contract Documents are intended to describe a functionally complete project to be constructed in accordance with the Contract Documents. Any labor, documentation, services,

materials, or equipment that is mandatory to produce the intended results will be provided at no additional cost to Owner.

- C. Engineer will issue clarifications and interpretations of the Contract Documents.

3.02 *Reference Standards*

A. Standards, Specifications, Codes, Laws, and Regulations

1. Reference to standards, specifications, manuals, codes of any technical society, organization, association or Laws or Regulations, shall mean the standard, specification, manual, code, or Laws or Regulations that are in effect at the time of opening of Bids unless stated differently in the Contract Documents.
2. No provisions of any standard, specification, manual, code or instruction of a Supplier shall change the obligations of Owner, Contractor, subcontractor, consultants, agents or employees from those described in the Contract Documents. No provision or instruction shall assign any duty or authority to supervise or direct performance of the Work or undertake any responsibility inconsistent with Contract Documents to Owner, or their officers, directors, members, partners, employees, agents, consultants or subcontractors.

3.03 *Reporting and Resolving Discrepancies*

A. Reporting Discrepancies:

1. *Contractor's Review of Contract Documents Before Starting Work:* Contractor is responsible to study and compare Contract Documents and confirm relevant figures and field measurements before beginning each part of the Work. Contractor is responsible for providing Engineer with written reports of any conflict, error or discrepancy which Contractor discovers. Engineer will provide Contractor with a written interpretation after which Contractor may proceed with any affected Work.
2. *Contractor's Review of Contract Documents During Performance of Work:* If any conflict, error or discrepancy within the Contract Documents, or between Contractor Documents and (i) any applicable Law or Regulation, (ii) any standard, specification, manual, or code, or (iii) any instruction by any Supplier, occurs during the performance of the Work, the Contractor is responsible for providing Engineer with written reports of the conflict. Contractor will not proceed with any affected Work until a revision or supplement of the Contract Documents is issued.
3. Unless Contractor had actual knowledge of any conflict, error or discrepancy in the Contract Documents, neither Owner nor Engineer will hold Contractor liable for failure to report.

B. *Resolving Discrepancies:*

1. Unless stated in the Contract Documents, the provisions of the Contract Documents

take precedence in the resolution of any conflict, error or discrepancy between the provisions of the Contract Documents and:

- a. the provisions of any standard, specification, manual, code, or the instruction of any Supplier; or
- b. the provisions of any Laws or Regulations applicable to the performance of the Work, unless violation of such Law or Regulation would result from the interpretation of the Contract Documents.

3.04 *Amending and Supplementing Contract Documents*

- A. Amendments to the Contract Documents may be made to accommodate additions, deletions and revisions in the Work or to modify the terms and conditions by either a Change Order or Work Change Directive.
- B. The requirements of the Contract Documents may be supplemented and minor changes in the Work may be approved by one of the following:
 1. Field Order;
 2. Engineer's approval of a Shop Drawing; or
 3. Engineer's written interpretation.

3.05 *Reuse of Documents*

- A. Neither Contractor, nor any Subcontractor or Supplier may:
 1. acquire any title to or ownership rights of any Drawings, Specifications or other documents prepared by or bearing the seal of Engineer or its consultants; or
 2. Reuse Drawings, Specifications, other documents or copies of the Project without Owner's and Engineer's specific written consent.
- B. The prohibitions in Paragraph 3.05 will last beyond final payment or termination of the Contract. These prohibitions will not prevent Contractor from possessing copies of the Contract Documents for record purposes.

3.06 *Electronic Data*

- A. The data furnished by Owner/Engineer to Contractor or Contractor to Owner/Engineer that may be relied upon is limited to printed copies, unless otherwise noted in the Supplementary Conditions. Electronic files are provided for the convenience of the recipient and any conclusion resulting from electronic files will be the sole risk of the user. Hard copies govern any difference between electronic fills and hard copies.

- B. Due to the deterioration and inadvertent modification of electronic media, it is the responsibility of the receiving party to perform acceptance test within sixty days, after which the receiving party will be deemed to have accepted the data. The transferring party will correct any errors detected within the sixty days.
- C. The transferring party is not responsible for compatibility, usability or readability of documents due to differing software applications, operating systems or computer hardware of the recipient.

ARTICLE 4 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

4.01 Availability of Lands

- A. The Site of the Project shall be furnished by Owner. Owner shall inform Contractor of any restrictions or encumbrances that are specific to the Site that Contractor must comply with during performance of the Work. It is the responsibility of the Owner to obtain and pay for, in a timely manner, any easements needed for permanent structures or permanent changes to existing facilities. If Owner and Contractor are unable to agree on entitlement to or on the amount of any adjustment in the Contract Price or Contract Times that results due to delay caused by Owner's furnishing of the Site the Contractor may make a claim as provided by Paragraph 10.05.
- B. Contractor may request a current statement of record legal title and legal description of the lands upon which the Work will be performed as necessary to file a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor is responsible for providing all additional lands and access to lands that may be required for temporary construction facilities or for the storage of equipment and materials.

4.02 Subsurface and Physical Conditions

- A. *Reports and Drawings:* The Supplementary Conditions identify:
 - 1. reports of explorations and tests of subsurface conditions at or contiguous to the Site that are known by the Owner.
 - 2. drawings of physical conditions relating to existing surface or subsurface structures at or contiguous to the Site that are known by the Owner (except Underground Facilities).
- B. *Limited Reliance by Contractor on Technical Data Authorized:* "Technical data" contained in such reports and drawings are not Contract Documents but the Contractor may rely on them regardless. The Supplementary Conditions identify such "technical data". Except for reliance on "technical data", Contractor may not rely upon or make claim against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants or subcontractors with respect to:
 - 1. the extensiveness of such reports and drawings for Contractor's purposes, including, but

not limited to, means, methods, techniques, sequences and procedures of construction employed by Contractor; or

2. any other information, data or interpretations of such reports or drawings; or
3. any interpretation made by the Contractor of any “technical data” or any other data, interpretations or information.

4.03 *Differing Subsurface or Physical Conditions*

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

1. differs in nature from any “technical data” Contractor is entitled to rely on as provided in Paragraph 4.02; or
2. is of such a nature to mandate a change of the Contract Documents; or
3. differs from what is shown in the Contract Documents; or
4. is unusual in nature and is materially different from ordinary conditions that are recognized as inherent to the work as provided by the Contract Documents; it is the responsibility of the Contractor to inform the Owner and Engineer in writing promptly after becoming aware of the condition and to halt any other disturbance of the subsurface or physical conditions (except in the case of an emergency as required in Paragraph 6.16.A). No further Work shall be performed at the site until Contractor receives a written order to do so.

B. *Engineer’s Review:* Engineer will promptly review the relevant condition after receipt of written notice as required by Paragraph 4.03.A and determine if there is a need for additional testing in the area. Engineer will inform Contractor in writing of the findings and conclusions.

C. *Possible Price and Times Adjustments:*

1. The Contract Price or Contract Times will be increased or decreased based on the findings of such differing subsurface or physical condition subject to the following:
 - a. such condition must meet at least one of the categories described in Paragraph 4.03.A; and
 - b. any adjustment in Contract Price for Work that is unit price based will be subject to the provisions of Paragraphs 9.07 and 11.03.
2. No adjustment in the Contract Price or Contract Times will be made if:
 - a. Contractor had knowledge of such conditions at the time Contractor submitted a Bid.

- b. discovery of such condition could have been reasonably revealed through any examination, investigation, exploration, test or study of the Site as required by the Bidding Requirements or Contract Documents that should be conducted by Contractor before making final commitment to Owner; or
 - c. written notice, as required by Paragraph 4.03.A, was not executed by Contractor.
- 3. If an agreement is not able to be made between Owner and Contractor for an adjustment in the Contract Price or Contract Time, a Claim may be made as provided in Paragraph 10.05. Contractor shall not hold Owner or Engineer liable for any claims, costs, losses or damages sustained by Contractor in connection with any other project or anticipated project.

4.04 *Underground Facilities*

- A. *Shown or Indicated:* The Underground Facilities at or contiguous to the Site that are shown in the Contract Documents is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities. Unless otherwise provided in the Supplementary Conditions:
 - 1. Owner and Engineer are not responsible for accuracy of any information or data provided by others; and
 - 2. Contractor has full responsibility of the following and the cost of all will be included in the Contract Price:
 - a. reviewing and verifying all provided information and data;
 - b. locating all Underground Facilities shown in the Contract Documents;
 - c. coordinating Work with owners of all Underground Facilities at the Site during construction; and
 - d. safety and protection of all Underground Facilities and fixing any damage that is the result of the Work.
- B. *Not Shown or Indicated:*
 - 1. Contractor must contact owner of any Underground Facility that is uncovered at or contiguous to the Site which was not shown or not shown with reasonable accuracy in the Contract Documents. The Contractor must also provide Owner and Engineer with written notice. Engineer will promptly review the Underground Facility and determine if a change in the Contract Documents is required due to the existence of such Underground Facility. It will be the responsibility of the Contractor to protect such Underground Facility.
 - 2. If a change in the Contract Documents is deemed necessary by the Engineer, a Work

Change Directive or a Change Order will be issued to document such consequences. As necessary, an adjustment shall be made in the Contract Price or Contract Time due to the hindrance caused by such Underground Facility. If an agreement on the adjustment of the Contract Price or Contract Time between Owner and Contractor is not reached, a Claim may be made, as provided by Paragraph 10.05.

4.05 *Reference Points*

- A. Reference points necessary for the Contractor will be provided by Owner through engineering surveys. It is the responsibility of the Contractor to lay out the Work and protect and preserve established reference points. The Contractor shall not relocate or make changes to established reference points without written approval from Owner. Contractor shall inform Engineer of any reference points that are lost, destroyed or require relocation. Contractor will bear responsibility for accurate replacement or relocation of said reference points by professionally qualified personnel.

4.06 *Hazardous Environmental Condition at Site*

- A. *Reports and Drawings:* Any Hazardous Environmental Conditions at the Site that are known by the Owner will be identified by reports and drawings in the Supplementary Conditions.
- B. *Limited Reliance by Contractor on Technical Data Authorized:* “Technical data” will be identified in the Supplementary Conditions. Contractor may rely on the “technical data” in such reports and drawing but reports and drawings are not Contract Documents. Except for reliance upon “technical data”, Contractor may not make any claim against Owner or Engineer with respect to:
 - 1. The comprehensiveness of “technical data” for use by the Contractor for any aspects of but not limited to safety precautions, techniques, means, methods and procedures of construction used by Contractor; or
 - 2. data, interpretations, opinions and information contained in the “technical data”; or
 - 3. any interpretation or conclusion developed from the “technical data” by Contractor or any other data, interpretation, opinion or information.
- C. Any Hazardous Environmental Condition uncovered by Contractor at the Site that was not shown in the Drawings, Specifications or identified in the Contract Documents will not be the responsibility of the Contractor. Any Hazardous Environmental Condition created by materials brought to the Site by anyone the Contractor is responsible for, shall be the responsibility of the Contractor.
- D. If a Hazardous Environmental Condition is encountered or created by Contractor or anyone Contractor is responsible for, Contractor must immediately: (i) isolate or secure said condition; (ii) stop all Work in any area affected by or in connection with said condition, except in an emergency as required by Paragraph 6.16.A; and (iii) notify Owner and Engineer and later confirm notification in writing. Engineer will promptly determine if a qualified expert is needed

to evaluate said condition. Owner will promptly take action to obtain required permits and will provide Contractor with a written notice as required in Paragraph 4.06.E.

- E. Contractor will not be required to resume Work in affected area until Owner has obtained required permits and delivered written notice to Contractor specifying: (i) the affected site has been rendered safe for Work to resume; or (ii) any precautions needed to safely resume Work. If an agreement between Owner and Contractor is not met concerning Contract Price or Contract Items as a result of Work stoppage or any special conditions required to resume Work, a Claim may be made as provided in Paragraph 10.05.
- F. If Contractor does not reasonably believe that it is safe to resume Work or does not agree to resume Work under special conditions required after written notice from Owner, the Owner may order affected area to be deleted from the Work. If an agreement between Owner and Contractor is not met concerning Contract Price or Contract Items as a result of deleting said portion of the Work, a Claim may be made as provided in Paragraph 10.05. Owner may use Owner's forces or others, in accordance with Article 7, to perform the deleted portion of the Work.
- G. To the extent permitted by Georgia law, Owner shall indemnify and hold harmless Contractor and anyone under the responsibility of the Contractor against all claims, costs, damages and losses due to the Hazardous Environmental Condition, provided that the Hazardous Environmental Condition: (i) was not indicated in any Contract Documents, Drawings or Specifications within the scope of the Work; and (ii) was not caused by Contractor or anyone under the responsibility of the Contractor. Nothing in this Paragraph obligates Owner to indemnify any individual or entity from consequences caused by that individual or entity's own negligence.
- H. Contractor shall indemnify and hold harmless Owner and engineers, officers, directors, members, partners, employees, agents, consultants, and subcontractors of the Owner against all claims, costs, damages and losses due to any Hazardous Environmental Condition created by Contractor or anyone under the responsibility of the Contractor. Nothing in this Paragraph obligates Contractor to indemnify any individual or entity from consequences caused by that individual or entity's own negligence.
- I. Any Hazardous Environmental Condition uncovered or revealed at the Site does not fall under the provisions of Paragraph 4.02, 4.03 and 4.04.

ARTICLE 5 – BONDS AND INSURANCE

5.01 Performance, Payment and Other Bonds

- A. Performance and payment bonds shall be furnished by Contractor. Each bond shall be in an amount at least equal to the Contract Price. The bonds must remain in effect until the end of the correction period, as specified in Paragraph 13.07, or one year after the date that the final payment is due, whichever is later, unless there is a conflict with Laws or Regulations or the Contract Documents. Any other bonds required by the Contract Documents must be furnished by the Contractor.

- B. All bonds shall be executed by sureties named in the list of “Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies” as published in Circular 570 by the U.S. Department of the Treasury. Said bonds shall be in the form required by the Contract Documents unless it conflicts with any Laws or Regulations. All bonds must be signed by an agent or attorney-in-fact and in order to bind the surety must have a certified copy of that individual’s authority. The effective date shall be the date the agent or attorney-in-fact signs each bond and shall be shown with the evidence of authority.
- C. Contractor shall notify Owner and Engineer if the surety on any bond has its right to do business in the state of Georgia terminated, becomes insolvent, is declared bankrupt or no longer meets the requirements of Paragraph 5.01.B. The Contractor shall provide another bond and surety within 20 days of notification of Owner and Engineer.

5.02 *Licensed Sureties and Insurers*

- A. All surety or insurance companies used by Contractor must be duly licensed or authorized to issue bonds or insurance policies for the limits and coverages required within the state of Georgia. Any additional requirements in Sections 00610 or 00620 or the Supplementary Conditions must also be met by any surety or insurance company used by Contractor.

5.03 *Certificates of Insurance*

- A. Certificates of insurance that Contractor is required to purchase and maintain, must be delivered to Owner by Contractor with copies to each additional insured and loss payee shown in the Supplementary Conditions.
- B. Contractor is obligated to maintain such insurance regardless of failure of Owner to demand evidence or certificates of Contractor’s compliance with insurance requirements or failure of Owner to find any deficiency in the compliance from the documentation provided by Contractor.
- C. Owner does not claim that Contractor will be adequately protected by the insurance coverage and limits required by this Contract.
- D. Contractors required insurance and insurance limits will not be interpreted as a limitation on Contractor’s liability under the indemnities granted to Owner by the Contract Documents.

5.04 *Contractor’s Insurance*

- A. Insurance shall be purchased and maintained by Contractor that is appropriate for Work being performed and provides protection from any claims that may arise as a result of Contractor’s performance of the Work or any other obligations under the Contract Documents, regardless if it is performed by Contractor or any Subcontractor or Supplier, or anyone directly or indirectly employed by Contractor to perform any of the Work, or anyone whose acts they may be liable for:

1. disability benefits and other similar employee benefit acts claimed under workers' compensation;
2. damages claimed due to bodily injury, occupational sickness or disease or death of Contractor's employees or any person other than Contractor's employees;
3. damages claimed due to bodily injury, sickness or disease or death of any person other than Contractor's employees;
4. claims for damages that are insured by personal injury liability coverage that are sustained by:
 - a. any person as a result of an offense that is related either directly or indirectly to the employment of said person by Contractor; or
 - b. any other person for any reason.
5. damages claimed, other than to the work itself, due to injury to or destruction of tangible property regardless of location, which also includes loss of use as a result of such; and
6. damages claimed due to bodily injury or death of any person or any property damage arising from the ownership, maintenance or use of any motor vehicle.

B. The policies of insurance required by this Paragraph 5.04 shall:

1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6, be written on an occurrence basis, include Owner, Engineer and any other individuals or entities identified in Supplementary Conditions as additional insureds, all shall be listed as additional insureds, and coverage should be included for the respective officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of all such additional insureds and the insurance provided to the additional insureds must provide primary coverage for all claims covered by means of that;
2. include at minimum the specific coverages and be written to equal or exceed the limits of liability required by the Supplementary Conditions or required by Laws or Regulations, whichever is greater;
3. contain contractual liability insurance to cover indemnity obligations of the Contractor as described in Paragraphs 6.11 and 6.20;
4. contain a provision stating the coverage will not be canceled, renewal refused or materially changed until at minimum thirty days after written notice has been given to Owner, Contractor and to both Owner and Contractor's additionally insured that are identified in the Supplementary Conditions to whom a certificate of insurance has been issued;
5. be in effect until final payment and any time after final payment when Contractor may be correcting, removing or replacing defective work in accordance with Paragraph 13.07;

and

6. include completed operations coverage:
 - a. insurance will remain in effect for two years after final payment.
 - b. Owner and each other additional insured shall be furnished with evidence of continued insurance at final payment and one year after by Contractor.

5.05 *Owner's Liability Insurance*

- A. Owner may choose to purchase and maintain at Owner's expense liability insurance to protect Owner against claims that may arise because of operations under the Contract Documents.

5.06 *Property Insurance*

- A. Property insurance will be purchased and maintained by Owner for the Site in the amount of full replacement cost unless otherwise provided in the Supplementary Conditions. This insurance shall:
 1. provide coverage for Owner, Engineer, Contractor, Subcontractors and any other individual or entities identified by the Supplementary conditions and anyone whom is deemed to have an insurable interest and shall be listed as a loss payee;
 2. provide coverage for physical loss or damage to the Work, falsework, materials and equipment in transit and temporary buildings. At minimum it shall insure against: fire, theft, water damage, debris removal, collapse, earthquake, vandalism or malicious mischief, lightning, extended coverage, demolition occasioned by enforcement of Laws and Regulations and any other cause of loss required by Supplementary Conditions;
 3. provide coverage for expenses incurred due to repair or replacement of any insured property;
 4. provide coverage for stored materials and equipment at the Site or at another location agreed upon by Owner in writing, provided that said materials and equipment have been included in an Application for Payment;
 5. allow Owner to partially utilize the Work;
 6. include startup and testing; and
 7. provide continued coverage until final payment is made unless an agreement is made in writing between Owner, Engineer and Contractor and thirty days written notice given to each other loss payee that has been issued a certificate of insurance.
- B. As required by the Supplementary Conditions or Laws and Regulations, Owner shall purchase and maintain insurance to cover equipment breakdown or additional property insurance that

includes the interests of Owner, Engineer, Contractor, Subcontractor and any other individual or entities identified by the Supplementary Conditions.

- C. A provision or endorsement is required for all purchased and maintained insurance policies stating the coverage will not be canceled, materially changed or renewal refused until thirty days prior notice has been given to Owner, Engineer, Contractor and any other loss payee who was issued a certificate of insurance.
- D. It will not be the responsibility of the Owner to purchase and maintain any property insurance to protect the interests of Contractor, Subcontractors or others in the Work to the extent of any deductible amounts identified in the Supplementary Conditions. The Contractor, Subcontractor or others may purchase and maintain property insurance coverage at their own expense due to each bearing a risk of loss of an identified deductible amount.
- E. Contractor may request in writing any other special insurance to be included in the property insurance policies provided in this Paragraph 5.06. If possible, Owner shall include said insurance with the cost being charged to Contractor through a Change Order. Owner will inform Contractor whether or not such insurance was purchased by Owner prior to the beginning of Work at the Site.

5.07 Waiver of Rights

- A. The intent of Owner and Contractor is for all policies purchased in accordance with Paragraph 5.06 to protect Owner, Engineer, Contractor, Subcontractors and all other individuals or entities identified in the Supplementary Conditions as loss payees with said policies. It is also their intent to provided primary coverage for all losses and damages through said policies. Provisions shall be contained in all policies to provide that insurers will have no rights of recovery against any of the insureds or loss payees should any payment of any loss or damage be made. Owner and Contractor waive: (i) all rights against one another, their officers, directors, members, partners, employees, agents, consultants and subcontractors for any and all losses and damages due to any of the perils or causes of loss that are covered by said policies or any of the property insurance applicable to the Work; (ii) all rights against Subcontractors and any loss payees, as identified by the Supplementary Conditions, under said policies for losses and damages they cause. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.
- B. To the extent permitted by Georgia law, Owner waives all rights against Contractor, Subcontractor and their officers, directors, members, partners, employees, agents, consultants and subcontractor for:
 - 1. loss caused by business interruption, loss of use, or other loss extending beyond direct physical loss or damage to Owner's property or the Work as a result of fire or other peril whether or not insured by Owner; and
 - 2. loss or damage to the finished Project or part of the Project due to fire or other insured peril or any other cause of loss covered by any property insurance that is maintained by

the Owner during partial utilization in accordance with Paragraph 14.05, after Substantial Completion in accordance with Paragraph 14.04 or after final payment in accordance with Paragraph 14.07.

- C. Provisions shall be included in any insurance policy maintained by Owner to prevent insurer from any recovery against Engineer, Contractor, Subcontractors and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each in the event of payment by insurer for any loss, damage or consequential loss.

5.08 Receipt and Application of Insurance Proceeds

- A. Any insured loss will be adjusted with Owner and made payable to Owner as fiduciary for the loss payees. Any money received will be deposited by Owner in a separate account and distributed in accordance with said agreement to the parties of interest. Unless a special agreement is reached, the money received will be applied to the repair or replacement of the Work and the cost will be covered by a Change Order.
- B. Unless one of the parties of interest objects in writing within fifteen days of an occurrence of loss, the Owner will have the power to adjust and settle any loss with the insurers. If an objection is made, it will be the responsibility of the Owner to adjust and settle any loss with the insurers in accordance to the new agreement. If no agreement is reached between the parties of interest, the Owner will adjust and settle the loss with insurers and if required in writing by any party of interest, Owner will be required to give bond for the proper performance of said duties.

5.09 Acceptance of Bonds and Insurance; Option to Replace

- A. If any objection is made concerning coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by either party in accordance with Article 5 based on non-conformance with the Contract Documents by either Owner or Contractor, the objecting party must inform the other party in writing within ten days of receipt of the certificates required by Paragraph 2.01.B. Both Owner and Contractor will be responsible for providing the other with additional information concerning insurance provided. If either of the parties does not purchase or maintain all of the required bonds and insurance as identified in the Contract Documents, that party must inform the other party in writing of their failure to purchase or maintain adequate bonds or insurance before the start or during the Work, before any change is made to the required coverage.

5.10 Partial Utilization, Acknowledgement of Property Insurer

- A. If it becomes necessary for the Owner to occupy a portion or portions of the Work prior to Substantial Completion of all of the Work, as described in Paragraph 14.05, occupancy must not begin until after the insurers providing property insurance have been notified in writing and make the necessary changes in coverage. The property insurance shall not be canceled or allowed to lapse due to partial use or occupancy.

ARTICLE 6 – CONTRACTOR’S RESPONSIBILITIES

6.01 *Supervision and Superintendence*

- A. The Contractor, in accordance with the Contract Documents, is responsible for competently supervising, inspecting and directing the Work. Means, methods, techniques, sequences and procedures of construction will be the responsibility of the Contractor. Any negligence by the Owner or Engineer in the design or specification of a specific means, method, technique, sequence or procedure of construction shown and required by the Contract Documents will not be the responsibility of the Contractor.
- B. The Contractor must provide a competent resident superintendent to reside over the Work at all times. The superintendent must not be replaced without written notice to Owner and Engineer, unless extraordinary circumstances come about.
- C. The Contractor shall have the sole responsibility of contacting any Utility owner with any facilities present at the site prior to any excavation. Contractor shall also be responsible for contacting Utilities Protection Center of Georgia prior to any excavation at the site.

6.02 *Labor; Working Hours*

- A. It will be the responsibility of the Contractor to provide competent, qualified personnel to survey and lay out the Work as well as perform construction as mandated by the Contract Documents. While on the Site, the Contractor must display good discipline and order at all times during the progress of the Work.
- B. All Work at the Site shall be performed during regular working hours unless required for the safety or protection of persons, the Work or the Site and except as stated in the Contract Documents. Contractor shall notify Owner in writing no later than the Wednesday prior to the Saturday, Sunday or legal holiday that Contractor intends to work. Owner's written consent is required for Contractor to be permitted to work on a Saturday, Sunday or any legal holiday.

6.03 *Services, Materials, and Equipment*

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.
- B. All materials and equipment to be used for the Work shall be of good quality and new, unless otherwise noted in the Contract Documents. All of the special warranties and guarantees required by the Specifications will be to the benefit of Owner. Contractor may be required by Engineer to provide evidence to verify the source, kind and quality of all materials and equipment used for the Work.
- C. All materials and equipment shall be stored, installed, applied, erected, protected, connected, cleaned, used and conditioned to the specifications required by the Supplier unless otherwise noted in the Contract Documents.

6.04 *Progress Schedule*

- A. The Progress Schedule shall be followed by the Contractor as provided by Paragraph 2.07. Progress Schedule may be adjusted from time to time as provided below.
 - 1. Any proposed adjustments in the Progress Schedule that will not result in a change in the Contract Times must be submitted to Engineer by Contractor.
 - 2. Contractor shall submit any proposed adjustments to the Progress Schedule, which will change the Contract Times, in accordance with the requirements of Article 12. A Change Order is required for adjustments in Contract Times.

6.05 *Substitutes and "Or-Equals"*

- A. Any time an item of material or equipment is specified by using the name of a proprietary item or naming a particular Supplier in the Contract Documents, the intent is to establish the type, function, appearance and quality required. No substitution will be permitted if the description of an item of material or equipment is followed by words reading that no like, equivalent, "or-equal" item or no substitution permitted. For all other items of different Suppliers, Contractor may submit for Engineer to review under the following circumstances:
 - 1. *"Or-Equal" Items:* If an item of material or equipment proposed by Contractor is determined by the Engineer to be functionally equal and sufficiently similar to the named item and result in no change in related Work, that item of material or equipment will be considered "or-equal" by the Engineer. The review and approval of an "or-equal" item does not require compliance with some or all of the requirements for approval of proposed substitute items. A proposed item of material or equipment will be considered equal to an item so named if:
 - a. Engineer determines through reasonable judgment that:
 - 1) at minimum it is equal in materials of construction, quality, durability, appearance, strength and design characteristics;
 - 2) it will achieve the desired results of the Project as a whole and it will equally and reliably perform the desired function; and
 - 3) it is available for responsive service and has an established record of performance.
 - b. If approved for and used for the completion of the Work, Contractor certifies that:
 - 1) change will not result in an increase in cost for the Owner or an increase in Contract Times; and
 - 2) this item will significantly conform to the detailed requirements in the

Contract Documents of the item name.

2. *Substitute Items:*

- a. If an item of material or equipment proposed by Contractor is determined by Engineer to not qualify as an “or-equal” item as described in Paragraph 6.05.A.1, it will be considered a proposed substitute item.
- b. It will be the responsibility of the Contractor to provide Engineer with sufficient information of the item of material or equipment for the determination of its equivalence and its ability to serve as a substitute. Engineer will only accept requests for review of proposed substitute items of material or equipment from the Contractor.
- c. Paragraph 6.05.A.2.d sets the requirements for review by Engineer.
- d. It is the responsibility of the Contractor to apply for review of a proposed substitute item of material or equipment in writing. The application:
 - 1) shall certify that the proposed substitute item will:
 - a) sufficiently perform the functions and accomplish all of the intended results of the general design,
 - b) be similar in substance to that specified, and
 - c) be intended for the same use as that specified;
 - 2) will state:
 - a) any effect the use of the proposed substitute item will have on the date of Substantial Completion,
 - b) if use of the proposed substitute item will require an adaptation to the design of the Work and therefore result in a change to any of the Contract Documents, and
 - c) if use of the proposed substitute item will result in any license fee or royalty payment;
 - 3) will identify;
 - a) any and all differences between the specified item and the proposed substitute item, and
 - b) all available sales, engineering, repair, maintenance and replacement services; and

- 4) shall include an itemized estimate of all costs or credits resulting either directly or indirectly due to the use of the proposed substitute item. The costs of redesign and any claims by other contractors that will be affected by the change must be included in the itemized estimate.
- B. *Substitute Construction Methods or Procedures:* Contractor may use a substitute means, method, technique, sequence or procedure of construction in place of a specific means, method, technique, sequence or procedure of construction, which is required by the Contract Documents, only with Engineers approval. It will be the responsibility of the Contractor to submit adequate information to Engineer for the determination of the equivalency of the proposed substitute to the requirements of the Contract Documents. The requirements for review will be similar to the requirements in Paragraph 6.05.A.2.
- C. *Engineer's Evaluation:* A reasonable amount of time will be allowed for Engineer to evaluate each and every proposal made pursuant to Paragraphs 6.05.A and 6.05.B. Additional data about the proposed substitute item may be required by the Engineer and shall be furnished by the Contractor. The sole judge of acceptability will be the Engineer. At the conclusion of Engineer's review a determination will be identified by a Change Order for a substitute and an approved Shop Drawing for an "or-equal". Contractor will be notified in writing of any negative determination.
- D. *Special Guarantee:* Contractor may be required, at their own expense, to acquire a special performance guarantee or other surety with respect to any substitute.
- E. *Engineer's Cost Reimbursement:* Engineer will document all costs incurred by Engineer during the evaluation of a proposed substitute in accordance with Paragraphs 6.05.A.2 and 6.05.B. Regardless if Engineer approves a proposed or submitted substitute, Contractor shall compensate Engineer for all costs incurred during the evaluation of such proposed substitute. Contractor shall also compensate Engineer for all costs incurred from making adjustments in the Contract Documents that are consequential to the acceptance of a proposed substitute.
- F. *Contractor's Expense:* Any expenses incurred by Contractor from providing data in support of any proposed substitute or "or-equal" will be the responsibility of the Contractor.

6.06 *Concerning Subcontractors, Suppliers, and Others*

- A. Any Subcontractor, Supplier or other individual or entity that Owner has a reasonable objection against shall not be employed by the Contractor. Contractor shall not be required by Owner to employ any Subcontractor, Supplier or other individual or entity against whom Contractor has any reasonable objection.
- B. 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.
- C. Contractor may be required by the Supplementary Conditions to provide Owner with the

identity of certain Subcontractors, Suppliers or other individuals or entities at a date prior to the Effective Date of the Agreement in order for Owner to approve of Subcontractors, Suppliers or other individuals or entities. After investigation, Owner's acceptance (either in writing or by not making a written objection by the date for acceptance in the Bidding Documents or the Contract Documents) may be revoked due to reasonable objection. If Owner rejects any Subcontractor, Supplier or other individual or entity, it will be the responsibility of the Contractor to submit to Owner an acceptable replacement. A Change Order will be issued if an adjustment to the Contract Price is necessary due to the replacement. Owner maintains the right to reject defective Work regardless of acceptance of any Subcontractor, Supplier or other individual or entity.

- D. All acts and omissions of the Subcontractors, Suppliers and other individuals or entities while performing or furnishing any of the Work will be the sole responsibility of the Contractor. Nothing in the Contract Documents shall:
 - 1. create any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity for the benefit of any such Subcontractor, Supplier or other individual or entity.
 - 2. obligate Owner to pay or see to the payment of any such Subcontractor, Supplier or other individual or entity unless required by Laws and Regulations.
- E. Scheduling and Coordinating the Work of Subcontractors, Suppliers and other individuals or entities performing or furnishing any of the Work, whether in direct or indirect Contract with Contractor, will be the sole responsibility of Contractor.
- F. Subcontractors, Suppliers and other individuals or entities will be required by Contractor to communicate with Engineer through Contractor.
- G. Contractor will not be restricted by the divisions and sections of the Specifications and identifications of any Drawings for the division of any Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- H. Subcontractor or Supplier will be bound to the applicable terms and conditions of the Contract Documents for all Work performed for Contractor by an appropriate agreement between Contractor and the Subcontractor or Supplier. Any agreement between Contractor and Subcontractor or Supplier who is listed as a loss payee on the property insurance according to Paragraph 5.06, will contain provisions that waive all rights of the Subcontractor or Supplier against Owner, Engineer, Contractor and all other loss payees listed in the Supplementary Conditions for any and all losses and damages caused by, relating to, resulting from or arising out of any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. Contractor must obtain any separate waiver forms that may be required by insurers of any such policies and have them signed by any Subcontractor or Supplier.

6.07 Patent Fees and Royalties

- A. If any invention, design, process, device or product, which is subject to patent rights or copyrights of others, is used in the performance of the Work or is incorporated into the Work the Contractor will be responsible to pay all license fees and royalties and assume all costs incident therefore.
- B. If any invention, design, process, product or device is specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty as required by patent rights or copyrights, for incorporation in the Work or in the performance of the Work and results in any claims, costs, losses and damages due to patent rights or copyright infringement, Owner shall indemnify and hold harmless Contractor to the fullest extent permitted by Laws and Regulations against all claims, costs, losses and damages.
- C. If any invention, design, process, product or device not specified in the Contract Documents is incorporated in the Work or in the performance of the Work and results in any claims, costs, losses and damages due to patent rights or copyright infringement, Contractor shall indemnify and hold harmless Owner and Engineer to the fullest extent permitted by Laws and Regulations against all claims, costs, losses and damages.

6.08 *Permits*

- A. It is the responsibility of the Contractor to obtain and pay for all construction permits and licenses unless noted otherwise in the Supplementary Conditions. Owner will assist Contractor in obtaining any necessary permits and licenses. Any governmental charges and inspection fees necessary for the execution of the Work, which are applicable at the time of opening of Bids or, in the case of no Bids, on the Effective Date of the Agreement, shall be paid by the Contractor. Any charges resulting from connections providing permanent service to the Work by utility owners shall be paid by the Owner.

6.09 *Laws and Regulations*

- A. It is the responsibility of the Contractor to comply and give all notices required by all Laws and Regulations that apply to the performance of the Work. Neither Owner nor Engineer shall be responsible for ensuring Contractor's compliance with any Laws or Regulations unless required by Laws and Regulations.
- B. Contractor shall bear all claims, costs, losses and damages that arise due to or relating to the performance of the Work in which Contractor knows or has reason to know that it is contrary to any Laws or Regulations. It is not the responsibility of the Contractor to verify that the Specifications and Drawings are in accordance with Laws and Regulations, but the Contractor is still obligated to the requirements of Paragraph 3.03.
- C. An adjustment in Contract Price or Contract Times will be made if any changes in Laws or Regulations that effect either the cost or time of performance of the Work arise that were not known at the time of opening of Bids. A Claim may be made as provided in Paragraph 10.05 if Owner and Contractor are unable to agree upon any necessary adjustment.

6.10 *Taxes*

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

6.11 *Use of Site and Other Areas*

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

1. All construction equipment, stored materials and equipment and the operations of workers shall be confined to the Site and other areas permitted by Laws and Regulations by the Contractor. The Site and other areas shall never be encumbered with construction equipment or other materials or equipment. Any damage to any land or area or to the owner or occupant of land or any adjacent land or area that occurs from the performance of the Work will be the sole responsibility of the Contractor.
2. It is the responsibility of the Contractor to promptly settle by negotiation or resolve by arbitration or other dispute resolution process any claim made by any owner or occupant as a result of the performance of the Work.
3. If any claim or action, legal or equitable, brought by any such owner or occupant is made based upon Contractor's performance of the Work, Contractor shall indemnify and hold harmless Owner and Engineer to the fullest extent permitted by Laws and Regulations against all claims, costs, losses and damages.

- B. *Removal of Debris during Performance of the Work:* Contractor shall keep the Site and other areas void of any waste materials, rubbish and other debris throughout the progress of the Work.

- C. *Cleaning:* It is the responsibility of the Contractor to clean the Site and the Work and make it ready for use by Owner prior to Substantial Completion of the Work. Contractor shall also remove all tools, appliances, construction equipment and machinery and surplus materials from the Site and all property not shown for modification by the Contract Documents shall be restored to original condition at the conclusion of the Work.

- D. *Loading Structures:* Contractor shall not load or permit the loading of any structure in a way that may compromise the structure. No part of the Work or any adjacent property shall be subjected to stresses or pressures that will endanger it by the Contractor.

6.12 *Record Documents*

- A. Record Documents shall be maintained in accordance with Section 01 70 00.

6.13 *Safety and Protection*

- A. It is the sole responsibility of the Contractor to initiate, maintain and supervise all safety programs and precautions that are related to the Work. It is the responsibility of Subcontractors to perform their work in a manner that provides safety for the persons or property that is part of

their work. Subcontractors shall also comply with all applicable safety Laws and Regulations. It is the responsibility of the Contractor to provide all necessary protection for the prevention of damage, injury or loss to as well as taking all necessary precautions for the safety of:

1. all persons who may be affected by the Work who are present at the Site;
 2. all work, materials and equipment that will be incorporated into the Work, whether on or off the Site in storage; and
 3. other property, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities and Underground Facilities that are not designated for removal, relocation or replacement during the course of construction, at or adjacent to the Site.
- B. All applicable Laws and Regulations related to the safety of persons or property, or the protection of persons or property from damage, injury or loss must be complied with by Contractor. All safeguards that are necessary for the safety and protection of persons or property must be erected and maintained by Contractor. Owners of adjacent property, of Underground Facilities and utility owners must be notified by Contractor prior to execution of any Work that may affect them. Contractor shall also assist them in the protection, removal, relocation and replacement of their property.
- C. Owner's safety programs are identified in Part 20 of the Supplementary Conditions and will be the safety requirements the Contractor shall comply with.
- D. Owner and Engineer shall be notified of any specific requirements of Contractor's safety program in order to ensure compliance by Owner's and Engineer's employees while at the Site.
- E. Contractor shall remedy all damage, injury or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 that is caused, directly or indirectly, in whole or in part by Contractor, any Subcontractor, Supplier or any other individual or entity that is employed directly or indirectly by any of them for the performance of any of the Work or anyone whose acts any of them may be liable for. Contractor shall not be liable for any damage, injury or loss that is attributable to the fault of Drawings, Specifications, acts or omissions of Owner, Engineer or anyone employed by the Owner and is not attributable to the fault or negligence of Contractor, Subcontractor, Supplier or other individual or entity directly or indirectly employed by any of them.
- F. Contractor shall initiate, maintain and supervise all safety precautions and protection of the Work until Engineer issues Contractor with a written notice, in accordance with Paragraph 14.07.B, stating the Work is acceptable and complete.

6.14 *Safety Representative*

- A. An experienced and qualified safety representative shall be designated to the Site by the Contractor. The safety representative shall be responsible for maintaining and supervising safety precautions and programs and the prevention of accidents.

6.15 *Hazard Communication Programs*

- A. It is the responsibility of the Contractor to coordinate between and among employers at the Site the exchange of material safety data sheets or other hazard communication information in accordance with Laws or Regulations.

6.16 *Emergencies*

- A. Contractor shall act in a way to prevent damage, injury or loss of persons, the Work, property at the Site or adjacent to the Site in the event of any emergency that may affect the safety or protection of such. If Contractor believes any significant changes in the Work or variations from the Contract Documents have resulted from action taken by Contractor in response to such an emergency Contractor shall promptly provide Engineer with written notice. Engineer may issue a Change Order or a Work Change Directive if Engineer determines that the action taken by Contractor in response to such an emergency requires a change in the Contract Documents.

6.17 *Shop Drawings and Samples*

- A. Shop Drawings and Samples shall be submitted by Contractor to Engineer as required by Paragraph 2.07 in accordance with Section 01 33 00. Each submittal will be identified as required by Engineer.
 - 1. *Shop Drawings:*
 - a. Submit required number of copies as specified in Section 01 33 00.
 - b. Shop Drawings will clearly and completely show quantities, dimensions, specified performance, design criteria, materials and similar data to allow Engineer to review and determine, as required by Paragraph 6.17.D, the services, materials and equipment proposed by Contractor.
 - 2. *Samples:*
 - a. Submit required number of Samples as specified in Section 01 33 00.
 - b. Supplier, material, pertinent data such as catalog numbers, intended use and other data shall be clearly identified for each Sample to allow Engineer to review the submittal as required by Paragraph 6.17.D.
- B. Any Work specified by the Contract Documents or the Schedule of Submittals to require a Shop Drawing or Sample and is performed prior to Engineer's review and approval of submittal will be the sole expense and responsibility of Contractor.
- C. *Submittal Procedures:*
 - 1. Prior to the submission of each Shop Drawing or Sample, Contractor shall have:
 - a. reviewed and coordinated each Shop Drawing with the requirements of the Work

and the Contract Documents;

- b. with respect to Shop Drawing or Samples, determined and confirmed all field measurements, quantities, dimensions, installation requirements, materials, catalog numbers, specified performance and design criteria and similar information;
 - c. with respect to the specified application fabrication, shipping, handling, storage, assembly and installation, determined and confirmed the suitability of all materials offered pertaining to the performance of the Work; and
 - d. determined and confirmed means, methods, techniques, sequences, procedures of construction and safety precautions that are the responsibility of the Contractor.
2. A stamp or written certification is required of each submittal to show that Contractor has satisfied the review and approval of submittals as required by the Contract Documents.
 3. Contractor shall include written notice with any submittal to Engineer in which the Shop Drawing or Sample varies from the requirements of the Contract Documents. For Engineer's review and approval two notices are required: (i) one shall be a written communication that is separate from the Shop Drawings or Sample submittal and (ii) a notation made on each Shop Drawing or Sample.

D. *Engineer's Review:*

1. Shop Drawings and Samples will be reviewed by Engineer in a timely manner in accordance with the Schedule of Submittals. The review and approval will be to determine the conformity of the items covered by the submittals to the information given in the Contract Documents after installation or incorporation into the Work. The review will also determine if the items covered by the submittals will be compatible, as indicated by the Contract Documents, to the design concept of the finished Project as a functioning whole.
2. Means, methods, techniques, sequences, procedures of construction (unless specific means, methods, techniques, sequences or procedures of construction are required by the Contract Documents) or safety precautions or programs will not be reviewed or approved by Engineer.
3. Contractor shall be responsible for any variation from the requirements of the Contract Documents regardless of Engineer's review and approval except when Contractor has complied with the requirements of Paragraph 6.17.C.3 and written approval of each written notation incorporated in or accompanying the Shop Drawing or Sample has been given by Engineer. Contractor shall not be relieved from responsibility of complying with the requirements of Paragraph 6.17.C.1 regardless of review and approval by Engineer.

E. *Resubmittal Procedures:*

1. All corrections required by Engineer shall be made by Contractor and the required number of corrected copies of Shop Drawings shall be returned and if required new Samples submitted for review and approval.

6.18 *Continuing the Work*

- A. During all disputes or disagreements with Owner, Contractor shall continue the Work and adhere to the Progress Schedule. Except with a written agreement between Owner and Contractor, no Work shall be delayed or postponed by any dispute or disagreement except as permitted by Paragraph 15.04.

6.19 *Contractor's General Warranty and Guarantee*

- A. All Work shall be warranted and guaranteed to Owner to be in accordance with the Contract Documents and free of defects by Contractor.
- B. Warranty and guarantee by the Contractor excludes defects or damage caused by:
 1. abuse, modification or improper maintenance or operation by any person other than Contractor, Subcontractor, Supplier or any other person who is the responsibility of the Contractor; or
 2. wear and tear as the result of normal usage.
- C. The Work shall be performed and completed in absolute accordance with the Contract Documents by the Contractor. The following will not establish an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's requirements to execute the Work as required by the Contract Documents:
 1. observations by Owner or Engineer;
 2. any progress or final payment by Owner;
 3. any payment related to or issuance of a certificate of Substantial Completion by Owner or Engineer;
 4. Owner's use or occupancy of any part of the Work;
 5. a Shop Drawing or Sample submittal that is reviewed and approved by Engineer or the issuance of a notice of acceptability by Engineer;
 6. any inspection, test or approval by others; or
 7. the correction of any defective Work by Owner.

6.20 *Indemnification*

- A. Contractor shall indemnify and hold harmless Owner, Engineer and Owner's, officers, directors, members, partners, employees, agents, consultants and subcontractors to the fullest extent permitted by Laws and Regulations against all claims, costs, losses and damages that arise out of or are related to the performance of the Work provided that said claim, cost, loss or damage is a result of bodily injury, sickness, disease, death or injury to or destruction of tangible property, that includes the loss of use that is attributable to an omission or negligent act by Contractor, Subcontractor, Supplier or other individual directly or indirectly employed by any of them for the performance of any of the Work or anyone whose acts they are liable for.
- B. The indemnification obligation under Paragraph 6.20.A shall not be limited based on the amount or type of damages, compensation or benefits payable in any way by or for Contractor or any Subcontractor, Supplier or other individual or entity under workers' compensation acts, disability benefit acts or other employee benefit acts for any and all claims against Owner, Engineer or any of Owner's officers, directors, members, partners, employees, agents, consultants or subcontractors by any employee of Contractor, Subcontractor, Supplier or any individual or entity directly or indirectly employed by any of them for the performance of any of the Work.
- C. The Contractor shall not be obligated to indemnify, under Paragraph 6.20.A, the liability of the Engineer arising from:
 - 1. the preparation, failure to prepare, approval or failure to approve of maps, Drawings, opinions, reports, surveys, Change Orders, designs or specifications; or
 - 2. giving or failing to give instructions or directions, if that is the primary cause of the injury or damage.

6.21 *Delegation of Professional Design Services*

- A. The obligations of providing professional design services will not be the responsibility of the Contractor except when: (i) Contract Documents require such services for a portion of the Work or (ii) the execution of Contractor's responsibilities for construction means, methods, techniques, sequences and procedures require such services. Contractor shall not be required to provide professional services that will result in the violation of any applicable law.
- B. Engineer will specify all performance and design criteria that must be satisfied if professional design services or certifications by a design professional, in relation to systems, materials or equipment, are required of Contractor by the Contract Documents. All service or certifications that are the responsibility of the Contractor must be provided by a properly licensed professional. All drawings, calculations, specifications, certifications, Shop Drawings and other submittals must bear the signature and seal of such professional. If Shop Drawings and other submittals that are related to the Work are prepared by others and designed or certified by such professional, such professional's written approval must be submitted to Engineer.
- C. Provided Owner and Engineer have specified to Contractor all performance and design criteria that such service must satisfy, Owner and Engineer shall be allowed to rely on the services, certifications or approvals performed by such design professionals based on the adequacy,

accuracy and completeness of the design.

- D. In accordance with this Paragraph 6.21, review and approval of design calculations and drawings by Engineer will only be to ensure that such calculations and drawings conform to the performance and design criteria and concept expressed in the Contract Documents. Review and approval by Engineer of Shop Drawings and other submittals (except design calculations and design drawings) will be performed only for the purpose stated in Paragraph 6.17.D.1.
- E. The adequacy of the Contract Documents for performance or design criteria shall not be the responsibility of Contractor.

ARTICLE 7 – OTHER WORK AT THE SITE

7.01 Related Work at Site

- A. Owner is allowed to perform other work at the Site that is related to the Project with Owner's employees, through other direct contracts or by utility owners. If no note of such other work is in the Contract Documents, then:
 - 1. Contractor will be given written notice prior to any such other work starting; and
 - 2. if no adjustment in the Contract Price or Contract Times, as a result of such other work, can be agreed upon by Owner and Contractor, a Claim may be made as provided in Paragraph 10.05.
- B. Contractor shall afford proper and safe access to the Site, reasonably accommodate the introduction and storage of materials and equipment and the execution of such other work and coordinate such work with their Work to each contractor who is a party to a direct contract with Owner, each utility owner and Owner if Owner's employees are performing any of the other work. Any cutting, fitting or patching of the Work that is required to properly connect or integrate such other work will be the responsibility of the Contractor. Any cutting, excavating or altering of any work of others shall not be allowed by Contractor; however with written consent of Owner and others whose work will be affected Contractor may cut or alter others' work. The duties and responsibilities in this Paragraph of Contractor are for the benefit of other contractors and utility owners while provisions in said direct contracts between Owner and such utility owners and other contractors exist for the benefit of Contractor.
- C. It is the responsibility of Contractor to inspect work of others if any part of Contractor's Work is dependent upon the proper execution or results of work performed by others under this Article 7. If any delays, defects or deficiencies are found in the work of others that render it unavailable or unsuitable for the proper execution and results of Contractor's Work, Contractor must promptly notify Engineer in writing. If Contractor fails to report any delays, defects or deficiencies it will constitute Contractor's acceptance of such other work as satisfactory for integration with Contractor's Work except in the case of latent defects and deficiencies in such other work.

7.02 Coordination

- A. If the performance of other work on the Project at the Site is intended to be contracted to others by Owner, the following will be stated in the Supplementary Conditions:
 - 1. identification of the individual or entity who will have the authority and responsibility for coordination of activities between the various contractors;
 - 2. itemization of specific matters covered by such authority and responsibility;
 - 3. extent of such authority and responsibilities.
- B. Authority and responsibility for coordination will be the responsibility of the Owner unless otherwise provided for in the Supplementary Conditions.

7.03 *Legal Relationships*

- A. Paragraphs 7.01.A and 7.02 do not apply to any utilities that are not under the control of Owner.
- B. Other contractors under direct contract to Owner are liable to Owner and Contractor, under Paragraph 7.01, for contractor's wrongful actions or inactions that result in direct delay and disruption costs incurred by Contractor.
- C. Contractor under direct contract to Owner is liable to Owner and any other contractor for Contractor's wrongful actions or inactions that result in direct delay and disruption costs incurred by such other contractor.

ARTICLE 8 – OWNER'S RESPONSIBILITIES

8.01 *Communications to Contractor*

- A. Unless otherwise stated in these General Conditions, all communications of Owner to Contractor shall be directed through Engineer.

8.02 *Furnish Data*

- A. Data required of Owner under the Contract Documents shall be promptly furnished by Owner.

8.03 *Pay When Due*

- A. As provided in Paragraphs 14.02.C and 14.07.C, Owner shall make payments when they are due to Contractor.

8.04 *Lands and Easements; Reports and Tests*

- A. As set forth in Paragraphs 4.01 and 4.05, Owner shall provide lands, easements and engineering surveys for the establishment of reference points. Owner shall identify and make available

copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions that relate to the existing surface or subsurface structures at the site for Contractor as required by Paragraph 4.02.

8.05 *Insurance*

- A. All responsibilities of Owner to purchase or maintain liability and property insurance are set forth in Article 5.

8.06 *Change Orders*

- A. As indicated in Paragraph 10.03, it is the obligation of the Owner to execute Change Orders.

8.07 *Inspections, Tests, and Approvals*

- A. Paragraph 13.03.B indicates the responsibility of the Owner with respect to certain inspections, tests and approvals.

8.08 *Limitations on Owner's Responsibilities*

- A. Means, methods, techniques, sequences, procedures of construction, safety precautions and programs or failure of Contractor to comply with Laws and Regulations that apply to the performance of the Work will not be the responsibility of Owner to supervise, direct or have control or authority over. Contractor's failure to execute the Work as required by the Contract Documents will not be the responsibility of the Owner.

8.09 *Undisclosed Hazardous Environmental Conditions*

- A. Responsibility to an undisclosed Hazardous Environmental Condition of the Owner is described in Paragraph 4.06.

8.10 *Evidence of Financial Arrangements*

- A. If Contractor request, Owner is required to provide Contractor with evidence that financial arrangements have been made that will satisfy Owner's obligations under the Contract Documents.

8.11 *Compliance with Safety Program*

- A. In accordance with Paragraph 6.13.D, Contractor must inform Owner of any specific safety requirements mandated by the Contractor at the Site. All employees and representatives of the Owner must comply with any specific applicable requirements of Contractor's safety programs while at the site.

ARTICLE 9 – ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *Owner's Representative*

- A. Engineer will be Owner's representative throughout the construction of the project. The duties and responsibilities of Engineer, as Owner's representative, are described in the Contract Documents.

9.02 *Visits to Site*

- A. Engineer or a representative of the Engineer will routinely visit the Site to observe the progress that has been made and the quality of the various aspects of Contractor's executed Work. Engineer will determine from such visits, for the benefit of Owner, if the Work is progressing as required by the Contract Documents. Engineer will help keep Owner abreast of the progress of the Work and will strive to protect Owner from defective Work.
- B. Engineer will not supervise, direct, control, have authority over or be responsible for Contractor's means, methods, techniques, sequences, procedures of construction or the safety precautions and programs incident to the Project or for Contractor's failure to conform with Laws and Regulations relevant to the performance of the Work.

9.03 *Project Representative*

- A. Engineer may utilize a Resident Project Representative to allow more extensive observation of the Work. The authority and responsibility of such Resident Project Representative will be as provided in the Supplementary Conditions. The Resident Project Representative's responsibilities will be limited as provided in Paragraph 9.09.

9.04 *Authorized Variations in Work*

- A. Minor variations, which cause no adjustment in the Contract Price or Contract Times, in the Work from the requirements of the Contract Documents but that are compatible with the concept of the Project as a functioning whole may be authorized by Engineer. Any minor variations made will be accomplished by a Field Order and will be binding on Owner and Contractor, who will be responsible for the prompt performance of the Work. If an adjustment in the Contract Price or Contract Times is believed to be necessary by Owner or Contractor, a Claim may be made as provided in Paragraph 10.05.

9.05 *Rejecting Defective Work*

- A. If any Work is believed to be defective, not in conformance to the Contract Documents or compromise the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents by Engineer, Engineer shall have the authority to reject any such work. As provided in Paragraph 13.04, Engineer will also have authority to have special inspections or testing of the Work, regardless if the Work is fabricated, installed or completed.

9.06 *Shop Drawings, Change Orders, and Payments*

- A. See Paragraph 6.17 for Engineer's authority or limitations of authority in regards to Shop

Drawings and Samples.

- B. See Paragraph 6.21 for Engineer's authority or limitations of authority in regards to design calculations and design drawings submitted in response to a delegation of professional design services.
- C. See Articles 10, 11 and 12 for Engineer's authority in regards to Change Orders.
- D. See Article 14 for Engineer's authority in regards to Applications for Payment.

9.07 *Determination for Unit Price Work*

- A. The quantities and classifications of Unit Price Work performed by Contractor will be determined by Engineer. Before rendering a recommendation of an Application for Payment, Engineer will review Engineer's preliminary determinations on quantities and classifications of Unit Price Work with Contractor. Subject to the provisions of Paragraph 10.05, Engineer's decision will be final and binding upon Contractor.

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

- A. Responsibility for initial interpretation of the requirements of the Contract Documents and judgment of the acceptability of the Work will be the Engineer's. Engineer must be contacted within thirty days by Owner or Contractor about any concern that arises prior to the date final payment is due in regards to the acceptability of the Work and the interpretation of the requirements of the Contract Documents as they pertain to the performance of the Work.
- B. A written decision will promptly be rendered by Engineer on the issue. A Claim may be made under Paragraph 10.05 if an adjustment in the Contract Price or Contract Time is believed to be necessary. For the purposes of Paragraph 10.05.B, the date of Engineer's decisions shall be the date of the event giving rise to the issues referenced.
- C. Subject to the provisions of Paragraph 10.05, Engineer's written decision on the issue will be final and binding on Contractor.

9.09 *Limitations on Engineer's Authority and Responsibilities*

- A. No decision made by Engineer in the exercise or non-exercise of authority or responsibility of Engineer shall create, impose or give rise to any duty in contract, tort or otherwise owed by Engineer to Contractor, Subcontractor, Supplier, other individual or entity or any surety for or employee or agent of any of them.
- B. Contractor's means, methods, techniques, sequences, procedures of construction, safety precautions and programs or any failure to comply with Laws and Regulations that apply to the performance of the Work will not be supervised, directed or controlled by Engineer and Engineer will not be responsible or have authority of any such activity of Contractor. Any failure in the performance of the Work in accordance with the Contract Documents by Contractor will not be the responsibility of Engineer.

- C. No acts or omissions of Contractor or any Subcontractor, Supplier or other individual or entity performing any of the Work will be the responsibility of the Engineer.
- D. The review of the final Application of Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation to be delivered by Paragraph 14.07.A will be performed by Engineer to generally determine that their content or certified results satisfy the requirements of the Contract Documents.

ARTICLE 10 – CHANGES IN THE WORK; CLAIMS

10.01 Authorized Changes in the Work

- A. Owner or Engineer may order additions, deletions or revisions in the Work through a Change Order or a Work Change Directive at any time or from time to time without invalidating the Contract and without notification to any surety. Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents upon receipt of any such document.
- B. An adjustment in Contract Price or Contract Times will be made if any changes in Laws or Regulations that effect either the cost or time of performance of the Work arise that were not known at the time of opening of Bids. Claim may be made as provided in Paragraph 10.05 if Owner and Contractor are unable to agree upon any necessary adjustment.

10.02 Unauthorized Changes in the Work

- A. Contract Price will not be increased and Contract Times will not be extended for any work Contractor performs that is not a requirement of the Contract Documents as amended, modified or supplemented in Paragraph 3.04 except in the case of: (i) any emergency as provided in Paragraph 6.16, or (ii) uncovering Work as provided in Paragraph 13.04.D.

10.03 Execution of Change Orders

- A. Change Orders endorsed by Engineer covering the following shall be executed by Owner and Contractor:
 - 1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required due to acceptance or correction of defective Work under Paragraphs 13.08.A or 13.09, or (iii) agreed to by both parties;
 - 2. changes, which are agreed upon by both parties, in the Contract Price or Contract Times, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and
 - 3. changes which embody the substance of any written decision rendered by Engineer in the Contract Price or Contract Times in accordance with Paragraph 10.05; given that, an

appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations in lieu of executing any such Change Order, but Contractor shall adhere to the Progress Schedule and continue the execution of the Work during any such appeal in accordance with Paragraph 6.18.A.

10.04 *Notification to Surety*

- A. It will be the responsibility of the Contractor to notify any surety, if the provisions of any bond require notification, of any change that affects the general scope of the Work or the requirements of the Contract Documents. Each applicable bond must be adjusted to reflect the effect of any such change.

10.05 *Claims*

- A. *Engineer's Decision Required:* All Claims, except those waived in accordance with Paragraph 14.09, shall be submitted to Engineer for decision. Owner or Contractor must refrain from exercising any rights or remedies they have under the Contract Documents or by Laws and Regulations applicable to such Claims until a decision by Engineer has been rendered.
- B. *Notice:* Engineer shall be delivered written notice that states the nature of each Claim after the start but no later than sixty days after the event. The party making the Claim will bear the responsibility of substantiating the Claim. The Claimant shall deliver to Engineer and other party to the Contract, within sixty days after the start of such event, notice of the amount or extent of the Claim along with all supporting data. Paragraph 12.01.B provides the requirements for a Claim for an adjustment in Contract Price. Paragraph 12.02.B provides the requirements for a Claim for an adjustment in Contract Times. Claimant's written statement for each Claim must state that the claimed adjustment is the entire adjustment claimant believes it is entitled to as a result of such event.
- C. *Engineer's Action:* Each Claim will be reviewed by Engineer within thirty days after receipt of last submittal by Contractor and take one of the following actions in writing:
 - 1. deny the Claim in whole or in part; or
 - 2. approve the Claim.
- D. The Claim shall be considered denied if Engineer takes no action on a Claim within thirty days.
- E. Owner or Contractor will be bound to Engineer's written action under Paragraph 10.05.C or denial in accordance with Paragraph 10.05.D, unless Owner or Contractor invoke the dispute resolution procedure presented in Article 16 within thirty days of said action or denial.
- F. If Claim for an adjustment in Contract Price or Contract Times is not submitted as required by this Paragraph 10.05, the Claim will be considered invalid.

ARTICLE 11 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

11.01 *Cost of the Work*

- A. *Costs Included:* The sum of all cost necessarily incurred and paid by Contractor in the proper performance of the Work, except any excluded by Paragraph 11.01.B, will be termed Cost of the Work. Contractor will only be reimbursed those additional or incremental costs when the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined based on Cost of the Work. Unless agreed to by Owner in writing, such costs shall not exceed prevailing costs in the locality of the Project, shall exclude all of the costs itemized in Paragraph 11.01.B and shall include only the following:
1. payroll cost for persons under the direct employment of Contractor who are performing the Work under schedules of job classifications agreed to by Owner and Contractor. Included in such employees are superintendents, foremen and other full time employed personnel performing the Work. For employees who are not employed full time on the Work, payroll costs shall be allotted based on the time they spend on the Work. Included in payroll costs shall be, but not limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave and vacation and holiday pay. To the extent authorized by Owner, any overtime expenses accumulated due to performing Work outside of regular working hours on Saturday, Sunday or legal holidays shall be included in the above.
 2. cost of all equipment and materials Contractor furnishes and incorporates into the Work, including any costs associated with the transportation and storage of such materials and any field service cost of Supplier in connection with materials. Contractor shall accrue all cash discounts except when Owner deposits funds with Contractor (Owner will accrue cash discounts in this case), which Contractor uses to make payments. Owner shall accrue all trade discounts, rebates, refunds and returns from sale of surplus materials and equipment. It is the responsibility of the Contractor to make provisions so that trade discounts, rebates, refunds and returns from sale of surplus materials and equipment may be obtained.
 3. all payments made to Subcontractors by Contractor for the performance of Work by Subcontractors. Owner may require Contractor to obtain competitive bids from subcontractors and deliver such bids to Owner for acceptance. If a subcontract established that payment of Subcontractor will be based on Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined as provided in this Paragraph 11.01.
 4. cost associated with the employment of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys and accountants) for any services that specifically relate to the Work.
 5. Supplemental costs shall include the following:
 - a. expenses incurred in the discharge of duties connected with the Work by Contractor's employees due to necessary transportation, travel and subsistence.

- b. cost associated with the transportation and maintenance of all materials, supplies, equipment, machinery, appliances, and office and temporary facilities at the site. Cost of any hand tools, not owned by workers, which are consumed through the performance of the Work and cost, less market value, of items that remain the property of Contractor.
- c. cost accrued due to the rental of all construction equipment and machinery and costs associated with transportation, loading, unloading, assembly, dismantling and removal of such, whether rented from Contractor or others in accordance with a rental agreement that is approved by Owner. Said rental agreements will provide all requirements for such cost. At the time that such equipment, machinery or parts are no longer mandatory for the execution of the Work the rental of such shall conclude.
- d. taxes related to the Work such as sales, consumer, use and other similar taxes imposed by Laws and Regulations for which Contractor is liable.
- e. lost deposits that occur for causes other than negligence by Contractor, Subcontractor or anyone directly or indirectly employed by any of them or anyone whose acts they may be liable for. All royalty payments and fees for permits and licenses required for the performance of the Work.
- f. losses and damages related to the performance of the Work sustained by Contractor that are caused by damage to the Work and are not compensated by insurance or otherwise, provided the losses and damages occurred for reasons other than the negligence of Contractor, Subcontractor or anyone directly or indirectly employed by any of them or anyone whose acts they may be liable for. Such losses shall include settlements made with the written consent and approval of Owner. Cost of the Work will not include such losses, damages and expenses for the determination of Contractor's fee.
- g. cost of utilities, fuel and sanitary facilities at the Site.
- h. any minor expenses related to the performance of the Work such as telegrams, long distance telephone calls, telephone service at the Site, express and courier services and similar petty cash items.
- i. cost of premiums for all bonds and insurance the Contract Documents require Contractor to purchase and maintain.

B. *Costs Excluded:* None of the following items will be included in the term Cost of the Work:

- 1. cost resulting from payroll and other compensation of Contractor's officers, executives, principals, general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks and other personnel employed by Contractor, whether at the Site or in

Contractor's principal or branch office, for the general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.01.A.1 or specifically covered by Paragraph 11.01.A.4.

2. expenses incurred by Contractor's principal and branch offices excluding Contractor's office at the Site.
 3. all of Contractor's capital expenses including interest on Contractor's capital employed for the Work and charges due to delinquent payments against Contractor.
 4. cost incurred as the result of negligence including but not limited to the correction of defective Work, disposal of materials or equipment mistakenly supplied and repairing any property damaged by Contractor, Subcontractor or anyone directly or indirectly employed by any of them or anyone for whose acts they may be liable.
 5. other overhead or general expense cost of any kind and costs of any item not specifically and expressly included in Paragraphs 11.01.A.
- C. *Contractor's Fee:* Contractor's fee shall be determined as described in the Agreement when all of the Work is performed on the basis of cost-plus. Contractor's fee shall be determined as required by Paragraph 12.01.C whenever the value of any Work, that is the subject of a Change Order or an adjustment in Contract Price due to a Claim, is determined on the basis of Cost of the Work.
- D. *Documentation:* Contractor shall establish and maintain records in accordance with generally accepted accounting practices whenever the Cost of the Work, for any purpose, is to be determined based on Paragraphs 11.01.A and 11.01.B. Contractor shall submit all such records in itemized breakdown form together with supporting data to Owner.

11.02 Allowances

- A. It is understood that all allowances named in the Contract Documents have been included in the Contract Price by Contractor and all Work shall be performed for such sums and by such persons or entities that are acceptable to Owner and Engineer.
- B. *Cash Allowances:*
1. Contractor agrees that:
 - a. cost to Contractor for materials and equipment required by allowances to be delivered at the Site and all applicable taxes are included in the cash allowances; and
 - b. Contract Price includes Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit and other expenses contemplated for the cash allowances and not in the allowances, and Contractor's demand or request for additional payment of account such will be invalid.

C. *Contingency Allowance:*

1. A contingency allowance is for the sole use of Owner to cover unanticipated costs and is agreed upon by Contractor.
- D. A Change Order will be issued by Engineer that will reflect actual amounts owed to Contractor for the performance of Work covered by allowance prior to final payment and Contract Price will be adjusted accordingly.

11.03 *Unit Price Work*

- A. The Contract Price will be an amount equal to the sum of the unit price, for each item shown in Unit Price Work, times the approximate quantity of each item as shown in the Agreement wherever the Contract Documents show that the Work, either all or part, is to be Unit Price Work.
- B. The quantities of items of Unit Price Work are estimates and are for the sole purpose of comparisons of Bids and establishing an initial Contract Price. Engineer will determine the actual quantities and classifications of Unit Price Work that Contractor performs in accordance with Paragraph 9.07.
- C. Each unit price will be in an amount that Contractor considers being sufficient to cover overhead and profit for each identified item.
- D. A Claim for an adjustment in the Contract Price may be made in accordance with Paragraph 10.05 if:
1. a difference in the material or a significant difference from the estimated quantity, shown in the Agreement, occurs for any item of Unit Price Work performed by Contractor,
 2. no corresponding adjustment to any other item of Work occurs; and
 3. Contractor believes the Contract Price should be increased to account for additional expenses sustained by Contractor or Owner believes a decrease in Contract Price is justifiable and an amount of increase or decrease is unable to be agreed upon.

ARTICLE 12 – CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 *Change of Contract Price*

- A. A Change Order is required for a change to the Contract Price. The party making Claim must submit written notice to Engineer for any Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05.
- B. For any Work covered by a Change Order or any Claim for an adjusted Contract Price, the value will be determined as follows:

1. where unit prices for such Work are shown in the Contract Documents, by application of such unit prices to the quantities of the items involved in accordance with Paragraph 11.03; or
 2. where unit prices for such Work are not shown in the Contract Documents, by a sum agreed upon by both parties; or
 3. where unit prices for such Work are not shown in the Contract Documents and an agreement between parties cannot be reached under Paragraph 12.01.B.2, based on the Cost of the Work (determined in accordance with Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined in accordance with Paragraph 12.01.C).
- C. *Contractor's Fee:* The fee for overhead and profit for Contractor shall be determined as follows:
1. a mutually acceptable fixed fee; or
 2. in the instance an agreement on a fixed fee cannot be reached, then a fee established by the following percentages of different portions of the Cost of the Work:
 - a. Contractor's fee shall be fifteen percent for costs sustained under Paragraphs 11.01.A.1 and 11.01.A.2;
 - b. Contractor's fee shall be five percent for costs sustained under Paragraph 11.01.A.3;
 - c. where one or more tiers of subcontracts are based on Cost of the Work plus a fee and an agreement on a fixed fee cannot be reached, Paragraphs 12.01.C.2.a and 12.01.C.2.b intend for the Subcontractor who essentially performs the work to be paid a fee of fifteen percent of costs sustained by said Subcontractor in accordance with Paragraph 11.01.A.1 and 11.01.A.2 and that any Subcontractor or Contractor on a higher tier will each receive a fee of five percent of the amount paid to the next lower tier Subcontractor.
 - d. no fee shall be owed on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5 and 11.01.B;
 - e. the quantity of credit permitted by Contractor to Owner for any change that results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and
 - f. the modification in Contractor's fee shall be calculated on the basis of the net change in accordance with Paragraph 12.01.C.2.a through 12.01.C.2.e whenever additions and credits are associated with one change.

12.02 *Change of Contract Times*

- A. A Change Order is required to change the Contract Times. The party making the Claim must submit written notice to Engineer for any Claim for an adjustment in the Contract Times in accordance with Paragraph 10.05.
- B. The provisions of Article 12 will be used for the determination of any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times.

12.03 *Delays*

- A. Contract Times will be extended any amount equal to the time lost for any Work that Contractor is prevented from completing because of a delay beyond the control of Contractor provided a Claim is made as provided in Paragraph 12.02.A. Delays that are considered outside of the control of Contractor include but are not limited to acts or neglect by Owner or utility owners or other contractors performing other work as described by Article 7, fires, floods, epidemics, abnormal weather conditions or acts of God.
- B. Contractor shall be entitled to a reasonable adjustment in the Contract Price or Contract Times if delays, disruptions or interference with the performance of the Work occur due to Owner or other contractors or utility owners performing other work for Owner as described in Article 7. An adjustment of the Contract Times is based on said adjustment being critical to Contractor's ability to execute the Work within the Contract Times.
- C. If the performance of the Work by Contractor is delayed due to fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes that are not the responsibility of and beyond control of Owner and Contractor, then a reasonable adjustment in Contract Times will be permitted to Contractor but only if such adjustment is required for the completion of the Work within the Contract Times. Said adjustment shall be the sole and exclusive remedy for delays, described in this Paragraph 12.03.C, sustained by Contractor.
- D. Any claims, costs, losses or damages sustained by Contractor on or in connection with any project or expected project will not be the liability of Owner, Engineer or Owner's officers, directors, members, partners, employees, agents, consultants or subcontractors.
- E. For delays within the control of Contractor, no adjustment in Contract Price or Contract Times will be entitled to Contractor. Delays caused to and within the control of a Subcontractor or Supplier shall be considered delays within the control of Contractor.

ARTICLE 13 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.01 *Notice of Defects*

- A. Engineer will promptly notify Contractor of all defective Work that Owner or Engineer has

actual knowledge of. Defective Work may be rejected, corrected or accepted as provided in this Article 13.

13.02 *Access to Work*

- A. The Site and the Work will be accessible at reasonable times for observation, inspection and testing to Owner, Engineer, Owner's representatives and personnel, independent testing laboratories and governmental agencies with jurisdictional interests. It is the responsibility of the Contractor to advise them of Contractor's safety procedures and programs and provide them proper and safe conditions at the Site.

13.03 *Tests and Inspections*

- A. Engineer shall be notified in a timely manner of the readiness of the Work for all required inspections, tests or approvals. In order to facilitate required inspections or tests, Contractor shall cooperate with all inspection and testing personnel.
- B. Contractor shall be responsible for employing and paying for the services of an independent testing laboratory to perform all inspections, tests or approvals required by the Contract Documents except;
 - 1. for inspections, tests or approvals covered by Paragraphs 13.03.C and 13.03.D below;
 - 2. that costs incurred related to tests or inspections conducted with regards to Paragraph 13.04.B shall be paid in accordance to Paragraph 13.04.C; and
 - 3. as otherwise specifically provided in the Contract Documents.
- C. Contractor is obligated for arranging and obtaining inspections, tests or approvals and pay all cost in connection with any Laws or Regulations, with jurisdiction, that require any Work to be specifically inspected, tested or approved by an employee or representative of such public body. All such required certificates of inspection or approval shall be delivered to Engineer by Contractor.
- D. It is the responsibility of Contractor to arrange, obtain and pay all costs associated with inspections, tests or approvals required for Owner's and Engineer's approval of materials or equipment for incorporation into the Work; or acceptance of materials, mix designs or equipment submitted for approval prior to purchase by Contractor for incorporation into the Work. Owner and Engineer must approve of organization that performs such inspections, tests or approvals.
- E. Contractor shall uncover any Work, at Engineer's request, that is to be inspected, tested or approved that has been covered by Contractor without written agreement of Engineer.
- F. Contractor shall bear all expenses related to uncovering Work as provided in Paragraph 13.03.E except if Engineer has been notified by Contractor of the intent to cover Work and Engineer did not promptly respond to such notice.

13.04 *Uncovering Work*

- A. Contractor, at own expense, shall uncover any Work that was covered in disregard to written request of Engineer, if Engineer requests such Work to be uncovered.
- B. If it is deemed necessary or advisable by Engineer for covered Work to be observed by Engineer or inspected or tested by others, Contractor, at request of Engineer, shall uncover, expose or make available for observation, inspection or testing as required by Engineer the area of Work in question. Labor, material and equipment for the uncovering of such Work shall be provided by Contractor.
- C. Contractor shall pay all claims, costs, losses and damages occurring as a result of uncovering, exposure, observation, inspection, testing and satisfactory replacement or reconstruction of any uncovered Work that is found to be defective and a suitable decrease in the Contract Price shall be permitted for Owner.
- D. Contractor shall be entitled to an increase in the Contract Price or an extension of the Contract Times, or both, for any uncovering, exposure, observation, inspection, testing, replacement and reconstruction resulting from uncovering Work that is not found to be defective.

13.05 *Engineer May Stop the Work*

- A. Engineer may direct Contractor to cease the Work, if the Work is discovered to be defective due to failure to provide adequately skilled workers or appropriate materials or equipment or the Work was performed in a way that results in the completed Work being incompatible with the Contract Documents, until Contractor eliminates the cause for such order. The right of Engineer to cease the Work shall not require Engineer to implement this right for the benefit of Contractor, Subcontractor, Supplier, other individual or entity or any employee or agent of any of them.

13.06 *Correction or Removal of Defective Work*

- A. Contractor shall correct all defective Work, promptly after receipt of written notice, whether or not fabricated, installed or completed; if Engineer rejects any of the Work, Contractor shall remove it from the Project and replace it with Work that is acceptable. All claims, costs, losses and damages that are consequential to the correction or removal of defective Work shall be paid for by Contractor.
- B. Contractor shall not act in a way that would void or otherwise impair Owner's special warranty and guarantee while correcting defective Work as required by this Paragraph 13.06 or Paragraph 13.07.

13.07 *Correction Period*

- A. If any Work or any repair of damages to land or areas made accessible for Contractor's use by Owner or permitted by Laws and Regulations, as anticipated in Paragraph 6.11.A is found to be

defective within one year after the date of Substantial Completion or by any specific provision of the Contract Documents, without cost to Owner and in agreement with Owner's written instructions, Contractor shall:

1. restore such defective land or areas; or
 2. correct such defective Work; or
 3. remove any defective Work that has been rejected by Owner and replace it with Work that is not defective; and
 4. correct, repair or remove and replace any damage to other Work, to the work of others or other land or areas damaged as a result.
- B. Owner may have defective Work corrected or repaired or have rejected Work removed and replaced if Contractor fails to punctually fulfill the terms of Owner's written instructions or in the case of an emergency where any deferral would cause risk of loss or damage. Contractor shall pay all claims, costs, losses and damages that result from such correction or repair or removal and replacement.
- C. The correction period for any specific item of equipment that is put into continuous service prior to Substantial Completion of all the Work may begin to run from an earlier date if provided for in the Specifications.
- D. The correction period for the correction or removal and replacement, under this Paragraph 13.07, of defective Work shall be lengthened for an additional one year starting at a time after such correction or removal and replacement has been satisfactorily completed.
- E. The requirements of Contractor under this Paragraph 13.07 are in addition to any other requirement or warranty. The provisions of this Paragraph 13.07 shall not be interpreted as a substitute for or a waiver of the provisions of any relevant statute of limitation or repose.

13.08 Acceptance of Defective Work

- A. Owner may accept defective Work rather than require correction or removal and replacement. It is the responsibility of Contractor to pay all claims, costs, losses and damages attributable to Owner's and Engineer's assessment of and decision to accept such defective Work and for the reduced value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If Owner accepts defective Work, the required revisions in the Contract Documents will be completed with the issuance of a Change Order, and Owner shall be eligible for an appropriate reduction in the Contract Price that accounts for the reduced value of the accepted Work.

13.09 Owner May Correct Defective Work

- A. If defective Work is neither corrected nor removed and replaced by Contractor within a reasonable time after written notice from Engineer, or if performance of the Work by Contractor

is not in accordance with the Contract Documents, or if compliance with any provision of the Contract Documents is not made by Contractor, Owner has the right to correct or remedy any such deficiency after seven days written notice to Contractor.

- B. Owner shall proceed expeditiously with the rights and remedies provided by this Paragraph 13.09. Owner may dismiss Contractor from the Site, take control of all or part of the Work and discontinue Contractor's performance of the Work, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site and incorporate into the Work all materials and equipment stored at the site that Owner has paid Contractor but which are stockpiled in a different place, in conjunction with corrective or remedial action. Owner, Engineer, Owner's and Engineer's representatives, agents and employees and Owner's other contractors shall be permitted admission to the Site by Contractor to exercise the rights and remedies provided by this Paragraph.
- C. Contractor will be charged with all claims, costs, losses and damages incurred or sustained by Owner in the exercise of the rights and remedies provided by this Paragraph 13.09 and the required revisions in the Contract Documents will be completed with the issuance of a Change Order; and Owner shall be eligible for an appropriate reduction in the Contract Price. Such claims, costs, losses and damages will comprise of but will not be limited to all costs associated with repair or replacement of work of others that is destroyed or damaged by correction, removal or replacement of Contractor's defective Work.
- D. An extension of the Contract Times will not be granted to Contractor for any delay in the performance of the Work that results due to the exercise by Owner of Owner's rights and remedies under this Paragraph 13.09.

ARTICLE 14 – PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 Schedule of Values

- A. The basis for progress payments is established by the Schedule of Values, as provided in Paragraph 2.07.A, and will be integrated into a form of Application for Payment that is satisfactory to Engineer.

14.02 Progress Payments

- A. *Applications for Payments:*
 - 1. An Application for Payment shall be submitted to Engineer for evaluation at a minimum of twenty days prior to date established in the Agreement for each progress payment. The Application for Payment shall be signed and completed by Contractor and shall account for all accomplished Work as of the date of the Application and the documentation required by the Contract Documents shall accompany the Application. If Contractor request payment for materials and equipment that have not yet been integrated into the Work but have been transported and stockpiled at the Site or another location, a bill of sale, invoice or other document that demonstrates materials and equipment have been received by Owner free and clear of all Liens and evidence that the stored materials

and equipment have the applicable insurance coverage or other arrangement to protect Owner's interest, all of which must be acceptable to Owner, shall supplement the Application for Payment.

2. Each Application, beginning with the second Application for Payment, shall contain an affidavit of Contractor that states that all preceding progress payments have been used on account to release Contractor's responsibilities connected with preceding Applications for Payment.
3. The Agreement will establish the extent of retainage with respect to progress payments.

B. *Review of Applications:*

1. Engineer shall specify in writing either acceptance of payment or return Application to Contractor indicating Engineer's justification for refusal of payment within ten days after receipt of each Application for Payment. Contractor may make required corrections and resubmit Application if Engineer refuses original Application.
2. Engineer's acceptance of any payment requested in an Application for Payment will be founded on Engineer's inspection of the completed Work and on Engineer's evaluation of the Application for Payment and the associated data and schedules, that to the best of Engineer's knowledge, information and belief:
 - a. the Work has advanced to the point specified;
 - b. the quality of the Work conforms to the requirements of the Contract Documents (conditional to an assessment of the Work as an operational whole preceding or upon Substantial Completion, the results of any ensuing tests required by the Contract Documents, a final judgment of quantities and classifications for Unit Price Work under Paragraph 9.07); and
 - c. Contractor has satisfied all circumstances required for the Work that precede payment of Contractor
3. Engineer's evaluation of Contractor's Work for the determination of payment will not constitute responsibility on Engineer for:
 - a. supervision, direction or control of the Work; or
 - b. the means, methods, techniques, sequences or procedures of construction or the safety precautions and programs required for the performance of the Work; or
 - c. failure of Contractor to abide by Laws and Regulations pertinent to Contractor's performance of the Work; or
 - d. examination to determine how or for what purposes Contractor has used the moneys paid on account of the Contract Price; or

- e. determination that title to any of the Work, materials or equipment has progressed to Owner free and clear of any Liens.
- 4. Engineer may reject the whole or any part of any payment due to subsequently discovered evidence or as a result of subsequent inspections or tests to protect Owner from loss because:
 - a. the Work is defective or previously completed Work has been damaged and requires correction or replacement;
 - b. Change Orders have reduced the Contract Price;
 - c. Owner has corrected defective Work or finished Work in accordance with Paragraph 13.09; or
 - d. Owner has knowledge of the occurrence of any of the events shown in Paragraph 15.02.A.

C. *Payment Becomes Due:*

- 1. The amount settled on in the Application for Payment will be owed thirty days after the agreement on the amount due for that progress period and will be paid by Owner to Contractor.

D. *Reduction in Payment:*

- 1. Owner may withhold full payment as a result of:
 - a. claims made against Owner as a result of Contractor's performance or furnishing of the Work;
 - b. Liens filed in relation to the Work, not including when Contractor has provided a bond to specifically secure the satisfaction and discharge of such Liens;
 - c. other items warranting Owner to a set-off against the proposed amount; or
 - d. Owner's knowledge of the existence of any of the events described in Paragraph 15.02.A.
- 2. Owner will promptly provide Contractor written notice for any refusal to make payment of the full or partial amount in the Application for Payment. Written notice will outline the reasons for nonpayment. After Contractor corrects the reasons outlined in such written notice, Owner shall promptly compensate Contractor the amount withheld or any adjustment agreed to by Owner and Contractor.
- 3. If Owner's refusal of payment is discovered to be unwarranted, the amount unjustly

withheld shall be treated in accordance with Paragraph 14.02.C.1 and subject to interest as provided in the Agreement.

14.03 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials and equipment included in any Application for Payment, whether or not integrated into the Project, will pass to Owner free and clear of all Liens prior to the time of payment.

14.04 *Substantial Completion*

- A. Contractor shall advise Engineer in writing when Contractor deems the entire Work ready for its proposed use (excluding items specifically noted by Contractor as unfinished) and request Engineer release a certificate of Substantial Completion.
- B. Owner, Engineer and Contractor shall perform an inspection of the Work to determine the status of completion soon after Contractor's request for a certificate of Substantial Completion. Engineer will advise Contractor in writing of any reasons Engineer believes is preventing the Work from being substantially complete.
- C. Engineer shall execute and deliver a definitive certificate of Substantial Completion, fixing the date of Substantial Completion, when Engineer deems the Work substantially complete. Engineer shall attach a tentative list of items to be completed or corrected prior to final payment.
- D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities, pending final payment, between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees.
- E. After the date of Substantial Completion, Owner shall have the right to dismiss Contractor from the Site with the exception of allowing Contractor reasonable admission to remove Contractor's property and complete or correct items on the tentative list.

14.05 *Partial Utilization*

- A. Owner may use or occupy any substantially completed part of the Work which has explicitly been identified in the Contract Documents or which Engineer and Contractor agree is an independently operational and usable part of the Work. Contractor's performance of the Work must not be inhibited due to Owner's use or occupancy of such Work. Owner's use or occupancy of such Work is subject to the following conditions:
 - 1. If in the judgment of Engineer any part of the Work is ready for its proposed use and substantially complete, Engineer may request in writing for Contractor to allow Owner to use or occupy such Work. The procedures of Paragraph 14.04.A through E will be followed by Owner and Contractor if and when Contractor agrees that such part of the Work is substantially complete.

2. Contractor may request Engineer to issue a certificate of Substantial Completion at any time Contractor believes any such part of the Work is ready for its intended use and substantially complete by informing Owner and Engineer in writing of such conditions.
3. Owner, Engineer and Contractor shall make an inspection of that part of the Work to determine its status of completion within a reasonable amount of time after such request. Engineer will notify Contractor in writing if Owner or Engineer does not consider that part of the Work substantially complete and reasoning will be provided in the written notification. The provisions of Paragraph 14.04 will pertain with respect to certification of Substantial Completion of that part of the Work if Engineer deems that part of the Work to be substantially complete.
4. Use or occupancy or separate operation of part of the Work shall not take place preceding compliance with the requirements of Paragraph 5.10 regarding property insurance.

14.06 *Final Inspection*

- A. Owner, Engineer and Contractor will make a final inspection following written notice from Contractor that the entire Work or an agreed upon portion is complete. Contractor will be furnished with notification in writing from Engineer of all specifics revealed during the inspection signifying the Work is incomplete or defective. Incomplete or defective Work shall promptly be remedied by Contractor.

14.07 *Final Payment*

A. *Application for Payment:*

1. After the amendments identified in the final inspection have been rectified and completed, in the opinion of Engineer, by Contractor and Contractor has delivered, as required by Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, marked-up record documents and other documents, an application for final payment may be made by Contractor.
2. Contractor shall include with the final Application for Payment (except as formerly delivered):
 - a. all documentation required by the Contract Documents, along with but not limited to the proof of insurance required by Paragraph 5.05.B.6;
 - b. approval of the surety, if any, to final payment;
 - c. a list of all Claims, unresolved in the opinion of Contractor, against Owner; and
 - d. complete and legally effective releases or waivers (acceptable to Owner) of all Lien rights arising out of or Liens filed in association with the Work.

3. In lieu of the releases or waivers of Liens identified in Paragraph 14.07.A.2 and as permitted by Owner, Contractor may provide receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts containing all labor, services, material and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills and other indebtedness related to the Work that could become the obligation of Owner, or which could result in liens or other burdens on Owner's property, have been paid or otherwise fulfilled. Contractor may furnish a bond or other collateral that is acceptable to Owner to indemnify Owner against any Lien that may result due to any Subcontractor or Supplier's failure to provide such a release or receipt in full.

B. *Engineer's Review of Application and Acceptance:*

1. If Owner and Engineer are satisfied that the Work has been finished and Contractor's other responsibilities under the Contract Documents have been satisfied, based on observations by Engineer of the Work throughout construction and final inspection and Engineer's examination of the final Application for Payment and complementary documentation in accordance with the Contract Documents, Engineer, within ten days after receiving final Application for Payment, will provide Contractor with written notice that the Work is acceptable in accordance with Paragraph 14.09. Otherwise, Engineer will send the Application for Payment to Contractor and specify in writing Engineer's reason for rejection of final Application for Payment. In this case Contractor shall resubmit the Application for Payment after fulfilling the required amendments.

C. *Payment Becomes Due:*

1. The amount owed Contractor, less any amount Owner is entitled to, will become due and will be paid by Owner to Contractor thirty days after the Owner is given the final Application for Payment and associated documentation.

14.08 *Final Completion Delayed*

- A. If final fulfillment of the Work is considerably delayed and Contractor is not responsible for the delay, Owner shall make payment of the balance due for the portion of Work fully completed and accepted upon receipt of Contractor's final Application for Payment without terminating the Contract. Contractor shall submit the written consent of the surety for the payment of the balance due for the portion of the Work completed and accepted to Owner with the Application for such payment if the remaining balance retained by Owner for unfinished or erroneous Work is less than the retainage specified in the Agreement. Such payment shall be made by Owner in accordance with the terms and conditions governing final payment except that it shall not constitute a waiver of Claims.

14.09 *Waiver of Claims*

- A. The making and acceptance of final payment will constitute:
 1. Owner waiving all Claims against Contractor, other than all Claims resulting from

unsettled Liens, due to defective Work emerging after final inspection in accordance with Paragraph 14.06, due to failure in compliance with the Contract Documents or any specified terms of any special guarantees included in Contract Documents or due to remaining requirements of Contractor under the Contract Documents; and

2. Contractor waiving all Claims against Owner except any previously made Claims conforming with the requirements herein and specifically recognized in writing by Owner as still being unresolved.

ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION

15.01 Owner May Suspend Work

- A. Owner may interrupt the Work or any section of the Work, at any time and without reason, by informing Contractor in writing. Owner will establish the date Contractor may proceed with the Work and suspension of Work may not exceed ninety successive days. An adjustment in the Contract Price or an extension of the Contract Times shall be allowed to Contractor if a Claim is made by Contractor in accordance with Paragraph 10.05.

15.02 Owner May Terminate for Cause

- A. If any one or more of the following occurrences transpire, termination for cause will be justified:
 1. continuous failure by Contractor in the performance of the Work as required by the Contract Documents (including, but not limited to, failure to furnish adequately skilled workers or appropriate materials or equipment or failure to comply to the Progress Schedule established under Paragraph 2.07 as modified from time to time in accordance with Paragraph 6.04);
 2. disregard by Contractor of Laws or Regulations of any public body with jurisdiction;
 3. continual disregard by Contractor of the authority of Engineer; or
 4. violation by Contractor of any requirements of the Contract Documents in any significant way.
- B. If one or more of the occurrences described in Paragraph 15.02.A transpire, after giving Contractor seven days written notice of its intent to discontinue the services of Contractor, Owner may:
 1. without liability to Contractor for trespass or conversion, dismiss Contractor from the Site and seize possession of the Work and Contractor's tools, appliances, construction equipment and machinery at the Site and use to the full amount that they may possibly be used by Contractor.
 2. integrate into the Work all materials and equipment stockpiled at the site or for which Owner has compensated Contractor but may be stocked in another place; and

3. execute the Work as Owner may consider appropriate.
- C. Contractor shall not be eligible to accept any additional payment until the Work is concluded if Owner proceeds as specified in Paragraph 15.02.B. If the unpaid balance of the Contract Price exceeds all claims, costs, losses and damages sustained by Owner resulting from finishing the Work, such excess will be paid to Contractor. If such claims, costs, losses and damages exceed the unpaid balance, Contractor shall pay the difference to Owner. Owner shall not be obligated to acquire the lowest price for the performance of the Work when utilizing any rights or remedies under this Paragraph.
- D. Despite Paragraphs 15.02.B and 15.02.C, if Contractor commences, within seven days of receipt of notice of intent to terminate, to remedy Contractor's failure to execute and progresses diligently to rectify such failure within thirty days of receipt of said notice, Contractor's services will not be terminated.
- E. The termination of Contractor's services by Owner will not affect any rights or remedies existing or which may later accumulate of Owner against Contractor. Liability of Contractor will not be released as a consequence of any retention or payment of moneys due to Contractor by Owner.
- F. If and to the degree that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination process of that bond shall override the provisions of Paragraphs 15.02.B and 15.02.C.

15.03 *Owner May Terminate For Convenience*

- A. Owner may, without cause and prejudice to any other right or remedy of Owner, terminate the Contract after seven days written notice to Contractor. In such an event, Contractor shall be paid for:
 1. Work that was accomplished and accepted preceding the effective date of termination and executed as required by Contract Documents, including fair and equitable sums for overhead and profit on such Work;
 2. costs incurred preceding the effective date of termination in the performance of services and supplying labor, materials, or equipment in accordance with the Contract Documents related to unfinished Work, plus fair and reasonable sums for overhead and profit on such expenses;
 3. all claims, costs, losses, and damages sustained during the settlement of terminated contracts with Subcontractors, Suppliers, and others; and
 4. equitable expenses directly resulting from the termination.
- B. Projected profits or revenue or other economic loss subsequent to such termination shall not be paid to Contractor.

15.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (i) the Work is postponed by Owner or under an order of court or other public authority for more than ninety consecutive days, or (ii) Owner fails to respond to any Application for Payment within thirty days after submission, or (iii) Owner fails for thirty days to pay Contractor any sum determined to be due, then Contractor may, after seven days written notice to Owner and if Owner does not provide a solution to such failure within such times, terminate the Contract and recoup payment from Owner on the terms provided in Paragraph 15.03.
- B. Instead of terminating the Contract and without prejudice to any other right or remedy, if Owner has failed to respond to Application for Payment within thirty days of submission or failed to pay Contractor a sum that has been determined to be due within thirty days, Contractor may, seven days after written notice to Owner, cease all Work pending all payments, including any accrued interest, owed to Contractor by Owner. The intent of Paragraph 15.04 is not to prevent Contractor from making a Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or any expenses or damages consequential to Contractor's discontinuance of Work as allowed by this Paragraph.

ARTICLE 16 – DISPUTE RESOLUTION

16.01 *Methods and Procedures*

- A. Mediation of any Claim made under Paragraph 10.05 may be requested by Owner or Contractor preceding a final and binding verdict. Such mediation will be overseen by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.
- B. Owner and Contractor shall engage in the mediation process in good faith. The process shall be completed by sixty days of the filing of the request. The date of termination of the mediation shall be decided by application of the mediation rules indicated above.
- C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraph 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:
 - 1. elect in writing to invoke any dispute resolution process provided for in the Supplementary Conditions; or
 - 2. agree with the other party to submit the Claim to another dispute resolution process; or
 - 3. gives written notice to the other party of the intent to submit the Claim to a court of competent jurisdiction.

ARTICLE 17 – MISCELLANEOUS

17.01 *Giving Notice*

- A. Whenever written notice is required by the Contract Documents, it will be considered to have been properly executed if it is:
 - 1. given in person to either the individual, member of the firm or an officer of the corporation for whom it is intended; or
 - 2. delivered to or sent by registered or certified mail, postage prepaid to the latest business address known to the giver of the notice.

17.02 *Computation of Times*

- A. Whenever any period of time is expressed in days in the Contract Documents, it will be figured by excluding the first and including the last day of such period. If the last day of such period falls on a Saturday, Sunday or legal holiday, said day will be excluded from the calculation.

17.03 *Cumulative Remedies*

- A. The duties and obligations established by the General Conditions and the rights and remedies existing in the General Conditions to the parties are supplementary to and are not to be interpreted in any way as a limitation of, any rights and remedies applicable to any or all of them which are established or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents. 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 pertain.

17.04 *Survival of Obligations*

- A. All representations, indemnifications, warranties, and guarantees made in, mandated by, or given in accordance with the Contract Documents, as well as all ongoing responsibilities specified in the Contract Documents, will continue beyond final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

17.05 *Controlling Law*

- A. This Contract is to be governed by the State of Georgia.

17.06 *Headings*

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

END OF SECTION 00700

SECTION 00800 - SUPPLEMENTARY CONDITIONS

INDEX

PART 1: TERMS	2
PART 2: SCOPE OF THE WORK	2
PART 3: CONSTRUCTION DRAWINGS	2
PART 4: COMMENCEMENT AND COMPLETION OF WORK	2
PART 5: SUBSTITUTIONS OR "OR EQUAL"	2
PART 6: REPORTS AND DRAWINGS USED BY THE ENGINEER	3
PART 7: INSURANCE	3
PART 8: ADDITIONAL INSURED AND CERTIFICATES OF INSURANCE	5
PART 9: INSTALLATION FLOATER	6
PART 10: ACCIDENTS	6
PART 11: HOLD HARMLESS CLAUSE	6
PART 12: CONTRACTOR'S STATUS	6
PART 13: CONTRACTOR'S AFFIDAVIT	7
PART 14: RESIDENT PROJECT ENGINEER	7
PART 15: ACCESS FOR INSPECTION	7
PART 16: UTILITIES	7
PART 17: ADJUSTMENT OF DISCREPANCIES	7
PART 18: MEASUREMENT AND PAYMENT	7
PART 19: MODIFICATION OF QUANTITIES	7
PART 20: SAFETY AND HEALTH REGULATIONS	8
PART 21: SANITARY CONVENIENCES	8
PART 22: UTILITY SERVICES	8
PART 23: ENVIRONMENTAL IMPACT	8
PART 24: CONSTRUCTION STAKEOUT	9
PART 25: INSTRUCTION OF OWNER'S EMPLOYEES	9
PART 26: RECORD DATA AND DRAWINGS	10
PART 27: PROPERTY CORNERS	10
PART 28: RESTORATION	10
PART 29: MAINTENANCE DURING CONSTRUCTION	10
PART 30: BARRICADES, DANGER, WARNING AND DETOUR SIGNS	11
PART 31: HIGH VOLTAGE ACT	11
PART 32: BUY AMERICAN	11

PART 1: TERMS

- 1.1 The terms used in this Supplementary Conditions have been defined in the General Conditions and will be interpreted according to the definition given to them in the General Conditions.

PART 2: SCOPE OF THE WORK

- 2.1 See Section 000100 and 012000 for descriptions of the scope of work.

Installation of approximately 144 L.F. of 36" reinforced concrete pipe (RCP) for nine (9) culvert crossings, nine (9) RCP flared end sections with trash racks, 270 S.Y. of type 3 riprap, and associated grading and erosion and sedimentation control. The time allotted for final completion of work is **90 consecutive calendar days**.

PART 3: CONSTRUCTION DRAWINGS

- 3.1 The Work shall conform to the following construction drawings:

**City of Warner Robins:
Gas Easement Remediation
Cover and Sheets C-1 thru C-14**

PART 4: COMMENCEMENTS AND COMPLETION OF WORK

- 4.1 Contractor shall begin work within ten (10) days once the Notice to Proceed has been issued. Contractor's work shall be complete within **90 consecutive calendar days** from the Notice to Proceed.
- 4.2 If Contractor is unable to execute the work with enough persistence to ensure each portion of the work is accomplished within the time shown on the above schedule, in addition to any extensions created in conformance with Article 12 of the General Conditions; and, if Owner does not implement his reservations as provided for in Article 13, Contractor shall proceed with the work in which case liquidated damages for the delay will be unattainable. If applicable, liquidated damages will be required of the Contractor in the amount of **\$500 per each day** of delay of the work until the work is completed.

PART 5: SUBSTITUTIONS OR "OR EQUAL"

- 5.1 Substitutes for the major equipment manufacturers shown in the Technical Specifications may be used. Submittals on "Or Equal" substitutes must be provided, within forty-eight (48) hours after the Bid Opening, to Engineer.
- A. Submittals for every proposed type of equipment shall contain 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 essential for Engineer to conclude if the required Specifications will be satisfied.

- B. The price bid of the substitute equipment shall not be used in the calculation of the base bid but shall be bid as a deductible or additive alternate and shown on the forms supplied in the Proposal.
- C. A five (5) year warranty shall be mandatory on all substitute equipment/materials/systems in the form of a bond or other equivalent surety, except when allowed by the Engineer. Such warranty/surety shall be equal to the total amount of the Contractor's purchase order and shall account for installation and service for the substitute. Owner can demand adjustment or replacement if the substitute fails to operate adequately in regards to mechanical integrity or performance. Owner can also apply any or all of the bond/surety to adjust or replace the system or segments of the system, including alterations to another process, if the supplier/manufacturer fails to rectify the defects/performance.
- D. The action and performance of the substitute supplier/manufacturer shall be the liability of Contractor pending acceptable performance and afterward during the one (1) year warranty period as stated in the Contract Documents. After this, to cover the remaining period of four (4) years, Owner can take action on the system supplier's bond/surety. The bond/surety must be tendered preceding acceptance of the substitute.
- E. Engineer reserves the right to accept or reject any and all substitutes suggested by Contractor.
- F. Award of the contract will be based on the lowest qualified base bid including any substitutes chosen by Engineer.
- G. The cost of all re-design and cost of all structural, mechanical and electrical changes shall be contained in the adjustment of the price bid for the substitute equipment if Engineer establishes that the considered item will not conform to the design.

PART 6: REPORTS AND DRAWINGS USED BY THE ENGINEER

6.1 Engineer has utilized the following for the development of the Drawings and Specifications:

- A. The subsequent reports of explorations and tests of sub-surface conditions at the site of the Work:
 - 1. N/A
- B. The subsequent drawings of physical conditions in or pertaining to existing surface and sub-surface structures, excluding Underground Facilities, which are adjacent to the site of the Work:
 - 1. N/A

PART 7: INSURANCE

7.1 The limits of liability for the insurance required by Paragraph 5.04 of the General Conditions shall supply coverage at minimum equal to the following amounts or exceeding where mandated by Laws and Regulations:

A. Workers' Compensation and Employer's Liability etc. under Paragraphs 5.04.A.1 and 5.04.A.2 of the General Conditions:

- | | | |
|----|---|--|
| 1. | Workers Compensation | Statutory Limit |
| 2. | Employer's Liability | \$500,000 Each Accident for Bodily Injury by Accident
\$500,000 Each Employee for Bodily Injury by Disease
\$500,000 Aggregate for Injury by Disease |
| 3. | Waiver of Subrogation applies in favor of Owner | |

B. Comprehensive General Liability (under Paragraphs 5.04.A.3 through 5.04.A.5 of the General Conditions):

- | | | |
|----|--|-------------|
| 1. | Each Occurrence Limit (Bodily Injury and Property Damage) | \$1,000,000 |
| | General Aggregate, Per Project | \$2,000,000 |
| | Ongoing Products and Completed Operations Aggregate | \$2,000,000 |
| | Personal and Advertising Injury Limit | \$1,000,000 |
| 2. | Property Damage liability insurance will furnish Explosion, Collapse and Underground coverages where relevant. | |
| 3. | Excess/Umbrella Policy | |
| | General Aggregate | \$5,000,000 |
| | Each Occurrence | \$5,000,000 |
| 4. | The Owner requires that Contractor names Owner as an additional insured on Contractor's General Liability insurance policy as evidenced by attaching form CG 20 10 07 04 and CG 20 37 07 04. Limits will apply on a per project basis for this additional insured. | |

C. Business or Commercial Automobile Liability (under Paragraph 5.04.A.6 of the General Conditions):

- | | | |
|----|------------------------------------|-------------|
| 1. | Combined Single Limit per Accident | \$1,000,000 |
|----|------------------------------------|-------------|

7.2 Installation Floater:

For contract amounts less than \$500,000: N/A

For contract amounts \$500,000 or greater: 100% of the materials cost

7.3 Contractual Endorsement:

A. In accordance with Paragraph 5.04.B.3 of the General Conditions, the Contractual Liability shall furnish coverage equal to or greater than the following amounts:

- | | |
|---------------------|------------------|
| 1. Bodily Injury: | |
| \$500,000 | Each Occurrence |
| 2. Property Damage: | |
| \$100,000 | Each Occurrence |
| \$N/A | Annual Aggregate |

PART 8: ADDITIONAL INSURED AND CERTIFICATES OF INSURANCE

8.1 Certificates satisfactory to Owner shall accompany the signed Contract Documents when they are transmitted to the Owner for execution.

8.2 Owner shall be listed as Additional Insured on the Contractor's General Liability Policy and Builder's Risk in equivalent amounts required by the Contractor in addition to the requirements of Paragraph 5.3 to the General Conditions. The Owner, along with their respective officers, agents and employees, shall be named as additional insureds for Ongoing Operations and Products/Completed Operations on the Contractor's and any Subcontractor's Commercial General Liability Policy, which must be primary and noncontributory with respect to the additional insureds. This insurance shall remain in effect as set forth below, in the "Continuation of Coverage" provision.

It is expressly understood by the parties to this Contract that it is the intent of the parties that any insurance obtained by the Owner is deemed excess, non-contributory and not co-primary in relation to the coverage(s) procured by the Contractor or any of their respective consultants, officers, agents, subcontractors, employees or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of the aforementioned may be liable by operation of statute, government regulation or applicable case law.

To the fullest extent permitted by applicable state law, a Waiver of Subrogation Clause shall be added to the General Liability, Automobile and Workers Compensation policies in favor of Owner, and this clause shall apply to the Owner's officers, agents and employees, with respect to all projects during the policy term.

Prior to commencement of work, Contractor shall submit a Certificate of Insurance in favor of Owner and an Additional Insured Endorsement on ISO Forms CG 20 10 (07/04) and CG 20 37 (07/04) (or substitute forms providing equivalent coverage) as required hereunder.

The Aggregate Limit shall apply per project. The Certificate shall provide for thirty (30) days'

written notice to Owner for cancellation or any change in coverage. Copies of insurance policies shall promptly be made available to the Owner upon request.

PART 9: INSTALLATION FLOATER

- 9.1 If required by parameters in Section 7.2, an Installation Floater shall be obtained and sustained through the life of the Contract Agreement by Contractor to protect the interests of the Owner, Contractor and Sub-Contractors against loss by fire, vandalism, malicious mischief and all hazards contained in a standard "All Risk" Coverage endorsement. The amount of such insurance shall at all times be equivalent to or exceeding the total materials cost for the complete project. The policies shall be in the name of the Owner and Contractor.

PART 10: ACCIDENTS

- 10.1 Contractor shall furnish, at the site, medical equipment and facilities that will adequately provide first-aid service to anyone who could become injured in association with the work. All accidents resulting in death, personal injury or property damage resulting from or in connection with the performance of the Work shall be disclosed to Owner and Engineer in writing, including full details and statement of witnesses, by Contractor whether accident occurs on or adjacent to the site. Additionally, if death or serious injuries or damages result from accident, the accident shall be immediately reported by telephone or messenger to Contractor and any subcontractor on account of any accident. Contractor shall promptly report the full details of the facts in writing to Owner and Engineer. Contractor shall inform his superintendent, foreman, or whoever is present at the site of the work the name and phone number of the hospital and the name and phone number of the doctor he intends to use in the event of an accident.

PART 11: HOLD HARMLESS CLAUSE

- 11.1 Contractor agrees to hold harmless, indemnify and defend Owner and Owner's agents, architects, engineers and employees from and against any and all claims, losses, damages, demands, causes of action and any and all associated costs and expenses, of every kind and character, emerging out of, incidental to, or resulting directly or indirectly from the Contractor's performance of the work described in this contract, regardless if such loss, damage, injury or liability is furthered by the negligence of the Owner, Engineer, its agents, architects, engineers or employees, except that Contractor shall have no liability for damages or the costs incidental to such caused by the sole negligence of the Owner, Engineer, its agents, architects, engineers or employees. Any and all Subcontractors will be obligated by Contractor to comply with the requirements of this clause preceding any work and agrees to guarantee that this clause is in conformity with the insurance provisions of the contract.

PART 12: CONTRACTOR'S STATUS

- 12.1 It is established that Contractor shall maintain the status of an Independent Contractor and the employees of Contractor are not employees of the Owner.

PART 13: CONTRACTOR'S AFFIDAVIT

- 13.1 After finishing the work and preceding final payment and settlement of all sums due in accordance with the contract, Contractor will submit to Owner, a Contractor's Affidavit in the typical form submitted by Contractor under the laws of the State of Georgia declaring that all bills for labor, materials and services in conjunction with said contract have been paid in full, recognizing receipt of the contract price and affirming that there are not unsettled claims under said contract which could become a lien on the real estate emerging out of said contract.

PART 14: RESIDENT PROJECT ENGINEER

- 14.1 If considered essential, Owner upholds the right to furnish a Resident Project Engineer to ensure the quality control of the Project and the conformance of the Work to the Plans and Specifications. Resident Project Engineer will act as Owner's Representative on the Project and will have the authority of the Owner as set forth in the Contract Documents.

PART 15: ACCESS FOR INSPECTION

- 15.1 Contract shall provide access for representatives of the Georgia Department of Natural Resources, Environmental Protection Division and the Georgia Department of Highways and Public Transportation for inspection of the site.

PART 16: UTILITIES

- 16.1 Utilities such as sewer, water and electric lines encountered during the work shall be preserved from damage and retained in service pending the relocation or replacement as mandated by this Contract or by others as the case may be, or abandoned as might be essential for the appropriate construction and use of the new work.

PART 17: ADJUSTMENT OF DISCREPANCIES

- 17.1 In any instance of inconsistencies among the dimensions and details presented by drawings or between the drawings and these specifications, the more costly construction shall be estimated preceding construction and the issue shall be presented to the Engineer for explanation. Without such a judgment, the inconsistencies shall be modified by the Contractor at his own risk and Contractor shall bear all additional costs incurred due to the resolution of complications from such modification.

PART 18: MEASUREMENT AND PAYMENT

- 18.1 Measurement and payment shall be rendered for the units presented on the Bid Schedule and at the lump sum contract prices shown on the Bid Schedule. Direct payment shall only be rendered for those items or work specifically shown in the proposal. Cost incurred due to any additional work must be encompassed in the contract price for the appropriate items to which it is associated.

PART 19: MODIFICATION OF QUANTITIES

- 19.1 The itemized quantities shall be deemed the quantities essential for the accomplishment of the Work by Contractor for the determination of the bid. In any instance that the quantities necessary for the construction of the work are greater or less than the quantities displayed on the items, an amount equal to the difference in quantities will be added or deducted from the contract price at the unit prices for

such item.

- 19.2 If itemized quantities are not identified in the Proposal, the work displayed on the plans or indicated shall be believed by the Contractor to be incorporated in his contract for the lump sum price bid.

PART 20: SAFETY AND HEALTH REGULATIONS

- 20.1 Contractor shall conform with the Department of Labor Safety and Health Regulations for Construction declared 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 controlled by the Department of Labor and admission to the project by Department of Labor Safety and Health shall be permitted by Contractor.

PART 21: SANITARY CONVENIENCES

- 21.1 Satisfactory sanitary conveniences shall be furnished by Contractor for use by anyone employed for the work and their use shall be rigorously enforced. Such accommodations shall be accessible at the time the first employees reach the site and shall be withdrawn following the exit of the last employees from the site.

PART 22: UTILITY SERVICES

- 22.1 Water and electrical service will be determined by and at the expense of the Contractor.

PART 23: ENVIRONMENTAL IMPACT

- 23.1 All activities by the Contractor shall be organized to reduce, to the utmost degree achievable, any unfavorable environmental impact.
- A. Noise: All equipment and machinery shall be equipped with exhaust mufflers that are maintained in good working order to result in minimized operational noise.
 - B. Dust/Smoke: All equipment activities shall be characterized by a minimum of dust. Traveled surfaces and earthwork shall be kept in a moist condition to minimize the creation of dust or the airborne migration of particulate material under all prevalent atmospheric conditions.
 - C. Traffic: Trucks shall be moved along roads in such a way that minimizes the influence on traffic and annoyance to the public. All material shall be loaded in a way which will prevent the loss of any part of the load during transport.
 - D. Sedimentation: All locations of intense runoff due to rainfall shall be visually examined to verify that no material eroded from the construction site is being transferred offsite. If such transfer is transpiring, actions, including the establishment of detention basins, shall rapidly be employed to abolish such transfer. Soil Erosion and sediment control efforts shall contain all temporary and permanent techniques of protection and trapping soils of the construction site throughout land disturbing actions. Activity incorporated in this contract is exempt from the Georgia Erosion and Sediment Control Act, and NPDES General Permit for Construction Activity.

PART 24: CONSTRUCTION STAKEOUT

- 24.1 Construction stakeout shall be the obligation of the Contractor.
- 24.2 Contractor shall execute the layout of the work by following the dimensions and benchmarks presented on the plans and shall be accountable for all measurements that could be essential during the performance of the work prescribed in the specifications or on the Drawings, conditional to such adjustments which might be necessary to accommodate altered conditions or resulting from required revisions to the Work.
- 24.3 All stakes, spikes, steel pins, templates, platforms, equipment, instruments, tools and materials and all labor mandatory for laying out any portion of the Work from baselines and benchmarks shall be supplied by and at the expense of the Contractor.
- 24.4 Contractor shall be accountable for maintaining and preserving all benchmarks displayed on the plans.
- 24.5 All survey records shall be documented in conformance with standard and approved methods. All field notes, sketches, records and computations generated by the Contractor in the lay out of the work shall be accessible for analysis by the Engineer or his duly approved representative at all times throughout the execution of the work.
- 24.6 Such surveys and computations shall be performed by Contractor as needed for the determination of the amount of work accomplished or placed throughout each period for which a progress payment is to be prepared.
- 24.7 The Engineer is authorized to perform checks as the work proceeds to verify lines and grades identified by the Contractor and to confirm the completed work is in compliance with the specifications of the Contract Documents and Drawings. Such examination by the Engineer or Engineer's representative shall not dismiss the obligation of the Contractor to complete all work in conformance with the Contract Documents and Drawings and the lines and grades specified within them. If the location marks identified by the Contractor are confirmed to be inaccurate or inadequate, work shall be postponed until amendments have been made to the erroneous location marks.
- 24.8 No distinct payment will be made to Contractor for costs associated with the survey work, layout work or staking. All such costs will be deemed incidental to the Work.

PART 25: INSTRUCTION OF OWNER'S EMPLOYEES

- 25.1 Contractor shall furnish capable personnel who thoroughly comprehend the operation of the equipment to inform the Owner's employees of the operation and maintenance of each item and system. Such training shall occur at a time or times suitable to Owner and preceding acceptance of the installation by the Owner. The Contractor's bid price for this Contract shall contain cost incurred due to this training. Training shall be of the on-the-job type and shall contain all operation and equipment maintenance.
- 25.2 Arrangements for the training of Owner's employees will be jointly established by Owner and Contractor.

PART 26: RECORD DATA AND DRAWINGS

- 26.1 Contractor shall employ the services of Professional Land Surveyor registered in the State of Georgia to survey the final locations and elevations of the new infrastructure. Record drawings shall be sealed and signed by the Professional Land Surveyor and should include the following: all street names, right-of-way widths, easements, lot numbers and addresses, location/material/size of all sanitary sewer and drinking water infrastructure, manhole locations/rim elevations/invert elevations, valve locations, fire hydrant locations, fitting locations, water meter locations, benchmark information. "RECORD DRAWINGS" shall be printed in bold on the final documents provided to the Owner. Contractor shall provide Owner with two (2) hard copies of the record drawings and a thumb drive containing the record drawings in .DWG and .PDF format along with a .TXT file containing coordinates for the points surveyed.

PART 27: PROPERTY CORNERS

- 27.1 Any property corners or monuments disturbed by Contractor during the performance of the work shall be restored by a professional surveyor registered in the State of Georgia at the expense of the Contractor.

PART 28: RESTORATION

- 28.1 Contractor shall manage his operations in a way that repairs roadways, driveways, curb and gutter, ditches and easements as the pipe laying advances.
- 28.2 Reasonable care shall be taken by Contractor throughout the performance of the work to prevent damage to vegetation. When applicable, ornamental shrubbery and tree branches shall be restrained in such a way to decrease possible damage. Trees sustaining damage to branches shall have damaged branches pruned in such a way to enhance the appearance of the tree. Tree trunks sustaining damage during the performance of the work shall have tree dressing administered to the damaged areas.

PART 29: MAINTENANCE DURING CONSTRUCTION

- 29.1 Work shall be maintained by Contractor from the start of construction operations until final acceptance. Such maintenance shall incorporate continuous and effective work conducted day by day with satisfactory equipment and require that the site and structures at the project are retained in acceptable condition at all times, in addition to acceptable signing or marking as applicable and control of traffic wherever necessary by use of traffic control devices as mandated by the State of Georgia.
- 29.2 Contractor shall extract all construction signs and barriers after the conclusion of the Work.
- 29.3 Contractor shall keep roads accessible to traffic throughout the performance of the Work. Contractor shall maintain sections of the site accessed by public traffic in such a way to accommodate traffic. All cost incurred due to mandatory signs and markings and other maintenance work throughout construction and before the Work is accepted will be the responsibility of the Contractor. Contractor shall also endure the cost associated with maintenance of approaches, crossings, intersections and other features as may be needed.

PART 30: BARRICADES, DANGER, WARNING AND DETOUR SIGNS

- 30.1 All required barricades, lighting, danger signals, signs and other traffic control devices shall be provided, erected and maintained by Contractor. Contractor shall also take all applicable provisions to insure the protection of the work and the safety of the public. All highways and streets restricted from traffic shall be protected by adequate barricades and all obstructions shall be lighted at any time of darkness. Contractor shall furnish appropriate warning signs for the control and direction of traffic.
- 30.2 All mandatory barricades, warning signs and other protection devices shall be furnished, installed and maintained, in accordance with the State requirements, by Contractor. Temporary signs can be reused only if such signs are in acceptable condition and legible. All protective devices shall be maintained in good, legible condition throughout their use.
- 30.3 Temporary barricades and signs shall be removed as soon as the construction progresses to the point that such signs are no longer necessary.
- 30.4 The cost of furnishing, erecting, maintaining and removing protective devices will not be paid for as a distinct Bid Item. The cost incurred by Contractor due to the performance of these functions shall be incorporated into the overall Bid. Contractor shall maintain ownership of all temporary warning devices.

PART 31: HIGH VOLTAGE ACT

- 31.1 Contractor accepts the obligations of the High Voltage Act of the General Assembly of Georgia by execution of this Contract.

PART 32: BUY AMERICAN

- 32.1 By submitting this bid, Contractor guarantees that preference will be given to domestic construction material by the Contractor, sub-contractors, material men and suppliers during the performance of this Contract.

END OF SECTION 00800

**SECTION 011000
SUMMARY OF WORK**

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Contract description.
2. Work by Owner or other Work at the Site. (NOT USED)
3. Owner-furnished products. (NOT USED)
4. Work sequence.
5. Owner occupancy.
6. Permits.

1.2 CONTRACT DESCRIPTION

The work to be performed and provided under this Contract shall consist of furnishing all labor, materials, tools, equipment, safety equipment, permitting, erosion and sedimentation control measures, taxes, profit, overhead, and other costs and effort required to complete the following:

Installation of approximately 144 L.F. of 36" reinforced concrete pipe (RCP) for nine (9) culvert crossings, nine (9) RCP flared end sections with trash racks, 270 S.Y. of type 3 riprap, and associated grading and erosion and sedimentation control. The time allotted for final completion of work is **90 consecutive calendar days**.

- A. Perform Work of the Contract under fixed and unit cost contract with Owner according to General and Supplemental Conditions of Contract.
- B. Work of the Contract is identified in the following:
1. Plans, Specifications and contract documents

1.3 WORK BY OWNER OR OTHERS (NOT USED)

1.4 OWNER-FURNISHED PRODUCTS (NOT USED)

1.5 WORK SEQUENCE/SCHEDULE

- A. Contractor to coordinate and report work sequence and schedule with private property owners, Engineer and the City of Warner Robins.

1.6 PARTIAL OWNER OCCUPANCY

- A. The Owner may occupy existing facilities to which these improvements are being made and will continue operation during the period of construction.

- B. There shall not be any interruption in service that hasn't been approved by the Owner and Engineer. The Contractor is responsible for fines assessed due to his activities.
- C. Whenever, in the opinion of the Owner and Engineer, any section or portion of the work or any structure is in suitable condition, it may be put into use upon the written order of the Engineer and such usage will not be held in any way as an acceptance of said work, or any part thereof, or as a waiver of any of the provisions of these Specifications and the Contract. Pending final completion and acceptance of the Work, all necessary repairs and replacements, due to defective materials or workmanship or operations of the Contractor, for any section of the work so put into use shall be performed by the Contractor at Contractor's own expense.

1.7 PERMITS

- A. Furnish necessary permits for construction of Work including the following:
 - 1. NOI and Land Disturbance Permit as applicable

PART 2 - PRODUCTS – (NOT USED)

PART 3 - EXECUTION – (NOT USED)

END OF SECTION 011000

**SECTION 012000
PRICE AND PAYMENT PROCEDURES**

PART 1 - GENERAL

1. SECTION INCLUDES

- A. Cash allowances.
- B. Contingency allowances.
- C. Testing and inspection allowances.
- D. Schedule of Values.
- E. Application for Payment.
- F. Change procedures.
- G. Defect assessment.
- H. Unit prices.
- I. Alternates.

2. CONTINGENCY ALLOWANCES

- A. Included in the bid schedule is a stipulated sum/price of \$25,000 for use upon Owner's instruction as a contingency allowance and shall be utilized only with written pre-approval of OWNER.
- B. Contractor's costs for products, delivery, installation, labor, insurance, payroll, taxes, bonding, equipment rental, overhead, and profit will be included in Change Orders authorizing expenditure of funds from this contingency allowance.
- C. Funds will be drawn from contingency allowance only by Change Order.
- D. Payment for work completed using the allowance shall be based on negotiated, agreed, documented tasks requested by OWNER.
- E. At closeout of Contract, funds remaining in contingency allowance will be credited to Owner by Change Order.

3. SCHEDULE OF VALUES

- A. Submit schedule for Engineer review in Excel Format. Contractor's standard form or electronic media printout will be considered for this use. Type schedule on 8-1/2 x 11-inch white paper.
- B. Identify schedule with:

1. Title of Project and Location
2. Engineer
3. Name and address of Contractor
4. Contract designation
5. Date of Submission

- C. Submit Schedule of Values within 20 days after date of Owner-Contractor Agreement.
- D. Format: Each line item of the schedule on the bid schedule shall be used for the pay items in the schedule of values.
- E. Include in each line item amount of allowances as specified in this Section. For unit cost allowances, identify quantities taken from Contract Documents multiplied by unit cost to achieve total for each item.
- F. Revise schedule to list approved Change Orders with each Application for Payment.

4. APPLICATION FOR PAYMENT

- A. Submit schedule on a form of Application for Payment that is satisfactory to the Engineer.
- B. Content and Format: Use Schedule of Values for listing items in Application for Payment.
- C. Submit updated construction schedule with each Application for Payment.
- D. Payment Period: Submit at intervals stipulated in the Agreement.
- E. Submit submittals with transmittal letter as specified in Section 013300 - Submittal Procedures.
- F. Submit three copies of waivers requested by Owner.
- G. Substantiating Data: When Engineer requires substantiating information, submit data justifying dollar amounts in question. Include the following with Application for Payment:
 1. Current construction photographs specified in Section 013300 Submittal Procedures.
 2. Partial release of liens from major Subcontractors and vendors.
 3. Record Documents as specified in Section 017000 Execution and Closeout Requirement, for review by Owner, which will be returned to Contractor.
 4. Affidavits attesting to off-Site stored products.
 5. Construction Progress Schedule, revised and current as specified in Section 013300 Submittal Procedures.

5. CHANGE PROCEDURES

- A. Submittals: Submit name of individual who is authorized to receive change documents and is responsible for informing others in Contractor's employ or Subcontractors of changes to the Work.

- B. Carefully study and compare Contract Documents before proceeding with fabrication and installation of Work. Promptly advise Engineer of any error, inconsistency, omission, or apparent discrepancy.
- C. Requests for Interpretation (RFI) and Clarifications: Allot time in construction scheduling for liaison with Engineer; establish procedures for handling queries and clarifications.
 - 1. Submit Request for information on a form that is satisfactory to the Engineer.
 - 2. Engineer may respond with a direct answer on the Request for Interpretation form.
- D. Engineer will advise of minor changes in the Work not involving adjustment to Contract Sum/Price or Contract Time by issuing supplemental instructions.
- E. Engineer may issue Proposal Request including a detailed description of proposed change with supplementary or revised Drawings and Specifications, a change in Contract Time for executing the change with stipulation of overtime work required and with the period of time during which the requested price will be considered valid. Contractor will prepare and submit estimate within 5 days.
- F. Contractor may propose changes by submitting a request for change to Engineer, describing proposed change and its full effect on the Work. Include a statement describing reason for the change and the effect on Contract Sum/Price and Contract Time with full documentation and a statement describing effect on the Work by separate or other Contractors.
- G. Document requested substitutions according to Section 012500 - Substitution Procedures.
- H. Stipulated Sum/Price Change Order: Based on Notice of Change and Contractor's fixed price quotation or Contractor's request for Change Order as approved by Engineer.
- I. Unit Price Change Order: For Contract unit prices and quantities, the Change Order will be executed on a fixed unit price basis. For unit costs or quantities of units of that which are not predetermined, execute Work under Work Directive Change. Changes in Contract Sum/Price or Contract Time will be computed as specified for Time and Material Change Order.
- J. Work Directive Change: Engineer may issue directive, signed by Owner, instructing Contractor to proceed with change in the Work, for subsequent inclusion in a Change Order. Document will describe changes in the Work and designate method of determining any change in Contract Sum/Price or Contract Time. Promptly execute change.
- K. Time and Material Change Order: Submit itemized account and supporting data after completion of change, within time limits indicated in Conditions of the Contract. Engineer will determine change allowable in Contract Sum/Price and Contract Time as provided in Contract Documents.
- L. Maintain detailed records of Work done on time and material basis. Provide full information required for evaluation of proposed changes and to substantiate costs for changes in the Work.
- M. Document each quotation for change in Project Cost or Time with sufficient data to allow evaluation of quotation.
- N. Change Order Forms: Form approved for use by Engineer.

- O. Execution of Change Orders: Engineer will issue Change Orders for signatures of parties as provided in Conditions of the Contract.
- P. Correlation of Contractor Submittals:
 - 1. Promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as separate line item and adjust Contract Sum/Price.
 - 2. Promptly revise Progress Schedules to reflect change in Contract Time, revise subschedules to adjust times for other items of Work affected by the change, and resubmit.
 - 3. Promptly enter changes in Record Documents.

6. DEFECT ASSESSMENT

- A. Replace the Work, or portions of the Work, not conforming to specified requirements.
- B. If, in the opinion of Engineer, it is not practical to remove and replace the Work, Engineer will direct appropriate remedy or adjust payment.
- C. The defective Work may remain, but unit sum/price will be adjusted to new sum/price reduced 50 percent at discretion of Engineer.
- D. Defective Work will be partially repaired according to instructions of Engineer, and unit sum/price will be adjusted to new sum/price reduced 50 percent reduced at discretion of Engineer.
- E. Individual Specification Sections may modify these options or may identify specific formula or percentage sum/price reduction.
- F. Authority of Engineer to assess defects and identify payment adjustments is final.
- G. Nonpayment for Rejected Products: Payment will not be made for rejected products for any of the following reasons:
 - 1. Products wasted or disposed of in a manner that is not acceptable.
 - 2. Products determined as unacceptable before or after placement.
 - 3. Products not completely unloaded from transporting vehicle.
 - 4. Products placed beyond lines and levels of the required Work.
 - 5. Products remaining on hand after completion of the Work.
 - 6. Loading, hauling, and disposing of rejected products.

7. UNIT PRICES

- A. Authority: Measurement methods are delineated in individual Specification Sections.
- B. Measurement methods delineated in individual Specification Sections complement criteria of this Section. In event of conflict, requirements of individual Specification Section govern.
- C. Take measurements and compute quantities. Engineer will verify measurements and quantities.

- D. Unit Quantities: Quantities and measurements indicated on Bid Form are for Contract purposes only. Quantities and measurements supplied or placed in the Work shall determine payment. Actual quantities provided shall determine payment.
1. When actual Work requires more or fewer quantities than those quantities indicated, provide required quantities at contracted unit sum/prices.
 2. When actual Work requires 25 percent or greater change in quantity than those quantities indicated, Owner or Contractor may claim a Contract Price adjustment.
- E. Payment Includes: Full compensation for required labor, products, tools, equipment, plant and facilities, transportation, services and incidentals; erection, application, or installation of item of the Work; overhead and profit.
- F. Final payment for Work governed by unit prices will be made on basis of actual measurements and quantities accepted by Engineer multiplied by unit sum/price for Work incorporated in or made necessary by the Work.
- G. Measurement of Quantities:
1. Weigh Scales: Inspected, tested, and certified by applicable State weights and measures department within past year.
 2. Platform Scales: Of sufficient size and capacity to accommodate conveying vehicle.
 3. Metering Devices: Inspected, tested, and certified by applicable State department within past year.
 4. 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.
 5. Measurement by Volume: Measured by cubic dimension using mean length, width, and height or thickness.
 6. Measurement by Area: Measured by square dimension using mean length and width or radius.
 7. Linear Measurement: Measured by linear dimension, at item centerline or mean chord.
 8. Stipulated Sum/Price Measurement: Items measured by weight, volume, area, or linear means or combination, as appropriate, as completed item or unit of the Work.
- H. Unit Price Schedule:
1. Item: N/A; Section N/A.

8. ALTERNATES

- A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted Alternates will be identified in Owner-Contractor Agreement. The Owner-Contractor Agreement may identify certain Alternates to remain an Owner option for a stipulated period of time.
- B. Coordinate related Work and modify surrounding Work. Description for each Alternate is recognized to be abbreviated but requires that each change shall be complete for scope of Work affected.

1. Coordinate related requirements among Specification Sections as required.
2. Include as part of each Alternate: Miscellaneous devices, appurtenances, and similar items incidental to or necessary for complete installation.
3. Coordinate Alternate with adjacent Work and modify or adjust as necessary to ensure integration.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION

A. BASE BID PAY ITEMS

1. MOBILIZATION/DEMObILIZATION

- a. **Mobilization/Demobilization** - This item shall include all mobilization and demobilization necessary for construction of the storm drainage infrastructure and shall not exceed 5% of the total of the rest of the bid items. Mobilization shall include all labor, costs, materials, and expenses for mobilization and demobilization to the site, project performance indemnifications, photographs, videotaping, shop drawings, working drawings, schedules, red line record drawings and documents, coordination with the Owner and all other roadway and utility owners and operators, storage and staging areas, bonding, site restoration, and all other miscellaneous housekeeping and administrative items associated with, and necessary to, complete the Project. Payment shall be at the Contract lump sum price. Seventy-five (75) percent of the lump sum price shall be payable with the first pay request following deployment to the site and commencement of construction activities. The remaining twenty-five (25) percent shall be payable with the final payment including delivery and acceptance of redline drawings and closeout documents activity completion.

2. EARTHWORK

- a. **Grading Complete** – This item shall include all necessary labor, materials, and equipment to establish grades identified in the plans and specifications to ensure adequate cover over culverts and stabilize the roadbed. Payment shall be made upon completion of the Work.
- b. **200-LB Woven Fabric** - This item shall include all labor, equipment, materials, necessary for the installation of 200-LB woven fabric as shown and described in the project plans and technical specifications. Payment for rip rap installation shall be paid at the Contract unit price per square yard installed.
- c. **#4 Surge Stone** - This item shall include all labor, equipment, materials, necessary for the installation of #4 surge stone as shown and described in the project plans and technical specifications. Payment for rip rap installation shall be paid at the Contract unit price per square yard installed.

3. EROSION AND SEDIMENTATION CONTROL

- a. **Double Row Type “S” Silt Fence (Sd1-S)** – This item shall include all necessary preparation, installation, removal of accumulated silt, maintenance, and ultimate

removal of the silt fence as shown and described in the project plans and technical specifications. Payment shall be made at the Contract unit price per linear foot for each linear foot of Type "S" silt fence installed.

- b. **Construction Exit (Co)** – This item shall include all labor, equipment, materials, subgrade preparation, compaction, installation, maintenance and ultimate removal as detailed in the project plans and specifications. Payment shall be at the Contract unit price per each for each installed as detailed in the project plans and technical specifications.
- c. **Temporary Mulching (Ds1)** – This item shall include all labor, equipment, materials, installation, and maintenance until temporary grass is established. Payment shall be made at the Contract unit price per acre for each acre that is mulched following construction activities. No additional payment will be made to contractor for areas that are disturbed outside of the construction limits of the project.
- d. **Temporary Grassing (Ds2)** – This item shall include all labor, equipment, seed, fertilizer, lime, topsoiling and dust control, seedbed preparation, watering, mowing, reseeding as necessary, and otherwise maintaining until permanent grassing is established. Payment shall be made at the Contract unit price per acre for each acre that is temporarily grassed following construction activities. No additional payment will be made to contractor for areas that are disturbed outside of the construction limits of the project.
- e. **Permanent Grassing (Ds3)** – This item shall include all labor, equipment, seed, fertilizer, lime, seedbed preparation, watering, mowing, reseeding as necessary, and otherwise maintaining until a stand of grass is achieved and the NOT is filed. Payment shall be made at the Contract unit price per acre for each acre that is permanently grassed following construction activities. No additional payment will be made to contractor for areas that are disturbed outside of the construction limits of the project.
- f. **Erosion Blanket (Ss)** – This item shall include all labor, equipment, materials, subgrade preparation, installation, maintenance, and ultimate removal as detailed in the project plans and specifications. Payment shall be at the Contract unit price per square yard for each square yard installed as detailed in the project plans and technical specifications.

4. **WATER DISTRIBUTION INFRASTRUCTURE**

- a. **36" Class 3 RCP** - This item shall include all materials, labor, and equipment necessary for installation of 36" Class 3 RCP. Payment shall include all excavation, dewatering, bedding, pipe installation, backfill, compaction, clean-up, hauling, and all other required work for complete installation of the 36" Class 3 RCP as shown and described in the project plans and technical specifications. Payment shall be made at the Contract unit price per linear foot installed as measured along the centerline of the pipeline.
- b. **36" RCP Flared End Sections w/ Trash Rack** - This item shall include all materials, labor, and equipment necessary for installation of 36" Flare End Sections with Trash Racks. Payment shall include all excavation, dewatering, bedding, installation clean-up, hauling and all other required work for complete installation as shown and described in the project plans and technical specifications. Payment shall be made at the Contract unit price per each unit installed.

- c. **Type 3 Rip Rap** – This item shall include all labor, equipment, materials, necessary for the installation of rip rap and geofabric as shown and described in the project plans and technical specifications. Payment for rip rap installation shall be paid at the Contract unit price per square yard installed.

5. **ALLOWANCES**

- a. **Owner's Allowance** - This item shall only be authorized for use at the written discretion of the City. Under no circumstance shall the Contractor assume any allowance is available for use in the project unless authorized by the City for unknowns associated with construction activities.

END OF SECTION 012000

**SECTION 012500
SUBSTITUTION PROCEDURES**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Quality assurance.
- B. Product options.
- C. Product substitution procedures.

1.2 QUALITY ASSURANCE

- A. Contract is based on products and standards established in Contract Documents without consideration of proposed substitutions.
- B. Products specified define standard of quality, type, function, dimension, appearance, and performance required.
- C. Substitution Proposals: Permitted for specified products except where specified otherwise. Do not substitute products unless substitution has been accepted and approved in writing by Owner.

1.3 PRODUCT OPTIONS

- A. See Section 016000 - Product Requirements.

1.4 PRODUCT SUBSTITUTION PROCEDURES

- A. Engineer will consider requests for substitutions only within 48 hours of the bid opening.
- B. Substitutions may be considered when a product becomes unavailable through no fault of Contractor.
- C. Document each request with complete data, substantiating compliance of proposed substitution with Contract Documents, including:
 - 1. Manufacturer's name and address, product, trade name, model, or catalog number, performance and test data, and reference standards.
 - 2. Itemized point-by-point comparison of proposed substitution with specified product, listing variations in quality, performance, and other pertinent characteristics.
 - 3. Reference to Article and Paragraph numbers in Specification Section.
 - 4. Cost data comparing proposed substitution with specified product and amount of net change to Contract Sum.
 - 5. Changes required in other Work.
 - 6. Availability of maintenance service and source of replacement parts as applicable.
 - 7. Certified test data to show compliance with performance characteristics specified.

8. Samples when applicable or requested.
9. Other information as necessary to assist Engineer's evaluation.

D. A request constitutes a representation that Bidder:

1. Has investigated proposed product and determined that it meets or exceeds quality level of specified product.
2. Will provide same warranty for substitution as for specified product.
3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
4. Waives claims for additional costs or time extension that may subsequently become apparent.
5. Will coordinate installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects.
6. Will reimburse Owner Engineer for review or redesign services associated with reapproval by authorities having jurisdiction.

E. Substitutions will not be considered when they are indicated or implied on Shop Drawing or Product Data submittals without separate written request or when acceptance will require revision to Contract Documents.

F. Substitution Submittal Procedure:

- 1.
2. Submit three copies of Request for Substitution for consideration. Limit each request to one proposed substitution.
3. Submit Shop Drawings, Product Data, and certified test results attesting to proposed product equivalence. Burden of proof is on proposer.
4. Engineer will notify Contractor in writing of decision to accept or reject request.

1.5 INSTALLER SUBSTITUTION PROCEDURES

A. Engineer will consider requests for substitutions only within 48 hours of the bid opening.

B. Document each request with:

1. Installer's qualifications.
2. Installer's experience in work similar to that specified.
3. Other information as necessary to assist Engineer's evaluation.

C. Substitution Submittal Procedure:

1. Submit four copies of Request for Substitution for consideration. Limit each request to one proposed substitution.
2. Engineer will notify Contractor in writing of decision to accept or reject request.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 012500

SECTION 013000
ADMINISTRATIVE REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Coordination and Project conditions.
- B. Preconstruction meeting.
- C. Site mobilization meeting.
- D. Progress meetings.
- E. Preinstallation meetings.
- F. Closeout meeting.
- G. Alteration procedures.

1.2 COORDINATION AND PROJECT CONDITIONS

- A. Coordinate scheduling, submittals, and Work of various Sections of Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Verify that utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate Work of various Sections having interdependent responsibilities for installing, connecting to, and placing operating equipment in service.
- C. Coordinate space requirements, supports, and installation of mechanical and electrical Work indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit as closely as practical; place runs parallel with lines of building. Use spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
 - 1. Coordination Drawings: Prepare as required to coordinate all portions of Work. Show relationship and integration of different construction elements that require coordination during fabrication or installation to fit in space provided or to function as intended. Indicate locations where space is limited for installation and access and where sequencing and coordination of installations are important.
- D. Coordination Meetings: In addition to other meetings specified in this Section, hold coordination meetings with personnel and Subcontractors to ensure coordination of Work.
- E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within construction. Coordinate locations of fixtures and outlets with finish elements.

- F. Coordinate completion and clean-up of Work of separate Sections in preparation for Substantial Completion and for portions of Work designated for Owner's partial occupancy and for portions of Work designated for Owner's occupancy.
- G. After Owner's occupancy of premises, coordinate access to Site for correction of defective Work and Work not complying with Contract Documents, to minimize disruption of Owner's activities.

1.3 PRECONSTRUCTION MEETING

- A. Engineer will schedule and preside over meeting after Notice of Award.
- B. Attendance Required: Engineer, Owner, major Subcontractors, and Contractor.
- C. Minimum Agenda:
 - 1. Execution of Owner-Contractor Agreement.
 - 2. Submission of executed bonds and insurance certificates.
 - 3. Distribution of Contract Documents.
 - 4. Submission of list of Subcontractors, list of products, schedule of values, and Progress Schedule.
 - 5. Designation of personnel representing parties in Contract.
 - 6. Communication procedures.
 - 7. Procedures and processing of requests for interpretations, field decisions, field orders, submittals, substitutions, Applications for Payments, proposal request, Change Orders, and Contract closeout procedures.
 - 8. Scheduling.
 - 9. Critical Work sequencing.
 - 10. Scheduling activities of Geotechnical Engineer.
- D. Engineer: Record minutes and distribute copies to participants within five days after meeting, to Contractor, Owner, and those affected by decisions made.

1.4 SITE MOBILIZATION MEETING

- A. Engineer will schedule and preside over meeting at Project Site prior to Contractor occupancy.
- B. Attendance Required: Engineer, Owner, Contractor, Contractor's superintendent, special consultants and major Subcontractors.
- C. Minimum Agenda:
 - 1. Use of premises by Owner and Contractor.
 - 2. Owner's requirements and partial occupancy.
 - 3. Construction facilities and controls provided by Owner.
 - 4. Temporary utilities provided by Owner.
 - 5. Survey and building layout.
 - 6. Security and housekeeping procedures.
 - 7. Schedules.

8. Procedures for testing.
 9. Procedures for maintaining record documents.
 10. Requirements for startup of equipment.
 11. Inspection and acceptance of equipment put into service during construction period.
- D. Engineer: Record minutes and distribute copies to participants within five days after meeting, to Contractor, and those affected by decisions made.

1.5 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of the Work at maximum bi-monthly intervals.
- B. Engineer will make arrangements for meetings, prepare agenda with copies for participants, and preside over meetings.
- C. Attendance Required: Job superintendent, major Subcontractors, Contractors and suppliers, and Engineer, Owner, as appropriate to agenda topics for each meeting.
- D. Minimum Agenda:
1. Review minutes of previous meetings.
 2. Review of Work progress.
 3. Field observations, problems, and decisions.
 4. Identification of problems impeding planned progress.
 5. Review of submittal schedule and status of submittals.
 6. Review of off-Site fabrication and delivery schedules.
 7. Maintenance of Progress Schedule.
 8. Corrective measures to regain projected schedules.
 9. Planned progress during succeeding work period.
 10. Coordination of projected progress.
 11. Maintenance of quality and work standards.
 12. Effect of proposed changes on Progress Schedule and coordination.
 13. Other business relating to Work.
- E. Engineer: Record minutes and distribute copies to participants within five days after meeting, to Engineer, Owner, and those affected by decisions made.

1.6 PREINSTALLATION MEETINGS

- A. When required in individual Specification Sections, convene preinstallation meetings at Project Site before starting Work of specific Section.
- B. Require attendance of parties directly affecting, or affected by, Work of specific Section.
- C. Notify Engineer five days in advance of meeting date.
- D. Prepare agenda and preside over meeting:
1. Review conditions of installation, preparation, and installation procedures.

2. Review coordination with related Work.
- E. Engineer: Record minutes and distribute copies to participants within five days after meeting, to Engineer, Owner, and those affected by decisions made.

1.7 CLOSEOUT MEETING

- A. Schedule Project closeout meeting with sufficient time to prepare for requesting Substantial Completion. Preside over meeting and be responsible for minutes.
- B. Attendance Required: Contractor Construction Manager, major Contractors, major Subcontractors, Engineer, Owner, and others appropriate to agenda.
- C. Notify Engineer five days in advance of meeting date.
- D. Minimum Agenda:
 1. Start-up of facilities and systems.
 2. Operations and maintenance manuals.
 3. Testing, adjusting, and balancing.
 4. System demonstration and observation.
 5. Operation and maintenance instructions for Owner's personnel.
 6. Temporary indoor-air-quality plan and procedures.
 7. Contractor's inspection of Work.
 8. Contractor's preparation of an initial "punch list."
 9. Procedure to request Engineer inspection to determine date of Substantial Completion.
 10. Completion time for correcting deficiencies.
 11. Inspections by authorities having jurisdiction.
 12. Certificate of Occupancy and transfer of insurance responsibilities.
 13. Partial release of retainage.
 14. Final cleaning.
 15. Preparation for final inspection.
 16. Closeout Submittals:
 - a. Project record documents.
 - b. Operating and maintenance documents.
 - c. Operating and maintenance materials.
 - d. Affidavits.
 17. Final Application for Payment.
 18. Contractor's demobilization of Site.
 19. Maintenance.
- E. Engineer: Record minutes and distribute copies to participants within five days after meeting, to Engineer, Owner, and those affected by decisions made.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION

3.1 ALTERATION PROCEDURES

- A. Designated areas of existing facilities will be occupied for normal operations during progress of construction. Cooperate with Owner in scheduling operations to minimize conflict and to permit continuous usage.
 - 1. Perform Work not to interfere with operations of occupied areas.
 - 2. Keep utility and service outages to a minimum and perform only after written approval of Owner.
 - 3. Clean Owner-occupied areas daily. Clean spillage, overspray, and heavy collection of dust in Owner-occupied areas immediately.
- B. Materials: As specified in product Sections; match existing products with new and salvaged products for patching and extending Work.
- C. Employ skilled and experienced installer to perform alteration and renovation Work.
- D. Cut, move, or remove items as necessary for access to alterations and renovation Work. Replace and restore at completion. Comply with Section 017000 - Execution and Closeout Requirements
- E. Remove unsuitable material not marked for salvage, including rotted wood, corroded metals, and deteriorated masonry and concrete. Replace materials as specified for finished Work.
- F. Remove debris and abandoned items from area and from concealed spaces.
- G. Prepare surface and remove surface finishes to permit installation of new Work and finishes.
- H. Close openings in exterior surfaces to protect existing Work from weather and extremes of temperature and humidity.
- I. Remove, cut, and patch Work to minimize damage and to permit restoring products and finishes to original or specified condition.
- J. Refinish existing visible surfaces to remain in renovated rooms and spaces, to specified renewed condition for each material, with neat transition to adjacent finishes.
- K. Where new Work abuts or aligns with existing Work, provide smooth and even transition. Patch Work to match existing adjacent Work in texture and appearance.
- L. When finished surfaces are cut so that smooth transition with new Work is not possible, terminate existing surface along straight line at natural line of division and submit recommendation to Engineer for review.
- M. Where change of plane of 1/4 inch or more occurs, submit recommendation for providing smooth transition to Engineer for review request instructions from Engineer.

- N. Trim existing doors to clear new floor finish. Refinish trim to original or specified condition.
- O. Patch or replace portions of existing surfaces that are damaged, lifted, discolored, or showing other imperfections.
- P. Finish surfaces as specified in individual product Sections.

END OF SECTION 013000

**SECTION 013216
CONSTRUCTION PROGRESS SCHEDULE**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Submittals.
- B. Quality assurance.
- C. Format for network analysis schedules.
- D. Network analysis schedules.
- E. Bar chart schedules.
- F. Review and evaluation.
- G. Updating schedules.
- H. Distribution.

1.2 SUBMITTALS

- A. Within (10) calendar days after the Notice to Proceed, submit proposed preliminary network diagram defining planned operations for all project task.
- B. Participate in review of preliminary and complete network diagrams jointly with Engineer.
- C. Within (20) days after joint review of proposed preliminary network diagram, submit draft of proposed complete network diagram for review. Include written certification that major Subcontractors have reviewed and accepted proposed schedule.
- D. Within (10) days after joint review, submit complete network analysis consisting of network diagrams and mathematical analyses.
- E. Submit updated network schedules with each Application for Payment.
- F. Submit number of opaque reproductions Contractor requires, plus two copies Engineer will retain.
- G. Submit network schedules under transmittal letter form specified in Section 013300 - Submittal Procedures.
- H. Schedule Updates:
 - 1. Overall percent complete, projected and actual.
 - 2. Completion progress by listed activity and sub activity, to within five working days prior to submittal.

3. Changes in Work scope and activities modified since submittal.
4. Delays in submittals or resubmittals, deliveries, or Work.
5. Adjusted or modified sequences of Work.
6. Other identifiable changes.
7. Revised projections of progress and completion.

I. Narrative Progress Report:

1. Submit with each submission of Progress Schedule.
2. Summary of Work completed during the past period between reports.
3. Work planned during the next period.
4. Explanation of differences between summary of Work completed and Work planned in previously submitted report.
5. Current and anticipated delaying factors and estimated impact on other activities and completion milestones.
6. Corrective action taken or proposed.

1.3 QUALITY ASSURANCE

- A. Scheduler: Contractor's personnel specializing in CPM scheduling with two years' minimum experience in scheduling construction work of complexity comparable to the Project, and having use of computer facilities capable of delivering detailed graphic printout within 48 hours of request.
- B. Contractor's Administrative Personnel: Two years' minimum experience in using and monitoring CPM schedules on comparable Projects.

1.4 FORMAT FOR NETWORK ANALYSIS SCHEDULE

- A. Listings: Reading from left to right, in ascending order for each activity. Identify each activity with applicable Specification Section number.
- B. Diagram Sheet Size: 11 inches high x 17 inches wide required.
- C. Scale and Spacing: To allow for notations and revisions.

1.5 NETWORK ANALYSIS SCHEDULES

- A. Prepare network analysis diagrams and supporting mathematical analyses using critical path method.
- B. Illustrate order and interdependence of activities and sequence of Work; how start of given activity depends on completion of preceding activities, and how completion of activity may restrain start of subsequent activities.
- C. Illustrate complete sequence of construction by activity, identifying Work of separate stages. Indicate dates for submittals and return of submittals; dates for procurement and delivery of critical products; and dates for installation and provision for testing. Include legend for symbols and abbreviations used.

- D. Mathematical Analysis: Tabulate each activity of detailed network diagrams using calendar dates, and identify for each activity:
1. Preceding and following event numbers.
 2. Activity description.
 3. Estimated duration of activity, in maximum 15-day intervals. Status of critical activities.
 4. Earliest start date.
 5. Earliest finish date.
 6. Actual start date.
 7. Actual finish date.
 8. Latest start date.
 9. Latest finish date.
 10. Total and free float; accrue float time to Owner and to Owner's benefit.
 11. Monetary value of activity, keyed to Schedule of Values.
 12. Percentage of activity completed.
 13. Responsibility.
- E. Analysis Program: Capable of compiling monetary value of completed and partially completed activities, of accepting revised completion dates, and of recomputing of scheduled dates and float.
- F. Required Sorts: List activities in sorts or groups:
1. By preceding Work item or event number from lowest to highest.
 2. By longest float, then in order of early start.
 3. By responsibility in order of earliest possible start date.
 4. In order of latest allowable start dates.
 5. In order of latest allowable finish dates.
 6. Contractor's periodic payment request sorted by Schedule of Values list.
 7. List of basic input data-generating report.
 8. List of activities on critical path.
- G. Prepare subschedules for each stage of Work and Sequencing of Construction Plan identified in Section 011000 - Summary.
- H. Coordinate contents with Schedule of Values in Section 013300 - Submittal Procedures.

1.6 BAR CHART SCHEDULES

- A. Format: Bar chart Schedule, to include at least:
1. Identification and listing in chronological order of those activities reasonably required to complete the Work, including:
 - a. Subcontract Work.
 - b. Major equipment design, fabrication, factory testing, and delivery dates including required lead times.
 - c. Move-in and other preliminary activities.
 - d. Equipment and equipment system test and startup activities.
 - e. Project closeout and cleanup.
 - f. Work sequences, constraints, and milestones.

2. Listings identified by Specification Section number.
3. Identification of the following:
 - a. Horizontal time frame by year, month, and week.
 - b. Duration, early start, and completion for each activity and subactivity.
 - c. Critical activities and Project float.
 - d. Subschedules to further define critical portions of Work.

1.7 REVIEW AND EVALUATION

- A. Participate in joint review and evaluation of schedules with Engineer at each submittal.
- B. Evaluate Project status to determine Work behind schedule and Work ahead of schedule.
- C. After review, revise schedules incorporating results of review, and resubmit within 5 days.

1.8 UPDATING SCHEDULES

- A. Maintain schedules to record actual start and finish dates of completed activities.
- B. Indicate progress of each activity to date of revision, with projected completion date of each activity. Update schedules to depict current status of Work.
- C. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.
- D. Upon approval of a Change Order, include the change in the next schedule submittal.
- E. Indicate changes required to maintain Date of Substantial and Total Completion.
- F. Submit sorts as required to support recommended changes.
- G. Prepare narrative report to define problem areas, anticipated delays, and impact on schedule. Report corrective action taken or proposed and its effect including effects of changes on schedules of separate Contractors.

1.9 DISTRIBUTION

- A. Following joint review, distribute copies of updated schedules to Contractor's Project site file, to Subcontractors, suppliers, Engineer, Owner, and other concerned parties.
- B. Instruct recipients to promptly report, in writing, problems anticipated by projections shown in schedules.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 013216

**SECTION 013300
SUBMITTAL PROCEDURES**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Definitions.
- B. Submittal procedures.
- C. Construction progress schedules.
- D. Proposed product list.
- E. Product data.
- F. Use of electronic CAD files of Project Drawings.
- G. Shop Drawings.
- H. Samples.
- I. Other submittals.
- J. Design data.
- K. Test reports.
- L. Certificates.
- M. Manufacturer's instructions.
- N. Manufacturer's field reports.
- O. Erection Drawings.
- P. Construction photographs.
- Q. Contractor review.
- R. Engineer review.

1.2 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Engineer's responsive action.

- B. Informational Submittals: Written and graphic information and physical Samples that do not require Engineer's responsive action. Submittals may be rejected for not complying with requirements.

1.3 SUBMITTAL PROCEDURES

- A. Transmit each submittal with - Submittal Transmittal Engineer-accepted form.
- B. Sequentially number transmittal forms. Mark revised submittals with original number and sequential alphabetic suffix.
- C. Identify: Project, Contractor, Subcontractor and supplier, pertinent Drawing and detail number, and Specification Section number appropriate to submittal.
- 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 according to requirements of the Work and Contract Documents.
- E. Schedule submittals to expedite Project, and deliver to Engineer at business address. Coordinate submission of related items.
- F. For each submittal for review, allow 15 days excluding delivery time to and from Contractor.
- G. Identify variations in Contract Documents and product or system limitations that may be detrimental to successful performance of completed Work.
- H. Allow space on submittals for Contractor and Engineer review stamps.
- I. When revised for resubmission, identify changes made since previous submission.
- J. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report inability to comply with requirements.
- K. Submittals not requested will not be recognized nor processed.
- L. Incomplete Submittals: Engineer will not review. Complete submittals for each item are required. Delays resulting from incomplete submittals are not the responsibility of Engineer.

1.4 CONSTRUCTION PROGRESS SCHEDULES

- A. Comply with Section 013216 - Construction Progress Schedule

1.5 PROPOSED PRODUCT LIST

- A. Within 15 days after date of Notice to Proceed, submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
- B. For products specified only by reference standards, indicate manufacturer, trade name, model or catalog designation, and reference standards.

1.6 PRODUCT DATA

- A. Product Data: Action Submittal: Submit to Engineer for review for assessing conformance with information given and design concept expressed in Contract Documents.
- B. Submit number of copies Contractor requires, plus four copies Engineer will retain.
- 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, produce copies and distribute according to "Submittal Procedures" Article and for record documents described in Section 017000 - Execution and Closeout Requirements.

1.7 ELECTRONIC CAD FILES OF PROJECT DRAWINGS

- A. Electronic CAD Files of Project Drawings: May only be used to expedite production of Shop Drawings for the Project. Use for other Projects or purposes is not allowed.
- B. Electronic CAD Files of Project Drawings: Distributed only under the following conditions:
 - 1. Use of files is solely at receiver's risk. Engineer does not warrant accuracy of files. Receiving files in electronic form does not relieve receiver of responsibilities for measurements, dimensions, and quantities set forth in Contract Documents. In the event of ambiguity, discrepancy, or conflict between information on electronic media and that in Contract Documents, notify Engineer of discrepancy and use information in hard-copy Drawings and Specifications.
 - 2. CAD files do not necessarily represent the latest Contract Documents, existing conditions, and as-built conditions. Receiver is responsible for determining and complying with these conditions and for incorporating addenda and modifications.
 - 3. User is responsible for removing information not normally provided on Shop Drawings and removing references to Contract Documents. Shop Drawings submitted with information associated with other trades or with references to Contract Documents will not be reviewed and will be immediately returned.
 - 4. Receiver shall not hold Engineer responsible for data or file clean-up required to make files usable, nor for error or malfunction in translation, interpretation, or use of this electronic information.
 - 5. Receiver shall understand that even though Engineer has computer virus scanning software to detect presence of computer viruses, there is no guarantee that computer viruses are not present in files or in electronic media.
 - 6. Receiver shall not hold Engineer responsible for such viruses or their consequences, and shall hold Engineer harmless against costs, losses, or damage caused by presence of computer virus in files or media.

1.8 SHOP DRAWINGS

- A. Shop Drawings: Action Submittal: Submit to Engineer for assessing conformance with information given and design concept expressed in Contract Documents.

- B. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- C. When required by individual Specification Sections, provide Shop Drawings signed and sealed by a professional Engineer responsible for designing components shown on Shop Drawings.
 - 1. Include signed and sealed calculations to support design.
 - 2. Submit Shop Drawings and calculations in form suitable for submission to and approval by authorities having jurisdiction.
 - 3. Make revisions and provide additional information when required by authorities having jurisdiction.
- D. Submit number of opaque reproductions Contractor requires, plus four copies Engineer will retain.
- E. After review, produce copies and distribute according to "Submittal Procedures" Article and for record documents described in Section 017000 - Execution and Closeout Requirements.

1.9 SAMPLES

- A. Samples: Action Submittal: Submit to Engineer for assessing conformance with information given and design concept expressed in Contract Documents.
- B. Samples for Selection as Specified in Product Sections:
 - 1. Submit to Engineer for aesthetic, color, and finish selection.
 - 2. Submit Samples of finishes, textures, and patterns for Engineer selection.
- C. Submit Samples to illustrate functional and aesthetic characteristics of products, with integral parts and attachment devices. Coordinate Sample submittals for interfacing work.
- D. Include identification on each Sample, with full Project information.
- E. Submit number of Samples specified in individual Specification Sections; Engineer will retain one Sample.
- F. Reviewed Samples that may be used in the Work are indicated in individual Specification Sections.
- G. Samples will not be used for testing purposes unless specifically stated in Specification Section.
- H. After review, produce copies and distribute according to "Submittal Procedures" Article and for record documents described in Section 017000 - Execution and Closeout Requirements.

1.10 OTHER SUBMITTALS

- A. Closeout Submittals: Comply with Section 017000 - Execution and Closeout Requirements.

1.11 DESIGN DATA

- A. Informational Submittal: Submit data for Engineer's knowledge as Contract administrator or for Owner.
- B. Submit information for assessing conformance with information given and design concept expressed in Contract Documents.

1.12 TEST REPORTS

- A. Informational Submittal: Submit reports for Engineer's knowledge as Contract administrator or for Owner.
- B. Submit test reports for information for assessing conformance with information given and design concept expressed in Contract Documents.

1.13 CERTIFICATES

- A. Informational Submittal: Submit certification by manufacturer, installation/application Subcontractor, or 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.

1.14 MANUFACTURER'S INSTRUCTIONS

- A. Informational Submittal: Submit manufacturer's installation instructions for Engineer's knowledge as Contract administrator or for Owner.
- B. Submit printed instructions for delivery, storage, assembly, installation, startup, adjusting, and finishing, to Engineer in quantities specified for Product Data.
- C. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.15 MANUFACTURER'S FIELD REPORTS

- A. Informational Submittal: Submit reports for Engineer's knowledge as Contract administrator or for Owner.
- B. Submit report in duplicate within 5 days of observation to Engineer for information.
- C. Submit reports for information for assessing conformance with information given and design concept expressed in Contract Documents.

1.16 ERECTION DRAWINGS

- A. Informational Submittal: Submit Drawings for Engineer's knowledge as Contract administrator or for Owner.
- B. Submit Drawings for information assessing conformance with information given and design concept expressed in Contract Documents.
- C. Data indicating inappropriate or unacceptable Work may be subject to action by Engineer or Owner.

1.17 CONSTRUCTION VIDEOS AND PHOTOGRAPHS

- A. The Contractor shall furnish all equipment and labor materials required to provide the Owner with digital construction videos and photographs of the Project.
- B. Prior to the beginning of any work, the Contractor shall take videos and photographs of the work area to record existing conditions.
- C. Photo and video files shall become the property of the Owner and none of the videos or photographs shall be published without express permission of the Owner.
- D. Following completion of the work, another set of videos and photographs shall be made showing the same areas and features as in the pre-construction videos and photographs.
- E. All conditions which might later be subject to disagreement shall be shown in sufficient detail to provide a basis for decisions.
- F. Photographs shall be in "jpg" format.
- G. Videos shall be in a format viewable by Microsoft Windows Media Player or Apple QuickTime Player. Audio narration is desirable.
- H. Files shall be named such that what is being viewed is self-evident.
- I. Files shall be submitted on a flash drive, compact disk (CD) or a digital video disk (DVD). If submitted on DVD, disk shall be recorded in "Minus R" format.
- J. The pre-construction videos and photographs shall be submitted to the Engineer within 25 calendar days after the date of receipt by the Contractor of Notice to Proceed.
- K. Each month submit photographs with Application for Payment.
- L. Post-construction videos and photographs shall be provided prior to final acceptance of the Project.

1.18 CONTRACTOR REVIEW

- A. Review for compliance with Contract Documents and approve submittals before transmitting to Engineer.

- B. Contractor: Responsible for:
1. Determination and verification of materials including manufacturer's catalog numbers.
 2. Determination and verification of field measurements and field construction criteria.
 3. Checking and coordinating information in submittal with requirements of Work and of Contract Documents.
 4. Determination of accuracy and completeness of dimensions and quantities.
 5. Confirmation and coordination of dimensions and field conditions at Site.
 6. Construction means, techniques, sequences, and procedures.
 7. Safety precautions.
 8. Coordination and performance of Work of all trades.
- C. Stamp, sign or initial, and date each submittal to certify compliance with requirements of Contract Documents.
- D. Do not fabricate products or begin Work for which submittals are required until approved submittals have been received from Engineer.

1.19 ENGINEER REVIEW

- A. Do not make "mass submittals" to Engineer. "Mass submittals" are defined as six or more submittals or items in one day or 15 or more submittals or items in one week. If "mass submittals" are received, Engineer's review time stated above will be extended as necessary to perform proper review. Engineer will review "mass submittals" based on priority determined by Engineer after consultation with Owner and Contractor.
- B. Informational submittals and other similar data are for Engineer's information, do not require Engineer's responsive action, and will not be reviewed or returned with comment.
- C. Submittals made by Contractor that are not required by Contract Documents may be returned without action.
- D. Submittal approval does not authorize changes to Contract requirements unless accompanied by Change Order, Field Order, or Construction Change Directive.
- E. Owner may withhold monies due to Contractor to cover additional costs beyond the second submittal review.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 013300

**SECTION 014000
QUALITY REQUIREMENTS**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Quality control.
- B. Tolerances.
- C. References.
- D. Labeling.
- E. Mockup requirements.
- F. Testing and inspection services.
- G. Manufacturers' field services.

1.2 QUALITY CONTROL

- A. Monitor quality control over suppliers, manufacturers, products, services, Site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with specified standards as the minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- C. Perform Work using persons qualified to produce required and specified quality.
- D. Products, materials, and equipment may be subject to inspection by Engineer at place of manufacture or fabrication. Such inspections shall not relieve Contractor of complying with requirements of Contract Documents.
- E. Supervise performance of Work in such manner and by such means to ensure that Work, whether completed or in progress, will not be subjected to harmful, dangerous, damaging, or otherwise deleterious exposure during construction period.

1.3 TOLERANCES

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' recommended tolerances and tolerance requirements in reference standards. When such tolerances conflict with Contract Documents, request clarification from Engineer before proceeding.

- C. Adjust products to appropriate dimensions; position before securing products in place.

1.4 REFERENCES

- A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of standard except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard by date of issue current as of date of Contract Documents except where specific date is established by code.
- C. Obtain copies of standards and maintain on Site when required by product Specification Sections.
- D. When requirements of indicated reference standards conflict with Contract Documents, request clarification from Engineer before proceeding.
- E. Neither contractual relationships, duties, or responsibilities of parties in Contract nor those of Engineer shall be altered from Contract Documents by mention or inference in reference documents.

1.5 LABELING

- A. Attach label from agency approved by authorities having jurisdiction for products, assemblies, and systems required to be labeled by applicable code.
- B. Label Information: Include manufacturer's or fabricator's identification, approved agency identification, and the following information, as applicable, on each label:
 - 1. Model number.
 - 2. Serial number.
 - 3. Performance characteristics.
- C. Manufacturer's Nameplates, Trademarks, Logos, and Other Identifying Marks on Products: Not allowed on surfaces exposed to view in public areas, interior or exterior.

1.6 MOCK-UP REQUIREMENTS – (NOT USED)

- A. Tests will be performed under provisions identified in this Section and identified in individual product Specification Sections.
- B. Assemble and erect specified or indicated items with specified or indicated attachment and anchorage devices, flashings, seals, and finishes.
- C. Accepted mockups shall be comparison standard for remaining Work.
- D. Where mockup has been accepted by Engineer and is specified in product Specification Sections to be removed, remove mockup and clear area when directed to do so by Engineer.

1.7 TESTING AND INSPECTION SERVICES

- A. Contractor will provide an Owner approved testing firm to perform testing and inspection.
- B. The testing firm will perform tests, inspections, and other services specified in individual Specification Sections and as required by Engineer and authorities having jurisdiction.
 - 1. Laboratory: Authorized to operate at Project location in State of Georgia.
 - 2. Laboratory Staff: Maintain full-time specialist on staff to review services.
 - 3. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to National Bureau of Standards or accepted values of natural physical constants.
- C. Testing, inspections, and source quality control may occur on or off Project Site. Perform off-Site testing as required by Engineer or Owner.
- D. Reports shall be submitted by representative to Engineer, Contractor, and authorities having jurisdiction, in duplicate, indicating observations and results of tests and compliance or noncompliance with Contract Documents.
 - 1. Submit final report indicating correction of Work previously reported as noncompliant.
- E. Furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.
 - 1. Notify Engineer and representative 24 hours before expected time for operations requiring services.
 - 2. Make arrangements with representative and pay for testing required by these specifications
- F. Employment of testing agency or laboratory shall not relieve Contractor of obligation to perform Work according to requirements of Contract Documents.
- G. Retesting or re-inspection required because of nonconformance with specified or indicated requirements shall be performed by same independent firm on instructions from Engineer. No payment will be made for additional testing required due to the failure of the Contractor to meet the requirements of these specifications.
- H. Agency Responsibilities:
 - 1. Test Samples of mixes submitted by Contractor.
 - 2. Provide qualified personnel at Site. Cooperate with Engineer and Contractor in performance of services.
 - 3. Perform indicated sampling and testing of products according to specified standards.
 - 4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 - 5. Promptly notify Engineer and Contractor of observed irregularities or nonconformance of Work or products.
 - 6. Perform additional tests required by Engineer.
 - 7. Attend preconstruction meetings and progress meetings.

- I. Agency Reports: After each test, promptly submit two copies of report to Engineer, Contractor, and authorities having jurisdiction. When requested by Engineer, provide interpretation of test results. Include the following:
 - 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 Specification Section.
 - 6. Location in Project.
 - 7. Type of inspection or test.
 - 8. Date of test.
 - 9. Results of tests.
 - 10. Conformance with Contract Documents.
- J. Limits on Testing Authority:
 - 1. Agency or laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 - 2. Agency or laboratory may not approve or accept any portion of the Work.
 - 3. Agency or laboratory may not assume duties of Contractor.
 - 4. Agency or laboratory has no authority to stop the Work.

1.8 MANUFACTURER'S FIELD SERVICES

- A. When specified in individual Specification Sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe Site conditions, conditions of surfaces and installation, quality of workmanship, startup of equipment, testing, adjusting, and balancing of equipment, commissioning as applicable, and to initiate instructions when necessary.
- B. Submit qualifications of observer to Engineer 30 days in advance of required observations. Observer is subject to approval of Engineer. Observer is subject to approval of Owner.
- C. Report observations and Site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturer's written instructions.
- D. Refer to Section 013300 - Submittal Procedures, "Manufacturer's Field Reports" Article.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 014000

SECTION 014529
TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.1 SCOPE

- A. This Section includes testing which the Owner may require, beyond that testing required of the manufacturer, to determine if materials provided for the Project meet the requirements of these Specifications.
- B. This work also includes all testing required by the Owner to verify work performed by the Contractor is in accordance with the requirements of these Specifications, i.e., concrete strength and slump testing, soil compaction, etc.
- C. This work does not include materials testing required in various sections of these Specifications to be performed by the manufacturer, e.g., testing of pipe.
- D. The testing laboratory or laboratories will be selected by the Contractor and approved by the Owner. The testing laboratory or laboratories will work for the Contractor and payment for the testing required in these specifications will be the responsibility of the Contractor.

1.2 PAYMENT FOR TESTING SERVICES

- A. The cost of testing services required by the Contract to be provided by the Contractor shall be paid for by the Contractor. No special payment will be made for the testing required by these specifications, as the testing will be considered a part of the bid items to which they pertain.
- B. The cost of additional testing services not specifically required in the Specifications, but requested by the Owner or Engineer, shall be paid for by the Owner.
- C. The cost of material testing described in various sections of these Specifications or as required in referenced standards to be provided by a material manufacturer, shall be included in the price bid for that item and shall not be paid for by the Owner.
- D. The cost of retesting any item that fails to meet the requirements of these Specifications shall be paid for by the Contractor. Retesting shall be performed by the testing laboratory working for the Owner.

1.3 LABORATORY DUTIES

- A. Cooperate with the Owner, Engineer and Contractor.
- B. Provide qualified personnel promptly on notice.
- C. Perform specified inspections, sampling and testing of materials.
 - 1. Comply with specified standards, ASTM, other recognized authorities, and as specified.

2. Ascertain compliance with requirements of the Contract Documents.
- D. Promptly notify the Engineer and Contractor of irregularities or deficiencies of work which are observed during performance of services.
 - E. Promptly submit three copies (two copies to the Engineer and one copy to the Contractor) of report of inspections and tests in addition to those additional copies required by the Contractor with the following information included:
 1. Date issued
 2. Project title and number
 3. Testing laboratory name and address
 4. Name and signature of inspector
 5. Date of inspection or sampling
 6. Record of temperature and weather
 7. Date of test
 8. Identification of product and Specification section
 9. Location of Project
 10. Type of inspection or test
 11. Results of test
 12. Observations regarding compliance with the Contract Documents
 - F. Perform additional services as required.
 - G. The laboratory is not authorized to release, revoke, alter or enlarge on requirements of the Contract Documents, or approve or accept any portion of the work.

1.4 CONTRACTOR RESPONSIBILITIES

- A. Cooperate with laboratory personnel, provide access to work and/or comply with manufacturer's requirements.
- B. Provide to the laboratory, representative samples, in required quantities, of materials to be tested.
- C. Furnish copies of mill test reports.
- D. Furnish required labor and facilities to:

1. Provide access to work to be tested;
 2. Obtain and handle samples at the site;
 3. Facilitate inspections and tests;
 4. Build or furnish a holding box for concrete cylinders or other samples as required by the laboratory.
- E. Notify the laboratory sufficiently in advance of operation to allow for the assignment of personnel and schedules of tests.
- F. Laboratory Tests: Where such inspection and testing are to be conducted by an independent laboratory agency, the sample(s) shall be selected by such laboratory or agency, or the Engineer, and shipped to the laboratory by the Contractor at Contractor's expense.
- G. Copies of all correspondence between the Contractor and testing agencies shall be provided to the Engineer.

1.5 QUALITY ASSURANCE

Testing shall be in accordance with all pertinent codes and regulations and with procedures and requirements of the American Society for Testing and Materials (ASTM).

1.6 PRODUCT HANDLING

Promptly process and distribute all required copies of test reports and related instructions to insure all necessary retesting or replacement of materials with the least possible delay in the progress of the work.

1.7 FURNISHING MATERIALS

The Contractor shall be responsible for furnishing all materials necessary for testing.

1.8 CODE COMPLIANCE TESTING

Inspections and tests required by codes or ordinances or by a plan approval authority, and made by a legally constituted authority, shall be the responsibility of, and shall be paid for by the Contractor, unless otherwise provided in the Contract Documents.

1.9 CONTRACTOR'S CONVENIENCE TESTING

Inspection or testing performed exclusively for the Contractor's convenience shall be the sole responsibility of the Contractor.

1.10 SCHEDULES FOR TESTING

A. Establishing Schedule

1. The Contractor shall, by advance discussion with the testing laboratory selected by the Owner, determine the time required for the laboratory to perform its tests and to issue each of its findings, and make all arrangements for the testing laboratory to be on site to provide the required testing.
2. Provide all required time within the construction schedule.

B. When changes of construction schedule are necessary during construction, coordinate all such changes of schedule with the testing laboratory as required.

C. When the testing laboratory is ready to test according to the determined schedule, but is prevented from testing or taking specimens due to incompleteness of the work, all extra costs for testing attributable to the delay will be back-charged to the Contractor and shall not be borne by the Owner.

1.11 TAKING SPECIMENS

Unless otherwise provided in the Contract Documents, all specimens and samples for tests will be taken by the testing laboratory or the Engineer.

1.12 TRANSPORTING SAMPLES

The Contractor shall be responsible for transporting all samples, except those taken by testing laboratory personnel, to the testing laboratory.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 014529

SECTION 015000
TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Temporary facilities under Construction Management Agreement.
- B. Temporary Utilities:
 - 1. Temporary electricity.
 - 2. Temporary lighting for construction purposes.
 - 3. Temporary heating.
 - 4. Temporary cooling.
 - 5. Temporary ventilation.
 - 6. Communication services.
 - 7. Temporary water service.
 - 8. Temporary sanitary facilities.
- C. Construction Facilities:
 - 1. Field offices and sheds.
 - 2. Vehicular access.
 - 3. Parking.
 - 4. Progress cleaning and waste removal.
 - 5. Project identification.
 - 6. Traffic regulation.
 - 7. Fire-prevention facilities.
- D. Temporary Controls:
 - 1. Barriers.
 - 2. Enclosures and fencing.
 - 3. Security.
 - 4. Water control.
 - 5. Dust control.
 - 6. Erosion and sediment control.
 - 7. Noise control.
 - 8. Pest and rodent control.
 - 9. Pollution control.
- E. Removal of utilities, facilities, and controls.

1.2 REFERENCES

- A. ASTM International:

1. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
2. ASTM E 90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
3. ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials.

1.3 TEMPORARY FACILITIES UNDER CONSTRUCTION MANAGEMENT AGREEMENT

A. Temporary Provisions Provided by Construction Manager:

1. Temporary barriers, barricades, covered walkways, fencing, exterior closures, and interior closures.
2. Temporary field offices.
3. Cleaning during construction.
4. Access roads and approaches.
5. Temporary elevator.
6. Temporary sanitary facilities.
7. Temporary heating and ventilating after enclosure.
8. Temporary electrical service and distribution system for power and lighting.
9. Temporary telephone and internet service.

B. Each Contractor: Coordinate provisions with Construction Manager and provide the following items as necessary for execution of the Work including associated costs:

1. Construction aids.
2. Temporary fire protection, dust control, erosion and sediment control, water control, noise control, and other necessary temporary controls.
3. Temporary barriers, barricades, and similar devices as necessary for safety and protection of construction personnel and public.
4. On Construction Manager's approval, may provide temporary field office including electrical service and temporary telephone.
5. Temporary tree and plant protection.
6. Temporary heating before building enclosure.
7. Electrical service required in addition to temporary service and distribution provided by Construction Manager.
8. Temporary provisions for protection of installed Work.

1.4 TEMPORARY ELECTRICITY

- A. Provide and pay for power service required from utility source as needed for construction operation. Use Owner's existing power service, provide separate metering, and reimburse Owner for cost of energy used.
- B. Provide temporary electric feeder from existing electrical service as directed by Engineer. Do not disrupt Owner's use of service.
- C. Complement existing power service capacity and characteristics as required for construction operations.

- D. Provide power outlets with branch wiring and distribution boxes located as required for construction operations. Provide suitable, flexible power cords as required for portable construction tools and equipment.
- E. Provide meter at source distribution equipment.
- F. Permanent convenience receptacles may be used during construction.
- G. Provide distribution equipment, wiring, and outlets for single-phase branch circuits for power and lighting.
 - 1. Provide 20-ampere duplex outlets, single-phase circuits for power tools for active work area.
 - 2. Provide 20-ampere, single-phase branch circuits for lighting.

1.5 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES

- A. Provide and maintain incandescent lighting for construction operations.
- B. Provide and maintain after dark for security purposes.
- C. Provide and maintain HID lighting to interior work areas after dark for security purposes.
- D. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, lamps, and the like, for specified lighting levels.
- E. Maintain lighting and provide routine repairs.
- F. Permanent building lighting may be used during construction.

1.6 TEMPORARY HEATING

- A. Provide heating devices and heat as needed to maintain specified conditions for construction operations.
- B. Enclose building before activating temporary heat according to "Enclosures and Fencing" Article in this Section.
- C. Before operating permanent equipment for temporary heating purposes, verify installation is approved for operation, equipment is lubricated, and filters are in place. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts. Replace filters at Substantial Completion.
- D. Maintain minimum ambient temperature in areas where construction is in progress unless indicated otherwise in individual product Sections.

1.7 TEMPORARY COOLING

- A. Provide cooling devices and cooling as needed to maintain specified conditions for construction operations.
- B. Enclose building before activating temporary cooling according to ""Enclosures and Fencing"" Article in this Section.
- C. Before operating permanent equipment for temporary cooling purposes, verify installation is approved for operation, equipment is lubricated, and filters are in place. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts. Replace filters at Substantial Completion.
- D. Maintain maximum ambient temperature in areas where construction is in progress unless indicated otherwise in individual product Sections.

1.8 TEMPORARY VENTILATION

- A. Ventilate enclosed areas to achieve curing of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- B. Use existing ventilation equipment. Extend and supplement equipment with temporary fan units as required to maintain clean air for construction operations.

1.9 COMMUNICATION SERVICES

- A. Telephone Service: Provide, maintain, and pay for telephone service to field office and Engineer's field office at time of Project mobilization and until completion of Work.
- B. Facsimile Service: Provide, maintain, and pay for facsimile service including dedicated telephone line to field office and Engineer's field office at time of Project mobilization and until completion of Work.
- C. Internet Service: Provide, maintain, and pay for broadband Internet service to field office and Engineer's field office at time of Project mobilization. Provide desktop computer with Microsoft operating system and appropriate office function software, modem, and printer.

1.10 TEMPORARY WATER SERVICE

- A. Provide suitable quality water service as needed to maintain specified conditions for construction operations.
- B. Extend branch piping with outlets located so that water is available by hoses with threaded connections. Provide temporary pipe insulation and heat tape to prevent freezing.

1.11 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures. Existing facility use is not permitted. Provide facilities at time of Project mobilization.
- B. At end of construction, return existing facilities used for construction operations to same or better condition as original condition.

1.12 FIELD OFFICES AND SHEDS (NOT USED)

- A. Designated existing spaces may be used for field offices,
- B. Provide space for Project meetings, with table and chairs.
- C. Provide separate private office similarly equipped and furnished, for use of Engineer.
- D. Locate field offices and sheds a minimum distance of 30 feet from existing and new structures.
- E. Do not use permanent facilities for field offices or for storage.
- F. Construction: Portable or mobile buildings, or buildings constructed with floors raised aboveground, securely fixed to foundations with steps and landings at entrance doors.
 - 1. Construction: Structurally sound, secure, weathertight enclosures for office and storage spaces. Maintain during progress of Work; remove enclosures at completion of Work.
 - 2. Thermal Resistance of Floors, Walls, and Ceilings: Compatible with occupancy and storage requirements.
 - 3. Exterior Materials: Weather-resistant, finished in one color acceptable to Engineer.
 - 4. Interior Materials in Field Offices: Sheet-type materials for walls and ceilings, prefinished or painted; resilient floors and bases.
 - 5. Lighting for Field Offices: 50 ft-C at desktop height; exterior lighting at entrance doors.
 - 6. Interior Materials in Storage Sheds: As required to provide specified conditions for storage of products.
- G. Environmental Control:
 - 1. Heating, Cooling, and Ventilating for Offices: Automatic equipment to maintain comfort conditions.
 - 2. Storage Spaces: Heating and ventilating as needed to maintain products according to Contract Documents; lighting for maintenance and inspection of products.
- H. Engineer Field Office:
 - 1. Separate space for use of Engineer only, with separate entrance door with new lock and two keys.
 - 2. Area: Minimum 150 sq ft, minimum dimension 8 ft.
 - 3. Windows: Minimum of three with a minimum total area of 10 percent of floor area, with operable sash and insect screens. Locate windows to provide views of construction area.
 - 4. Electrical Distribution Panel: Two circuits minimum, 110-volt, 60 Hz service.
 - 5. Minimum of four 110-volt duplex convenience outlets, one on each wall.

6. Communication Services: As specified in this Section.
7. Sanitary Facilities: Convenient access to private lavatory facilities.
8. Drinking Fountain: Convenient access by workers.
9. Engineer Field Office Furnishings:
 - a. One desk 54 x 30 inches, with three drawers.
 - b. One drafting table 36 x 72 inches, with one equipment drawer and full-width parallel straight edge.
 - c. One metal, double-door storage cabinet under table.
 - d. Plan rack to hold working Drawings, Shop Drawings, and Record Documents.
 - e. One standard four-drawer letter-size metal filing cabinet with locks and two keys for each lock.
 - f. Six linear ft of metal bookshelves.
 - g. Two swivel armchairs.
 - h. Two straight chairs.
 - i. One drafting table stool.
 - j. One tackboard 36 x 30 inches.
 - k. One wastebasket for each desk and table.
- I. Storage Areas and Sheds: Size to storage requirements for products of individual Sections, allowing for access and orderly provision for maintenance and inspection of products to suit requirements in Section 016000 - Product Requirements.
- J. Preparation: Fill and grade Sites for temporary structures sloped for drainage away from buildings.
- K. Installation:
 1. Install field office spaces ready for occupancy 15 days after date established by Notice to Proceed.
 2. Employee Residential Occupancy: Not allowed on Owner's property.
- L. Maintenance and Cleaning:
 1. Weekly janitorial services for field offices; periodic cleaning and maintenance for sheds and storage areas.
 2. Maintain walks free of mud, water, snow, and the like.
- M. Removal: At completion of Work remove buildings, foundations, utility services, and debris. Restore areas to same or better condition as original condition.

1.13 VEHICULAR ACCESS

- A. Construct temporary all-weather access roads from public thoroughfares to serve construction area, of width and load-bearing capacity to accommodate unimpeded traffic for construction purposes.
- B. Construct temporary bridges and culverts to span low areas and allow unimpeded drainage.

- C. Extend and relocate vehicular access as Work progress requires and provide detours as necessary for unimpeded traffic flow.
- D. Locate as approved by Engineer.
- E. Provide unimpeded access for emergency vehicles. Maintain 20-foot-wide driveways with turning space between and around combustible materials.
- F. Provide and maintain access to fire hydrants and control valves free of obstructions.
- G. Provide means of removing mud from vehicle wheels before entering streets.
- H. Use designated existing on-Site roads for construction traffic.

1.14 PARKING

- A. Provide temporary gravel surface parking areas to accommodate construction personnel.
- B. Locate as approved by Engineer.
- C. If Site space is not adequate, provide additional off-Site parking.
- D. Use of designated areas of existing on-Site streets and driveways used for construction traffic is permitted. Tracked vehicles are not allowed on paved areas.
- E. Use of designated areas of existing parking facilities used by construction personnel is [not] permitted.
- F. Do not allow heavy vehicles or construction equipment in parking areas.
- G. Do not allow vehicle parking on existing pavement.
- H. Designate one parking spaces for Engineer.
- I. Permanent Pavements and Parking Facilities:
 - 1. Bases for permanent roads and parking areas may be used for construction traffic.
 - 2. Avoid traffic loading beyond paving design capacity. Tracked vehicles are not allowed.
 - 3. Use of permanent parking structures is not permitted.
- J. Maintenance:
 - 1. Maintain traffic and parking areas in sound condition free of excavated material, construction equipment, products, mud, snow, ice, and the like.
 - 2. Maintain existing and permanent paved areas used for construction; promptly repair breaks, potholes, low areas, standing water, and other deficiencies, to maintain paving and drainage in original condition.
- K. Removal, Repair:

1. Remove temporary materials and construction when permanent paving is usable at Substantial Completion.
 2. Remove underground Work and compacted materials to depth of 2 feet; fill and grade Site as indicated.
 3. Repair existing facilities damaged by use, to original condition.
- L. Mud from Site vehicles: Provide means of removing mud from vehicle wheels before entering streets.

1.15 PROGRESS CLEANING AND WASTE REMOVAL

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain Site in clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, before enclosing spaces.
- C. Broom and vacuum clean interior areas before starting surface finishing, and continue cleaning to eliminate dust.
- D. Collect and remove waste materials, debris, and rubbish from Site weekly and dispose of off-Site. Comply with Section 017419 - Construction Waste Management and Disposal.
- E. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.16 PROJECT IDENTIFICATION

- A. Project Identification Sign:
 1. One painted sign of construction, design, and content shown on Drawings, location designated.
 2. Content:
 - a. Project number, title, logo, and name of Owner.
 - b. Names and titles of authorities.
 - c. Names and titles of Engineer and Consultants.
 - d. Name of Prime Contractor and major Subcontractors.
 3. Lettering: Series C of Standard Alphabet for Traffic Control Devices, "Manual on Uniform Traffic Control Devices for Streets and Highways," Federal Highway Administration.
- B. Project Informational Signs:
 1. Painted informational signs of same colors and lettering as Project identification sign or standard products; size lettering for legibility at 100-foot distance.

2. Provide sign at each field office and storage shed, and provide directional signs to direct traffic into and within Site. Relocate as Work progress requires.
 3. Provide state traffic agency directional traffic signs to and within Site.
 4. No other signs are allowed without Owner's permission except those required by law.
- C. Design sign and structure to withstand 60-mph wind velocity.
- D. Sign Painter: Experienced as professional sign painter for minimum of three years.
- E. Finishes, Painting: Adequate to withstand weathering, fading, and chipping for duration of construction.
- F. Show content, layout, lettering, color, foundation, structure, sizes, and grades of members.
- G. Sign Materials:
1. Structure and Framing: New and structurally adequate.
 2. Sign Surfaces: Exterior grade plywood with medium-density overlay, minimum of 3/4 inches thick, standard large sizes to minimize joints.
 3. Rough Hardware: Galvanized aluminum or brass.
 4. Paint and Primers: Exterior quality, two coats; sign background of color as selected.
 5. Lettering: Precut vinyl self-adhesive products or quality exterior paint, contrasting in colors as selected.
- H. Installation:
1. Install Project identification sign within 15 days after date established by Notice to Proceed.
 2. Erect at designated location.
 3. Erect supports and framing on secure foundation, rigidly braced and framed to resist wind loadings.
 4. Install sign surface plumb and level, with butt joints. Anchor securely.
 5. Paint exposed surfaces of sign, supports, and framing.
- I. Maintenance: Maintain clean signs and supports; repair deterioration and damage.
- J. Removal: Remove signs, framing, supports, and foundations at completion of Project and restore area.

1.17 TRAFFIC REGULATION

- A. Signs, Signals, and Devices:
1. Post-Mounted and Wall-Mounted Traffic Control and Informational Signs: As approved by authorities having jurisdiction.
 2. Automatic Traffic Control Signals: As approved by local jurisdictions.
 3. Traffic Cones, Drums, Flares, and Lights: As approved by authorities having jurisdiction.
 4. Flag Person Equipment: As required by authorities having jurisdiction.

- B. Flag Persons: Provide trained and equipped flag persons to regulate traffic when construction operations or traffic encroach on public traffic lanes.
- C. Flares and Lights: Use flares and lights during hours of low visibility to delineate traffic lanes and to guide traffic.
- D. Haul Routes:
 - 1. Consult with authorities having jurisdiction and establish public thoroughfares to be used for haul routes and Site access.
 - 2. Confine construction traffic to designated haul routes.
 - 3. Provide traffic control at critical areas of haul routes to regulate traffic and to minimize interference with public traffic.
- E. Traffic Signs and Signals:
 - 1. Provide signs at approaches to Site and on Site, at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public traffic.
 - 2. Provide, operate, and maintain automatic traffic control signals to direct and maintain orderly flow of traffic in areas under Contractor's control and areas affected by Contractor's operations.
 - 3. Relocate signs and signals as Work progresses, to maintain effective traffic control.
- F. Removal:
 - 1. Remove equipment and devices at Substantial Completion.
 - 2. Repair damage caused by installation.
 - 3. Remove post settings to depth of 2 feet.

1.18 FIRE-PREVENTION FACILITIES

- A. Prohibit smoking within buildings under construction and demolition. Designate area on Site where smoking is permitted. Provide approved ashtrays in designated smoking areas.
- B. Establish fire watch for cutting, welding, and other hazardous operations capable of starting fires. Maintain fire watch before, during, and after hazardous operations until threat of fire does not exist.
- C. Standpipes: Maintain existing standpipes in usable condition to height within one floor of floor being demolished.
- D. Portable Fire Extinguishers: NFPA 10; 10-pound capacity, 4A-60B: C UL rating.
 - 1. Provide one fire extinguisher at each stairway on each floor of buildings under construction and demolition.
 - 2. Provide minimum of one fire extinguisher in every construction trailer and storage shed.
 - 3. Provide minimum of one fire extinguisher on roof during roofing operations using heat-producing equipment.

1.19 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
- B. Provide barricades and covered walkways required by authorities having jurisdiction for public rights-of-way and for public access to existing building.
 - 1. Barricade Construction: As indicated on Drawings.
 - 2. Covered Walkway Construction: As indicated on Drawings.
- C. Tree and Plant Protection: Preserve and protect existing trees and plants designated to remain.
 - 1. Protect areas within drip lines from traffic, parking, storage, dumping, chemically injurious materials and liquids, ponding, and continuous running water.
 - 2. Provide 6-foot high barriers around drip line, with access for maintenance.
 - 3. Replace trees and plants damaged by construction operations.
- D. Protect non-owned vehicular traffic, stored materials, Site, and structures from damage.

1.20 ENCLOSURES AND FENCING

- A. Construction: Contractor's option.
- B. Provide 6-foot high fence around construction Site; equip with vehicular and pedestrian gates with locks.
- C. Exterior Enclosures:
 - 1. Provide temporary insulated weathertight closure of exterior openings to accommodate acceptable working conditions and protection for products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual Specification Sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.
 - 2. Provide temporary roofing as specified.
- D. Interior Enclosures:
 - 1. Provide temporary partitions and ceilings as indicated on Drawings to separate work areas from Owner-occupied areas, to prevent penetration of dust and moisture into Owner-occupied areas, and to prevent damage to existing materials and equipment.
 - 2. Construction: Framing and reinforced polyethylene, plywood or gypsum board materials with closed joints and sealed edges at intersections with existing surfaces.
 - a. Insulated to R-19.
 - b. STC rating of 35 according to ASTM E 90.
 - c. Surface-Burning Characteristics: Maximum flame-spread/smoke-developed index when tested according to ASTM E 84.
 - d. Fire-Rated Wall, Floor or Roof Construction: Rating as indicated on Drawings.

- 1) Tested Rating: Determined according to ASTM E 119.
3. Paint surfaces exposed to view from Owner-occupied areas.

1.21 SECURITY

A. Security Program:

1. Protect Work on existing premises and Owner's operations from theft, vandalism, and unauthorized entry.
2. Initiate program in coordination with Owner's existing security system at Project mobilization.
3. Maintain program throughout construction period until directed by Engineer.

B. Entry Control:

1. Restrict entrance of persons and vehicles to Project Site and existing facilities.
2. Allow entrance only to authorized persons with proper identification.
3. Maintain log of workers and visitors and make available to Owner on request.
4. Coordinate access of Owner's personnel to Site in coordination with Owner's security forces.

C. Personnel Identification:

1. Provide identification badge for each person authorized to enter premises.
2. Badge to Include: Personal photograph, name, assigned number, expiration date, and employer.
3. Maintain list of accredited persons and submit copy to Owner on request.
4. Require return of badges at expiration of employment on the Work.

D. Security Service:

1. Employ uniformed guard or patrol service to provide guards on Site twenty-four hours a day, seven days a week.

E. Restrictions:

1. Do not allow cameras on Site or photographs taken except by written approval of Owner.
2. Do no work on days indicated in Owner-Contractor Agreement.

1.22 WATER CONTROL

- A. Grade Site to drain. Maintain excavations free of water. Provide, operate, and maintain necessary pumping equipment.
- B. Protect Site from puddles or running water.

1.23 DUST CONTROL

- A. Execute Work by methods that minimize raising dust from construction operations.
- B. Provide positive means to prevent airborne dust from dispersing into atmosphere and into Owner-occupied areas.

1.24 EROSION AND SEDIMENT CONTROL

- A. Plan and execute construction by methods to control surface drainage from cuts and fills from borrow and waste disposal areas. Prevent erosion and sedimentation.
- B. Minimize surface area of bare soil exposed at one time.
- C. Provide temporary measures including berms, dikes, drains, and other devices to prevent water flow.
- D. Construct fill and waste areas by selective placement to avoid erosive surface silts and clays.
- E. Periodically inspect earthwork to detect evidence of erosion and sedimentation. Promptly apply corrective measures.
- F. Comply with sediment and erosion control plan indicated on Drawings.

1.25 NOISE CONTROL

- A. Provide methods, means, and facilities to minimize noise produced by construction operations.

1.26 PEST AND RODENT CONTROL

- A. Provide methods, means, and facilities to prevent pests and insects from damaging the Work or entering facility.
- B. Provide methods, means, and facilities to prevent rodents from accessing or invading premises.

1.27 POLLUTION CONTROL

- A. Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances and pollutants produced by construction operations.
- B. Comply with pollution and environmental control requirements of authorities having jurisdiction.

1.28 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, and materials before Final Application for Payment.

- B. Remove underground installations to minimum depth of 2 feet. Grade Site as indicated on Drawings.
- C. Clean and repair damage caused by installation or use of temporary Work.
- D. Restore existing and permanent facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

1.29 BYPASS PUMPING

- A. Provide bypass pumping for storm flows as well as sewage flows as needed during the construction period.
- B. Submit detailed plan, including size and location of access points for suction and discharge hoses, sewer plugging method, proposed pipe sizes, and design flowrates to Engineer for approval prior to beginning construction.
- C. Bypass pumps and piping must be capable of carrying peak flows and must operate 24 hours per day. Schedule and perform work in manner that does not cause or contribute to incidence of overflows, releases, or spill so sewage from sanitary sewer system or bypass operation.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 015000

**SECTION 015616
DUST CONTROL**

PART 1 - GENERAL

1.1 SCOPE

- A. Limit blowing dust caused by construction operations by applying water or employing other appropriate means or methods to maintain dust control, subject to the approval of the Owner. As a minimum, this may require the use of a water wagon twice a day to suppress dusty conditions.

1.2 PROTECTION OF ADJACENT PROPERTY

- A. The Bidders shall visit the site and note the buildings, landscaping, roads, parking areas and other facilities near the work site that may be damaged by their operations. The Contractor shall make adequate provision to fully protect the surrounding area and will be held fully responsible for all damages resulting from Contractor's operations.
- B. Protect all existing facilities (indoors or out) from damage by dust, fumes, spray or spills (indoors or out). Protect motors, bearings, electrical gear, instrumentation and building or other surfaces from dirt, dust, welding fumes, paint spray, spills or droppings causing wear, corrosion, malfunction, failure or defacement by enclosure, sprinkling or other dust palliatives, masking and covering, exhausting or containment.

END OF SECTION 015616

**SECTION 015633
JOB SITE SECURITY**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Temporary Barricades.
- B. Temporary Fencing.

1.2 BARRICADES, LIGHTS AND SIGNALS

- A. The Contractor shall furnish and erect such barricades, fences, lights and danger signals and shall provide such other precautionary measures for the protection of persons or property and of the work as necessary. Barricades shall be painted in a color that will be visible at night. From sunset to sunrise, the Contractor shall furnish and maintain at least one light at each barricade and sufficient numbers of barricades shall be erected to keep vehicles from being driven on or into any work under construction.
- B. The Contractor will be held responsible for all damage to the work due to failure of barricades, signs and lights and whenever evidence is found of such damage, the Contractor shall immediately remove the damaged portion and replace it at Contractor's cost and expense. The Contractor's responsibility for the maintenance of barricades, signs and lights shall not cease until the Project has been accepted by the Owner.
- C. Traffic control devices shall comply with the latest edition of the Manual on Uniform Traffic Control Devices for Streets and Highways.

1.3 TEMPORARY FENCING

- A. Prior to the start of work, enclose those areas at the construction site which are not within the existing fencing with a temporary safety fence, including gates and warning signs, to protect the public from construction activities. Remove the fence from the work site upon completion of the contract.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 015633

**SECTION 016000
PRODUCT REQUIREMENTS**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Products.
- B. Product delivery requirements.
- C. Product storage and handling requirements.
- D. Product options.
- E. Equipment electrical characteristics and components.

1.2 PRODUCTS

- A. At minimum, comply with specified requirements and reference standards.
- B. Specified products define standard of quality, type, function, dimension, appearance, and performance required.
- C. Furnish products of qualified manufacturers that are suitable for intended use. Furnish products of each type by single manufacturer unless specified otherwise. Confirm that manufacturer's production capacity can provide sufficient product, on time, to meet Project requirements.
- D. Domestic Products: Except where specified otherwise, domestic products are required and interpreted to mean products mined, manufactured, fabricated, or produced in United States or its territories.
- E. Do not use materials and equipment removed from existing premises except as specifically permitted by Contract Documents.
- F. Furnish interchangeable components from same manufacturer for components being replaced.

1.3 PRODUCT DELIVERY REQUIREMENTS

- A. Comply with delivery requirements in Section 017400 - Construction Waste Management and Disposal.
- B. Transport and handle products according to manufacturer's instructions.
- C. Promptly inspect shipments to ensure products comply with requirements, quantities are correct, and products are undamaged.
- D. Provide equipment and personnel to handle products; use methods to prevent soiling, disfigurement, or damage.

1.4 PRODUCT STORAGE AND HANDLING REQUIREMENTS

- A. Store and protect products according to manufacturer's instructions.
- B. Store products with seals and labels intact and legible.
- C. Store sensitive products in weathertight, climate-controlled enclosures in an environment suitable to product.
- D. For exterior storage of fabricated products, place products on sloped supports aboveground.
- E. Provide off-Site storage and protection when Site does not permit on-Site storage or protection.
- F. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- G. Store loose granular materials on solid flat surfaces in well-drained area. Prevent mixing with foreign matter.
- H. Provide equipment and personnel to store products; use methods to prevent soiling, disfigurement, or damage.
- I. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

1.5 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Products complying with specified reference standards or description.
- B. Products Specified by Naming One or More Manufacturers: Products of one of manufacturers named and complying with Specifications; no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with Provision for Substitutions: Submit Request for Substitution for any manufacturer not named, according to Section 012500 - Substitution Procedures.

PART 2 - PRODUCTS

2.1 EQUIPMENT ELECTRICAL CHARACTERISTICS AND COMPONENTS

- A. Wiring Terminations: Furnish terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Include lugs for terminal box.
- B. Cord and Plug: Furnish minimum 6-foot long cord and plug including grounding connector for connection to electric wiring system. Cord of longer length may be specified in individual Specification Sections.

PART 3 - EXECUTION - Not Used

END OF SECTION 016000

SECTION 017000
EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Field engineering.
- B. Closeout procedures.
- C. Starting of systems.
- D. Demonstration and instructions.
- E. Testing, adjusting, and balancing.
- F. Project record documents.
- G. Operation and maintenance data.
- H. Manual for materials and finishes.
- I. Manual for equipment and systems.
- J. Spare parts and maintenance products.
- K. Product warranties and product bonds.
- L. Maintenance service.
- M. Examination.
- N. Preparation.
- O. Execution.
- P. Cutting and patching.
- Q. Protecting installed construction.
- R. Final cleaning.

1.2 FIELD ENGINEERING

- A. Employ land surveyor registered in State of Georgia and acceptable to Engineer.
- B. Contractor shall locate and protect survey control and reference points. Promptly notify Engineer of discrepancies discovered.

- C. Control datum for survey is established by Owner-provided survey.
- D. Prior to beginning Work, verify and establish floor elevations of existing facilities to ensure that new Work will meet existing elevations in smooth and level alignment except where specifically detailed or indicated otherwise.
- E. Verify setbacks and easements; confirm Drawing dimensions and elevations.
- F. Provide field engineering services. Establish elevations, lines, and levels using recognized engineering survey practices.
- G. Submit copy of Site drawing and certificate signed by land surveyor certifying elevations and locations of the Work are in conformance with Contract Documents.
- H. Maintain complete and accurate log of control and survey Work as Work progresses.
- I. On completion of foundation walls and major Site improvements, prepare certified survey illustrating dimensions, locations, angles, elevations of construction and Site Work.
- J. Protect survey control points prior to starting Site Work; preserve permanent reference points during construction.
- K. Promptly report to Engineer loss or destruction of reference point or relocation required because of changes in grades or other reasons.
- L. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to /Engineer.
- M. Final Property Survey: Prior to Substantial Completion, prepare final property survey illustrating locations, dimensions, angles, and elevations of buildings and Site Work that have resulted from construction indicating their relationship to permanent bench marks and property lines.
 - 1. Show significant features (real property) for Project.
 - 2. Include certification on survey, signed by surveyor, that principal metes, bounds, lines, levels, and elevations of Project are accurately shown.

1.3 CLOSEOUT PROCEDURES

- A. Prerequisites to Substantial Completion: Complete following items before requesting Certification of Substantial Completion, either for entire Work or for portions of Work:
 - 1. Submit maintenance manuals, Project record documents, digital images of construction photographs, and other similar final record data in compliance with this Section.
 - 2. Complete facility startup, testing, adjusting, balancing of systems and equipment, demonstrations, and instructions to Owner's operating and maintenance personnel as specified in compliance with this Section.
 - 3. Conduct inspection to establish basis for request that Work is substantially complete. Create comprehensive list (initial punch list) indicating items to be completed or corrected, value of incomplete or nonconforming Work, reason for being incomplete, and date of

anticipated completion for each item. Include copy of list with request for Certificate of Substantial Completion.

4. Obtain and submit releases enabling Owner's full, unrestricted use of Project and access to services and utilities. Include certificate of occupancy, operating certificates, and similar releases from authorities having jurisdiction and utility companies.
5. Deliver tools, spare parts, extra stocks of material, and similar physical items to Owner.
6. Make final change-over of locks and transmit keys directly to Owner. Advise Owner's personnel of change-over in security provisions.
7. Discontinue or change over and remove temporary facilities and services from Project Site, along with construction tools, mockups, and similar elements.
8. Perform final cleaning according to this Section.

B. Substantial Completion Inspection:

1. When Contractor considers Work to be substantially complete, submit to Engineer:
 - a. Written certificate that Work, or designated portion, is substantially complete.
 - b. List of items to be completed or corrected (initial punch list).
2. Within 7 days after receipt of request for Substantial Completion, Engineer will make inspection to determine whether Work or designated portion is substantially complete.
3. Should Engineer determine that Work is not substantially complete:
 - a. Engineer will promptly notify Contractor in writing, stating reasons for its opinion.
 - b. Contractor shall remedy deficiencies in Work and send second written request for Substantial Completion to Engineer.
 - c. Engineer will reinspect Work.
 - d. Redo and Inspection of Deficient Work: Repeated until Work passes Engineer inspection.
4. When Engineer finds that Work is substantially complete, Engineer will:
 - a. Prepare Certificate of Substantial Completion, accompanied by Contractor's list of items to be completed or corrected as verified and amended by Engineer and Owner (final punch list).
 - b. Submit Certificate to Owner and Contractor for their written acceptance of responsibilities assigned to them in Certificate.
5. After Work is substantially complete, Contractor shall:
 - a. Allow Owner occupancy of Project under provisions stated in Certificate of Substantial Completion.
 - b. Complete Work listed for completion or correction within time period stipulated.
6. Owner will occupy all portions of building as specified in Section 011000 - Summary.

C. Prerequisites for Final Completion: Complete following items before requesting final acceptance and final payment.

1. When Contractor considers Work to be complete, submit written certification that:

- a. Contract Documents have been reviewed.
 - b. Work has been examined for compliance with Contract Documents.
 - c. Work has been completed according to Contract Documents.
 - d. Work is completed and ready for final inspection.
- 2. Submittals: Submit following:
 - a. Final punch list indicating all items have been completed or corrected.
 - b. Final payment request with final releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
 - c. Specified warranties, workmanship/maintenance bonds, maintenance agreements, and other similar documents.
 - d. Accounting statement for final changes to Contract Sum.
 - e. Contractor's affidavit of payment of debts and claims.
 - f. Contractor affidavit of release of liens.
 - g. Consent of surety to final payment.
- 3. Perform final cleaning for Contractor-soiled areas according to this Section.

D. Final Completion Inspection:

- 1. Within 7 days after receipt of request for final inspection, Engineer will make inspection to determine whether Work or designated portion is complete.
- 2. Should Engineer consider Work to be incomplete or defective:
 - a. Engineer will promptly notify Contractor in writing, listing incomplete or defective Work.
 - b. Contractor shall remedy stated deficiencies and send second written request to Engineer that Work is complete.
 - c. Engineer will reinspect Work.
 - d. Redo and Inspection of Deficient Work: Repeated until Work passes Engineer's inspection.

1.4 STARTING OF SYSTEMS

- A. Coordinate schedule for startup of various equipment and systems.
- B. Notify Engineer 7 days prior to startup of each item.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions which may cause damage.
- D. Verify that tests, meter readings, and electrical characteristics agree with those required by equipment or system manufacturer.
- E. Verify that wiring and support components for equipment are complete and tested.
- F. Execute startup under supervision of manufacturer's representative or Contractors' personnel according to manufacturer's instructions.

- G. When specified in individual Specification Sections, require manufacturer to provide authorized representative who will be present at Site to inspect, check, and approve equipment or system installation prior to startup and will supervise placing equipment or system in operation.
- H. Submit a written report according to Section 013300 - Submittal Procedures that equipment or system has been properly installed and is functioning correctly.

1.5 DEMONSTRATION AND INSTRUCTIONS

- A. Demonstrate operation and maintenance of products to Engineer when the Work is 80 percent complete.
- B. Demonstrate Project equipment and instruct in classroom environment by authorized manufacturer's representative who is knowledgeable about the Project.
- C. Video Recordings: Provide high-quality color video recordings of demonstration and instructional sessions. Engage commercial videographer to record sessions. Include classroom instructions, demonstrations, board diagrams, and other visual aids. Include menu navigation.
- D. For equipment or systems requiring seasonal operation, perform demonstration for other season within three months.
- E. Use operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.
- F. Demonstrate startup, operation, control, adjustment, troubleshooting, servicing, maintenance, and shutdown of each item of equipment at agreed time and location.
- G. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.
- H. Required instruction time for each item of equipment and system is specified in individual Specification Sections.

1.6 TESTING, ADJUSTING, AND BALANCING

- A. Contractor will appoint, employ, and pay for services of independent firm to perform testing, adjusting, and balancing.
- B. Independent firm will perform services specified.
- C. Reports will be submitted by independent firm to Engineer indicating observations and results of tests and indicating compliance or noncompliance with requirements of Contract Documents.

1.7 PROJECT RECORD DOCUMENTS

- A. Maintain on Site one set of the following record documents; record actual revisions to the Work:
 - 1. Drawings.

2. Specifications.
 3. Addenda.
 4. Change Orders and other modifications to the Contract.
 5. Reviewed Shop Drawings, product data, and Samples.
 6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress, not less than weekly.
- E. Specifications: Legibly mark and record, at each product Section, description of actual products installed, including the following:
1. Manufacturer's name and product model and number.
 2. Product substitutions or alternates used.
 3. Changes made by Addenda and modifications.
- F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction as follows:
1. Include Contract modifications such as Addenda, supplementary instructions, change directives, field orders, minor changes in the Work, and change orders.
 2. Include locations of concealed elements of the Work.
 3. Identify depth of buried utility lines and provide dimensions showing distances from permanent facility components that are parallel to utilities.
 4. Dimension ends, corners, and junctions of buried utilities to permanent facility components using triangulation.
 5. Identify and locate existing buried or concealed items encountered during Project.
 6. Measured depths of foundations in relation to finish first floor datum.
 7. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 8. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 9. Field changes of dimension and detail.
 10. Details not on original Drawings
- G. Contractor shall employ the services of Professional Land Surveyor registered in the State of Georgia to survey the final locations and elevations of the new infrastructure. Record drawings shall be sealed and signed by the Professional Land Surveyor and should include the following: all street names, right-of-way widths, easements, lot numbers and addresses, location/material/size of all sanitary sewer and drinking water infrastructure, manhole locations/rim elevations/invert elevations, valve locations, fire hydrant locations, fitting locations, water meter locations, benchmark information. "RECORD DRAWINGS" shall be printed in bold on the final documents provided to the Owner. Contractor shall provide Owner with two (2) hard copies of the record drawings and a thumb drive containing the record drawings in .DWG and .PDF format along with a .TXT file containing coordinates for the points surveyed.

1.8 OPERATION AND MAINTENANCE DATA

- A. Submit in PDF composite electronic indexed file.
- B. Submit data bound in 8-1/2 x 11-inch text pages, three D side ring capacity expansion binders with durable plastic covers.
- C. Prepare binder cover with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS," title of Project, and subject matter of binder when multiple binders are required.
- D. Internally subdivide binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.
- E. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- F. Contents: Prepare table of contents for each volume, with each product or system description identified, typed on white paper, in three parts as follows:
 - 1. Part 1: Directory, listing names, addresses, and telephone numbers of Engineer, Contractor, Subcontractors, and major equipment suppliers.
 - 2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by Specification Section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Include the following:
 - a. Significant design criteria.
 - b. List of equipment.
 - c. Parts list for each component.
 - d. Operating instructions.
 - e. Maintenance instructions for equipment and systems.
 - f. Maintenance instructions for finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
 - g. Safety precautions to be taken when operating and maintaining or working near equipment.
 - 3. Part 3: Project documents and certificates, including the following:
 - a. Shop Drawings and product data.
 - b. Air and water balance reports.
 - c. Certificates.
 - d. Originals of warranties and bonds.

1.9 MANUAL FOR MATERIALS AND FINISHES

- A. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Engineer will review draft and return one copy with comments.
- B. For equipment or component parts of equipment put into service during construction and operated by Owner, submit documents within ten days after acceptance.

- C. Submit one copy of completed volumes before Substantial Completion. Draft copy be reviewed and returned after Substantial Completion, with Engineer comments. Revise content of document sets as required prior to final submission.
- D. Submit two sets of revised final volumes within ten days after final inspection.
- E. Submit in PDF composite electronic indexed file of final manual within ten days after final inspection.
- F. Building Products, Applied Materials, and Finishes: Include product data, with catalog number, size, composition, and color and texture designations. Include information for re-ordering custom-manufactured products.
- G. Instructions for Care and Maintenance: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- H. Moisture Protection and Weather Exposed Products: Include product data listing applicable reference standards, chemical composition, and details of installation. Include recommendations for inspections, maintenance, and repair.
- I. Additional Requirements: As specified in individual product Specification Sections.
- J. Include listing in table of contents for design data, with tabbed fly sheet and space for insertion of data.

1.10 MANUAL FOR EQUIPMENT AND SYSTEMS

- A. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Engineer will review draft and return one copy with comments.
- B. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit documents within ten days after acceptance.
- C. Submit one copy of completed volumes before Substantial Completion Draft copy will be reviewed and returned after Substantial Completion, with Engineer comments. Revise content of document sets as required prior to final submission.
- D. Submit two sets of revised final volumes within ten days after final inspection.
- E. Submit in PDF composite electronic indexed file of final manual within ten days after final inspection.
- F. Each Item of Equipment and Each System: Include description of unit or system and component parts. Identify function, normal operating characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and model number of replaceable parts.
- G. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications.

- H. Include color-coded wiring diagrams as installed.
- I. Operating Procedures: Include startup, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shutdown, and emergency instructions. Include summer, winter, and special operating instructions.
- J. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- K. Include servicing and lubrication schedule and list of lubricants required.
- L. Include manufacturer's printed operation and maintenance instructions.
- M. Include sequence of operation by controls manufacturer.
- N. Include original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- O. Include control diagrams by controls manufacturer as installed.
- P. Include Contractor's coordination drawings with color-coded piping diagrams as installed.
- Q. Include charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- R. Include list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- S. Include test and balancing reports as specified in Section 014000 - Quality Requirements.
- T. Additional Requirements: As specified in individual product Specification Sections.
- U. Include listing in table of contents for design data with tabbed dividers and space for insertion of data.

1.11 SPARE PARTS AND MAINTENANCE PRODUCTS

- A. Furnish spare parts, maintenance, and extra products in quantities specified in individual Specification Sections.
- B. Deliver to place in location as directed by Engineer; obtain receipt prior to final payment.

1.12 PRODUCT WARRANTIES AND PRODUCT BONDS

- A. Obtain warranties and bonds executed in duplicate by responsible Subcontractors, suppliers, and manufacturers within ten days after completion of applicable item of Work.
- B. Execute and assemble transferable warranty documents and bonds from Subcontractors, suppliers, and manufacturers.

- C. Verify documents are in proper form, contain full information, and are notarized.
- D. Co-execute submittals when required.
- E. Include table of contents and assemble in three D side ring binder with durable plastic cover.
- F. Submit prior to final Application for Payment.
- G. Time of Submittals:
 - 1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten days after acceptance.
 - 2. Make other submittals within ten days after date of Substantial Completion, prior to final Application for Payment.
 - 3. For items of Work for which acceptance is delayed beyond Substantial Completion, submit within ten days after acceptance, listing date of acceptance as beginning of warranty or bond period.

1.13 MAINTENANCE SERVICE

- A. Furnish service and maintenance of components indicated in Specification Sections during warranty period.
- B. Examine system components at frequency consistent with reliable operation. Clean, adjust, and lubricate as required.
- C. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by manufacturer of original component.
- D. Do not assign or transfer maintenance service to agent or Subcontractor without prior written consent of Owner.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that existing Site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural support or attachment of new Work being applied or attached.
- C. Examine and verify specific conditions described in individual Specification Sections.
- D. Verify that utility services are available with correct characteristics and in correct locations.

3.2 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance according to manufacturer's instructions.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer-required or -recommended substrate primer, sealer, or conditioner prior to applying new material or substance in contact or bond.

3.3 EXECUTION

- A. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- B. When manufacturer's installation instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- C. Verify that field measurements are as indicated on approved Shop Drawings or as instructed by manufacturer.
- D. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.
 - 1. Secure Work true to line and level and within specified tolerances, or if not specified, industry-recognized tolerances.
 - 2. Physically separate products in place, provide electrical insulation, or provide protective coatings to prevent galvanic action or corrosion between dissimilar metals.
 - 3. Exposed Joints: Provide uniform joint width and arrange to obtain best visual effect. Refer questionable visual-effect choices to Engineer for final decision.
- E. Allow for expansion of materials and building movement.
- F. Climatic Conditions and Project Status: Install each unit of Work under conditions to ensure best possible results in coordination with entire Project.
 - 1. Isolate each unit of Work from incompatible Work as necessary to prevent deterioration.
 - 2. Coordinate enclosure of Work with required inspections and tests to minimize necessity of uncovering Work for those purposes.
- G. Mounting Heights: Where not indicated, mount individual units of Work at industry recognized standard mounting heights for particular application indicated.
 - 1. Refer questionable mounting heights choices to Engineer for final decision.
 - 2. Elements Identified as Accessible to Handicapped: Comply with applicable codes and regulations.
- H. Adjust operating products and equipment to ensure smooth and unhindered operation.

- I. Clean and perform maintenance on installed Work as frequently as necessary through remainder of construction period. Lubricate operable components as recommended by manufacturer.

3.4 CUTTING AND PATCHING

- A. Employ skilled and experienced installers to perform cutting and patching.
- B. Submit written request in advance of cutting or altering elements affecting:
 - 1. Structural integrity of element.
 - 2. Integrity of weather-exposed or moisture-resistant elements.
 - 3. Efficiency, maintenance, or safety of element.
 - 4. Visual qualities of sight-exposed elements.
 - 5. Work of Owner or separate contractor.
- C. Execute cutting, fitting, and patching including excavation and fill to complete Work and to:
 - 1. Fit the several parts together, to integrate with other Work.
 - 2. Uncover Work to install or correct ill-timed Work.
 - 3. Remove and replace defective and nonconforming Work.
 - 4. Remove samples of installed Work for testing.
 - 5. Provide openings in elements of Work for penetrations of mechanical and electrical Work.
- D. Execute Work by methods to avoid damage to other Work and to provide proper surfaces to receive patching and finishing.
- E. Cut masonry and concrete materials using masonry saw or core drill.
- F. Restore Work with new products according to requirements of Contract Documents.
- G. Fit Work tight to pipes, sleeves, ducts, conduits, and other penetrations through surfaces.
- H. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.
- I. At penetrations of fire-rated walls, partitions, ceiling, or floor construction, completely seal voids with fire-rated material to full thickness of penetrated element.
- J. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for assembly, refinish entire unit.
- K. Identify hazardous substances or conditions exposed during the Work to Engineer for decision or remedy.

3.5 PROTECTING INSTALLED CONSTRUCTION

- A. Protect installed Work and provide special protection where specified in individual Specification Sections.
- B. Provide temporary and removable protection for installed products. Control activity in immediate Work area to prevent damage.

- C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- D. Use durable sheet materials to protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects.
- E. Prohibit traffic or storage upon waterproofed or roofed surfaces. When traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- F. Prohibit traffic from landscaped areas.

3.6 FINAL CLEANING

- A. Execute final cleaning prior to final Project assessment.
 - 1. Employ experienced personnel or professional cleaning firm.
- B. Clean interior and exterior glass and surfaces exposed to view; remove temporary labels, stains, and foreign substances; polish transparent and glossy surfaces.
- C. Clean equipment and fixtures to sanitary condition with appropriate cleaning materials.
- D. Replace filters of operating equipment.
- E. Clean debris from roofs, gutters, downspouts, and drainage systems.
- F. Clean Site; sweep paved areas, rake clean landscaped surfaces.
- G. Remove waste and surplus materials, rubbish, and construction facilities from Site.

END OF SECTION 017000

**SECTION 017123
CONSTRUCTION LAYOUT**

PART 1 - GENERAL

1.1 SCOPE

- A. Construction staking shall include all of the surveying work required to layout the work and control the location of the finished Project. The Contractor shall have the full responsibility for constructing the Project to the correct horizontal and vertical alignment, as shown on the Drawings, as specified, or as ordered by the Engineer. The Contractor shall assume all costs associated with rectifying work constructed in the wrong location.
- B. From the information shown on the Drawings and the information to be provided as indicated under Project Conditions below, the Contractor shall:
 - 1. Be responsible for setting reference points and/or offsets, establishment of baselines, and all other layout, staking, and all other surveying required for the construction of the Project.
 - 2. Safeguard all reference points, stakes, grade marks, horizontal and vertical control points, and shall bear the cost of re-establishing same if disturbed.
 - 3. Stake out the permanent and temporary easements or the limits of construction to ensure that the work is not deviating from the indicated limits.
 - 4. Be responsible for all damage done to reference points, baselines, center lines and temporary bench marks, and shall be responsible for the cost of re-establishment of reference points, baselines, center lines and temporary bench marks as a result of the operations.
- C. Baselines shall be defined as the line to which the location of the work is referenced, i.e., edge of pavement, road centerline, property line, right-of-way or survey line.
- D. Record Drawing surveys shall be performed in accordance with Section 017000 of these Specifications.

1.2 PROJECT CONDITIONS

- A. The Drawings provide the location and/or coordinates of principal components of the Project. The alignment of some components of the Project may be indicated in the Specifications. The Engineer may order changes to the location of some of the components of the Project or provide clarification to questions regarding the correct alignment.
- B. The survey points, control points, and baseline to be provided to the Contractor shall be limited to only that information which can be found on the Project site by the Contractor.

1.3 QUALITY ASSURANCE

- A. The Contractor shall furnish documentation, prepared by a surveyor currently registered in the State in which the Project is located, confirming that staking is being done to the horizontal and vertical alignment shown in the Contract Documents. This requires that the Contractor hire, at the Contractor's own expense, a currently registered surveyor, acceptable to the Owner, to provide ongoing construction staking or confirmation of such.
- B. Any deviations from the Drawings shall be confirmed by the Engineer prior to construction of that portion of the Project.

1.4 PRESSURE MAINS AND ACCESSORIES

- A. Staking Precision: The precision of construction staking required shall be that which the correct location of the main can be established for construction and verified by the Engineer. Where the location of components of the main, e.g. fittings, valves, road crossings and are not dimensioned, the establishment of the location of these components shall be based upon scaling these locations from the Drawings with relation to readily identifiable land marks, e.g., survey reference points, power poles, manholes, etc.
- B. Reference Points
 - 1. Reference points shall be placed, at or no more than three feet, from the outside of the construction easement or right-of-way. The location of the reference points shall be recorded in a log with a copy provided to the Engineer for use, prior to verifying reference point locations. Distances shall be accurately measured to 0.01 foot.
 - 2. The Contractor shall give the Engineer reasonable notice that reference points are set. The reference point locations must be verified by the Engineer prior to commencing clearing and grubbing operations.

1.5 GRAVITY MAINS AND ACCESSORIES

- A. Staking Precision: The precision of construction staking required shall be that which the correct location of the main can be established for construction and verified by the Engineer. Where the location of components of the main, e.g. manholes, connections, cleanouts, road crossings are not dimensioned, the establishment of the location of these components shall be based upon scaling these locations from the Drawings with relation to readily identifiable land marks, e.g., survey reference points, power poles, manholes, etc.
- B. Reference Points
 - 1. Reference points shall be placed, at or no more than three feet, from the outside of the construction easement or right-of-way. The location of the reference points shall be recorded in a log with a copy provided to the Engineer for use, prior to verifying reference point locations. Distances shall be accurately measured to 0.01 foot.

2. The Contractor shall give the Engineer reasonable notice that reference points are set. The reference point locations must be verified by the Engineer prior to commencing clearing and grubbing operations.

END OF SECTION 017123

SECTION 017400
CLEANING AND WASTE MANAGEMENT

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Section includes requirements for cleanup, re-stabilization, restoration, and disposal to maintain a safe and well-kept job site and properly repair disturbed areas.

1.2 QUALITY ASSURANCE

- A. Daily, and more often if necessary, conduct inspections verifying that requirements of cleanliness are being met.
- B. In addition to the standards described in this Section, comply with all pertinent requirements of governmental agencies having jurisdiction.

1.3 CLEANING MATERIALS AND EQUIPMENT

- A. Provide all required personnel, equipment and materials needed to maintain the specified standard of cleanliness.
- B. Use only the cleaning materials, methods and equipment which are compatible with the surface being cleaned, as recommended by the manufacturer of the material or as approved by the Engineer.

1.4 CLEANING DURING CONSTRUCTION

- A. Throughout all phases of construction, including suspension of work, and until the Final Acceptance, the Contractor shall keep the site clean and free from rubbish and debris. The Contractor shall also abate dust nuisance by cleaning, sweeping and sprinkling with water, or other means as necessary. The use of water resulting in mud on driveways, parking lots or streets will not be permitted as a substitute for sweeping or other methods.
 - 1. Vehicles exiting the construction site shall have all dirt clods and mud removed from their tires.
 - 2. Materials and equipment shall be removed from the site as soon as they are no longer necessary. Before the final inspection, the site shall be cleared of equipment, unused materials and rubbish so as to present a satisfactory clean and neat appearance. All cleanup costs shall be included in the Contractor's Bid.
- B. Failure of the Contractor to comply with the Engineer's cleanup orders may result in an order to suspend work until the condition is corrected. No additional compensation will be allowed as a result of such suspension.

1.5 FINAL CLEANING

- A. Upon completion of the work, the Contractor shall remove from the site all plant, materials, tools and equipment belonging to him, and leave the site with an appearance acceptable to the Owner.
- B. Thoroughly clean all equipment and materials installed and deliver over such materials and equipment in a bright, clean, polished and new appearing condition.
- C. Restore or replace all landscape features scarred or damaged by the Contractor's equipment or operations as nearly as possible to original condition, at the Contractor's expense. The Owner will approve the method of restoration to be used.
- D. The Contractor shall remove all signs of temporary construction facilities such as haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess or waste materials, or any other vestiges of construction, as directed by the Owner. It is anticipated that excavation, filling and plowing of roadways will be required to restore the area to near natural conditions which will permit the growth of vegetation thereon. The restored areas shall be filled, graded, and spread with sufficient topsoil to provide a minimum depth of four inches of suitable soil for the growth of grass, and the entire area shall be seeded or sodded with the original type of grass. Areas shall be restored to original contours as shown on the Plans. If the Plans do not cover the specific areas to be restored, the areas shall be graded to drain and give a smooth transition to the surroundings.

1.6 MEASUREMENT AND PAYMENT

- A. No separate payment will be made for any items of work, materials, parts, equipment, supplies, or related items required to perform and complete the requirements of this section. The costs for all such items required shall be considered subsidiary to other items of this Contract and shall not be paid for separately.

1.7 DISPOSAL OF WASTE

- A. The definitions contained in Georgia Environmental Protection Division Rules 391-3- 4-.01 shall be applicable to this Project. The term waste shall include excess and surplus materials, and shall include liquid and solid wastes.
- B. Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
- C. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
- D. Remove and transport waste in a manner that will prevent spillage on adjacent surfaces and areas.
- E. Burning: Do not burn waste materials on site.

- F. Waste removed from the Project site shall be disposed of in sites permitted by the Georgia Environmental Protection Division for the acceptance of type of waste being disposed. The acceptable types of permitted disposal facilities are as follows:
1. Inert Waste Landfills
 2. Municipal Solid Waste Landfills
 3. Municipal Solid Waste Landfills permitted to receive only construction and demolition wastes.
- G. Exceptions to Paragraph F are as follows:
1. Hazardous waste shall be disposed of in accordance with Georgia Environmental Protection Division Rules 391-3-11.
 2. Asbestos-containing waste shall also be handled and disposed of in accordance with Georgia Environmental Protection Division Rules 391-3-14.
 3. Excess earth material and excess excavated rock material may be placed on sites for which the Contractor provides to the Owner a signed affidavit from the property owner that the placement of such material is acceptable to the property owner. The Contractor and property owner shall be responsible for all permitting of such disposal.
- H. No waste shall be placed at a transfer station facility.
- I. The Contractor shall maintain records related to all waste removed from the Project site so as to allow the Owner or the Engineer to readily determine the following:
1. Date waste removed from Project site.
 2. Name of hauler (company and driver) transporting such waste.
 3. General description of waste transported.
 4. "Truck tickets" indicating the waste disposal site and amount of waste disposed therein.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 017400

SECTION 017836 WARRANTIES

PART 1 - GENERAL

1.1 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 all work for a period of time as stated in the General Conditions. The Owner will give notice of observed defects with reasonable promptness.
- 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 Correction Period described in the General Conditions, 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 warranty and Correction Period, as described in the General Conditions, 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 from the date of reassembly.
- 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 the duration of the Correction Period, as defined in the General Conditions. 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.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 017836

SECTION 034100
PRECAST STRUCTURAL CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Columns and bearing saddles.
2. Beams.
3. Spandrels.
4. Girders.
5. Purlins.
6. Floor tees.
7. Channel slabs.
8. Inverted tee beam.
9. Grout packing.
10. Connection and supporting devices.
11. Lintels.
12. Bond beams.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. Section 012000 - Price and Payment Procedures: Contract Sum/Price modification procedures.

1.3 REFERENCE STANDARDS

A. American Concrete Institute:

1. ACI 301 - Specifications for Structural Concrete.
2. ACI 318 - Building Code Requirements for Structural Concrete.

B. American Welding Society:

1. AWS B2.1 - Specification for Welding Procedure and Performance Qualification.
2. AWS D1.1 - Structural Welding Code - Steel.
3. AWS D1.4 - Structural Welding Code - Reinforcing Steel.

C. ASTM International:

1. ASTM A36 - Standard Specification for Carbon Structural Steel.
2. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
3. ASTM A416 - Standard Specification for Steel Strand, Uncoated Seven-Wire for Prestressed Concrete.
4. ASTM A615 - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.

5. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
6. ASTM A706 - Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.
7. ASTM A1064 - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
8. ASTM C31 - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
9. ASTM C143 - Standard Test Method for Slump of Hydraulic-Cement Concrete.
10. ASTM C150 - Standard Specification for Portland Cement.
11. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
12. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.

D. Precast/Prestressed Concrete Institute:

1. PCI MNL-116 - Manual for Quality Control for Plants and Production of Structural Precast Concrete Products.
2. PCI MNL-120 - PCI Design Handbook: Precast and Prestressed Concrete.
3. PCI MNL-123 - Design and Typical Details of Connections for Precast and Prestressed Concrete.
4. PCI MNL-124 - Design for Fire Resistance of Precast/Prestressed Concrete.

E. UL:

1. Fire Resistance Directory.

1.4 **COORDINATION**

- A. Section 013000 - Administrative Requirements: Requirements for coordination.
- B. Coordinate Work of this Section with framing components not pre-tensioned but associated with Work of this Section.
- C. Coordinate cutting of required openings 10 inches and smaller.

1.5 **PREINSTALLATION MEETINGS**

- A. Section 013000 - Administrative Requirements: Requirements for preinstallation meeting.
- B. Convene minimum one week prior to commencing Work of this Section.

1.6 **SUBMITTALS**

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit standard component configurations, design loads, deflections, cambers, and bearing requirements.

- C. Shop Drawings: Indicate layout, unit locations, fabrication details, unit identification marks, reinforcement, connection details, support items, dimensions, openings, and relationship to adjacent materials.
- D. Fabricator's Certificate: Certify that products meet or exceed specified requirements.
- E. Welder Certificates: Certify welders and welding procedures employed on Work, verifying AWS qualification within previous 12 months.
- F. Delegated Design Submittals: Submit Shop Drawings signed and sealed by a Professional Engineer with design calculations and assumptions for loadings and stresses of fabricated and designed framing and connections.
- G. Fabricator Instructions: Submit special procedures, perimeter conditions requiring special attention.
- H. Source Quality-Control Submittals: Indicate results of shop factory tests and inspections.
- I. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
- J. Qualifications Statements:
 - 1. Submit qualifications for fabricator, erector, and licensed professional.
 - 2. Welders: Qualify procedures and personnel according to AWS D1.1, AWS B2.1, and AWS D1.4.

1.7 SUSTAINABLE DESIGN SUBMITTALS – (NOT USED)

- A. Section 018113 - Sustainable Design Requirements: Requirements for sustainable design submittals.
- B. Manufacturer's Certificate: Certify that following products meet or exceed specified sustainable design requirements:
 - 1. Materials Resources Certificates:
 - a. Certify recycled material content for recycled content products.
 - b. Certify source for regional materials and distance from Project Site.
- C. Product Cost Data: Submit cost of products to verify compliance with Project sustainable design requirements. Exclude cost of labor and equipment to install products.
 - 1. Provide cost data for following products:
 - a. Products with recycled material content.
 - b. Regional products.

1.8 QUALITY ASSURANCE

- A. Comply with PCI MNL-116, PCI MNL-123, and PCI MNL-120.

- B. Fire-Rated Construction – **(NOT USED)**
- C. Surface-Burning Characteristics:
 - 1. Foam Insulation: Maximum 75/450 flame-spread/smoke-developed index when tested according to ASTM E84.
 - 2. Other Insulation: Maximum 25/450 flame-spread/smoke-developed index when tested according to ASTM E84.
- D. Apply label from agency approved by authorities having jurisdiction to identify each foam plastic insulation board.
- E. Perform Work according to Owner and current industry standards.
- F. Maintain one copy of each standard affecting Work of this Section on Site.

1.9 QUALIFICATIONS

- A. Fabricator: Company specializing in fabricating products specified in this Section with minimum three years' experience.
- B. Erector: Company specializing in performing Work of this Section with minimum three years' documented experience and approved by manufacturer.
- C. Welders: ASME qualified within previous 12 months for employed weld types.
- D. Licensed Professional: Professional engineer experienced in design of specified Work and licensed in State of Georgia.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Store materials according to manufacturer instructions.
- D. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.
 - 3. Protect members to prevent staining, chipping, or spalling of concrete.
- E. Handling:
 - 1. Handle precast members in position consistent with their shape and design.
 - 2. Lift and support only from designated support points.

3. Lifting or Handling Devices: Capable of supporting member in positions anticipated during manufacture, storage, transportation, and erection.
4. Mark each member with date of production and final position in structure.

PART 2 - PRODUCTS

2.1 PERFORMANCE AND DESIGN CRITERIA

- A. Size components to withstand design loads in a restrained and unrestrained condition as follows:
 1. Horizontal Assembly: Meet Georgia Department of Transportation standards for similar applications for psf live and dead loads.
 2. Vertical Assembly: Meet Georgia Department of Transportation standards for similar applications for psf.
- B. Maximum Allowable Deflection: Meet Georgia Department of Transportation standards for similar applications
- C. Seismic Design: Design and detail elements and connections to resist seismic force according to industry requirements and ACI 318 for following: - **(NOT USED)**
- D. Design members exposed to weather to allow movement of components without damage, failure of joint seals, undue stress on fasteners, or other detrimental effects when subject to seasonal or cyclic day/night temperature ranges.
- E. Design system to accommodate construction tolerances, deflection of other building structural members, and clearances of intended openings.
- F. Calculate structural properties of framing members according to ACI 301 & 318.

2.2 FABRICATORS AND MANUFACTURERS

- A. Fabricators:
 1. Fabricators will furnish materials according to Owner and/or Georgia Department of Transportation standards
- B. Manufacturers:
 1. Manufacturers will be experienced with similar work according to Owner and/or Georgia Department of Transportation standards.

2.3 SUSTAINABILITY CHARACTERISTICS – (NOT USED)

- A. Section 018113 - Sustainable Design Requirements: Requirements for sustainable design compliance.
- B. Material and Resource Characteristics:

1. Recycled Content Materials: Furnish materials with maximum available recycled content.
2. Regional Materials: Furnish materials extracted, processed, and manufactured within 500 miles of Project Site.

2.4 MATERIALS

A. Cement:

1. Comply with ASTM C150, Type I or III depending on suitable application.
2. Type: Portland.
3. Color: Meet Owner standards and/or preferences.

B. Aggregate, Sand, Water, Admixtures:

1. As determined by precast fabricator.
2. As appropriate to design requirements.

C. Reinforcement:

1. Tensioning Steel Tendons:

- a. Comply with ASTM A416, Grade 250k or 270k depending on suitable application.
- b. Strength: Commensurate with member design.

2. Deformed Reinforcement:

- a. Description: Steel bars.
- b. Comply with ASTM A615 or A706, Grade 40 or 60 depending on suitable application.

3. Welded Steel Wire Fabric:

- a. Type: Plain.
- b. Comply with ASTM A1064.
- c. Configuration: Meet Georgia Department of Transportation standards.
- d. Finish: Meet Georgia Department of Transportation standards.

4. Coating: Galvanize or Epoxy coat as specified in Section 099000 - Painting and Coating to resist corrosion.

2.5 FABRICATION

A. Comply with PCI MNL-116 and ACI 318.

B. Maintain plant records and quality-control program during production of precast members, and make records available upon request of Architect/Engineer.

C. Ensure that reinforcing steel, anchors, inserts, plates, angles, and other cast items are embedded and located as indicated on Drawings.

- D. Tension Reinforcement Tendons: As required to achieve design load criteria.
- E. Fabricate required openings larger than 8 inches.
- F. Embed accessories provided by other Sections at indicated locations.
- G. Exposed Ends at Stressing Tendons: Fill recess with nonshrink epoxy grout and trowel flush.
- H. Welding:
 - 1. Steel Fabrications: Comply with AWS D1.1.
 - 2. Reinforcing Steel: Comply with AWS D1.4.
 - 3. Do not tack-weld reinforcing.
- I. Tolerances:
 - 1. Comply with PCI MNL-116.

2.6 FINISHES

- A. Exposed-to-View Finished Surfaces of Precast Concrete Members: Uniform in color and appearance.
- B. Curing:
 - 1. Cure members under identical conditions to develop required concrete quality.
 - 2. Minimize appearance blemishes including nonuniformity, staining, and surface cracking.
- C. Finish members to PCI MNL-116, grade meeting Georgia Department of Transportation.

2.7 ACCESSORIES

- A. Connecting and Supporting Devices:
 - 1. Materials: Meeting Georgia Department of Transportation standards.
 - 2. Plates, Angles, Inserts: Comply with PCI MNL-123.
 - 3. Finish: Meeting Georgia Department of Transportation.
 - 4. Do not paint surfaces in contact with concrete or surfaces requiring field welding.
- B. Grout:
 - 1. Type:
 - a. Nonshrink.
 - b. Thermosetting epoxy.
 - 2. Minimum Compressive Strength: 10,000 psi at 28 days.
- C. Bearing Pads:

1. Material: Meet Georgia Department of Transportation standards.
 2. Thickness: 1/8 inch.
 3. Finish: Smooth both sides.
 4. Hardness: Shore A Durometer.
- D. Bolts, Nuts, and Washers: Corrosion-resistant chromium-nickel.
- E. Prime Paint: Zinc-rich alkyd as specified in Section 099000 - Painting and Coating.

2.8 SOURCE QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Requirements for testing, inspection, and analysis.
- B. Testing:
1. Stressing Tendons: Comply with ASTM A416/A416M.
 2. Concrete:
 - a. Comply with PCI MNL-116.
 - b. Obtain 1 concrete test cylinders for every 10 cu. yd. of concrete placed according to ASTM C31.
 - c. Obtain slump tests for every set of test cylinders according to ASTM C143.
 - d. Take one air entrainment test for each set of exterior concrete test cylinders.
- C. Owner Inspection:
1. Make completed unit available for inspection at fabricator's factory prior to packaging for shipment.
 2. Notify Owner at least seven days before inspection is allowed.
- D. Owner Witnessing:
1. Allow witnessing of factory inspections and test at fabricator's test facility.
 2. Notify Owner at least seven days before inspections and tests are scheduled.
- E. Certificate of Compliance:
1. If fabricator is approved by authorities having jurisdiction, submit certificate of compliance indicating Work performed at fabricator's facility conforms to Contract Documents.
 2. Specified shop tests are not required for Work performed by approved fabricator.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.

- B. Verify that Site conditions are ready to receive Work.
- C. Verify that field measurements are as indicated on Drawings.

3.2 PREPARATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation preparation.
- B. Prepare support equipment for erection procedure, temporary bracing, and induced loads during erection.

3.3 ERECTION

- A. Erect members without damage to structural capacity, shape, or finish; replace or repair damaged members.
- B. Align and maintain uniform horizontal and vertical joints as erection progresses.
- C. Temporary Bracing and Support:
 - 1. Maintain in place until final support is provided.
 - 2. Protect members from staining.
 - 3. Provide temporary lateral support to prevent bowing, twisting, or warping of members.
- D. Adjust differential camber between precast members to tolerance before final attachment.
- E. Install bearing pads.
- F. Level differential elevation of adjoining horizontal members with grout to maximum slope of 1:12.
- G. Set vertical units dry, without grout, and attain joint dimensions with lead or plastic spacers.
- H. Grout:
 - 1. Underside of column and beam bearing plates.
 - 2. Joints between members at roof and floor locations.
- I. Welding:
 - 1. Comply with AWS D1.1 and AWS D1.4.
 - 2. Do not tack-weld reinforcing.

3.4 TOLERANCES

- A. Section 014000 - Quality Requirements: Requirements for tolerances.
- B. Erect members level and plumb within allowable tolerances.

- C. Comply with PCI MNL-116.
- D. Noncompliance:
 - 1. If members cannot be adjusted to comply with design or tolerance criteria, cease Work and advise Engineer.
 - 2. Execute modifications as directed by Engineer.

3.5 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Requirements for inspecting and testing.
- B. Section 017000 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.
- C. Inspect welds according to AWS D1.1.

3.6 CLEANING

- A. Section 017000 - Execution and Closeout Requirements: Requirements for cleaning.
- B. Clean weld marks, dirt, or blemishes from surfaces of exposed members.

3.7 PROTECTION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for protecting finished Work.
- B. Protect members from damage caused by field welding or erection operations.
- C. Use noncombustible shields during welding operations to protect adjacent Work.

3.8 ATTACHMENTS

- A. N/A

END OF SECTION 034100

SECTION 036000 - GROUTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Portland cement grout.
2. Rapid-curing epoxy grout.
3. Nonshrink cementitious grout.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. Section 012000 - Price and Payment Procedures: Contract Sum/Price modification procedures.

1.3 REFERENCE STANDARDS

A. American Concrete Institute:

1. ACI 301 - Specifications for Structural Concrete for Buildings.
2. ACI 318 - Building Code Requirements for Structural Concrete.

B. ASTM International:

1. ASTM C33 - Standard Specification for Concrete Aggregates.
2. ASTM C40 - Standard Test Method for Organic Impurities in Fine Aggregates for Concrete.
3. ASTM C150 - Standard Specification for Portland Cement.
4. ASTM C191 - Standard Test Methods for Time of Setting of Hydraulic Cement by Vicat Needle.
5. ASTM C307 - Standard Test Method for Tensile Strength of Chemical-Resistant Mortar, Grouts, and Monolithic Surfacing.
6. ASTM C531 - Standard Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes.
7. ASTM C579 - Standard Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes.
8. ASTM C827 - Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens of Cementitious Mixtures.

C. U. S. Army Corps of Engineers Concrete Research Division (CRD):

1. CRD-C621 - Non-Shrink Grout.

1.4 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit manufacturer information regarding grout.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Manufacturer Instructions: Submit instructions for mixing, handling, surface preparation, and placing epoxy-type and nonshrink grouts.
- E. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
- F. Qualifications Statement:
 - 1. Submit qualifications for manufacturer.

1.5 SUSTAINABLE DESIGN SUBMITTALS – (NOT USED)

- A. Section 018113 - Sustainable Design Requirements: Requirements for sustainable design submittals.
- B. Manufacturer's Certificate:
 - 1. Certify that products meet or exceed specified sustainable design requirements.
 - 2. Materials Resources Certificates:
 - a. Certify recycled material content for recycled content products.
 - b. Certify source for regional materials and distance from Project Site.
- C. Product Cost Data: Submit cost of products to verify compliance with Project sustainable design requirements. Exclude cost of labor and equipment to install products.
 - 1. Provide cost data for following products:
 - a. Products with recycled material content.
 - b. Regional products.

1.6 QUALITY ASSURANCE

- A. Perform Work according to owner and current industry standards.
- B. Maintain one copy of each standard affecting Work of this Section on Site.

1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' experience.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Store materials according to manufacturer instructions.
- D. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

1.9 AMBIENT CONDITIONS

- A. Section 015000 - Temporary Facilities and Controls: Requirements for ambient condition control facilities for product storage and installation.
- B. Maximum Conditions: Do not perform grouting if temperatures exceed manufacturer recommendations.
- C. Minimum Conditions: Maintain minimum temperature per manufacturer recommendations before, during, and after grouting, until grout has set.

PART 2 - PRODUCTS

2.1 PORTLAND CEMENT GROUT

- A. Portland Cement: Comply with ASTM C150, Type I and II.
- B. Water:
 - 1. Potable.
 - 2. No impurities, suspended particles, algae, or dissolved natural salts in quantities capable of causing:
 - a. Corrosion of steel.
 - b. Volume change increasing shrinkage cracking.
 - c. Efflorescence.
 - d. Excess air entraining.
- C. Fine Aggregate:
 - 1. Washed natural sand.
 - 2. Gradation:

- a. Comply with ASTM C33.
 - b. Represented by smooth granulometric curve within required limits.
- 3. Free from injurious amounts of organic impurities according to ASTM C40.
- D. Mix:
 - 1. Portland cement, sand, and water.
 - 2. Do not use ferrous aggregate or staining ingredients in grout mixes.

2.2 RAPID-CURING EPOXY GROUT

- A. Manufacturers:
 - 1. Furnish materials according to municipal and current industry standards.
- B. Description:
 - 1. High-strength, three-component epoxy grout formulated with thermosetting resins and inert fillers.
 - 2. Rapid-curing, high adhesion, and resistant to ordinary chemicals, acids, and alkalis.
- C. Performance and Design Criteria:
 - 1. Compressive Strength:
 - a. 12,000 psi at seven days.
 - b. Comply with ASTM C579.
 - 2. Minimum Tensile Strength:
 - a. 2,000 psi.
 - b. Comply with ASTM C307.
 - 3. Coefficient of Expansion:
 - a. 30×10^{-6} inch per degree F.
 - b. Comply with ASTM C531.
 - 4. Shrinkage:
 - a. None.
 - b. Comply with ASTM C827.

2.3 NONSHRINK CEMENTITIOUS GROUT

- A. Manufacturers:
 - 1. Furnish materials according to municipal and current industry standards.
- B. Description:

1. Pre-mixed and ready-for-use formulation requiring only addition of water.
2. Nonshrink, non-corrosive, nonmetallic, non-gas forming, and no chlorides.

C. Performance and Design Criteria:

1. Certified to maintain initial placement volume or expand after set, and to meet following minimum properties when tested according to CRD-C621 for Type D nonshrink grout:
 - a. Setting Time:
 - 1) Initial: Approximately two hours.
 - 2) Final: Approximately three hours.
 - 3) Comply with ASTM C109 and with no shrinkage when tested in accordance with ASTM C827.
 - b. Maximum Expansion: 0.10 to 0.40 percent.
 - c. Compressive Strength:
 - 1) One-Day: 4,000 psi.
 - 2) Seven-Day: 7,000 psi.
 - 3) 28-Day: 10,000 to 10,800 psi.
 - 4) Comply with CRD-C621.

2.4 FORMWORK

- A. As specified in Section 031000 - Concrete Forming and Accessories.

2.5 SUSTAINABILITY CHARACTERISTIC– (NOT USED)

- A. Section 018113 - Sustainable Design Requirements: Requirements for sustainable design compliance.
- B. Material and Resource Characteristics:
1. Recycled Content Materials: Furnish materials with maximum available recycled content.
 2. Regional Materials: Furnish materials extracted, processed, and manufactured within 500 miles of Project.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.
- B. Verify areas to receive grout.

3.2 PREPARATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation preparation.
- B. Remove defective concrete, laitance, dirt, oil, grease, and other foreign material from concrete surfaces by brushing, hammering, chipping, or other similar means until sound and clean concrete surface is achieved.
- C. Roughen concrete lightly, but not to interfere with placement of grout.
- D. Remove foreign materials from metal surfaces in contact with grout.
- E. Align, level, and maintain final positioning of components to be grouted.
- F. Saturate concrete surfaces with clean water, and then remove excess water.

3.3 INSTALLATION

- A. Formwork:
 - 1. Construct leakproof forms anchored and shored to withstand grout pressures.
 - 2. Install formwork with clearances to permit proper placement of grout.
 - 3. As specified in Section 031000 - Concrete Forming and Accessories.
- B. Mixing:
 - 1. Portland Cement Grout:
 - a. Use proportions of two parts sand and one part cement, measured by volume.
 - b. Prepare grout with water to obtain consistency to permit placing and packing.
 - c. Mix water and grout in two steps:
 - 1) Premix using approximately 2/3 of water.
 - 2) After partial mixing, add remaining water to bring mix to desired placement consistency and continue mixing two to three minutes.
 - d. Mix only quantities of grout capable of being placed within 30 minutes after mixing.
 - e. Do not add additional water after grout has been mixed.
 - f. Minimum Compressive Strength: 2,400 psi in 48 hours and 7,000 psi in 28 days.
 - 2. Rapid-Curing Epoxy Grout:
 - a. Mix and prepare according to manufacturer instructions.
 - b. Minimum Compressive Strength: 2,400 psi in 48 hours and 7,000 psi in 28 days.
 - 3. Nonshrink Cementitious Grout:
 - a. Mix and prepare according to manufacturer instructions.
 - b. Minimum Compressive Strength: 2,400 psi in 48 hours and 7,000 psi in 28 days.

4. Mix grout components in proximity to Work area and transport mixture quickly and in manner not permitting segregation of materials.

C. Placing of Grout:

1. Place grout material quickly and continuously.
2. Do not use pneumatic-pressure or dry-packing methods.
3. Apply grout from one side only to avoid entrapping air.
4. Do not vibrate placed grout mixture or permit placement if area is being vibrated by nearby equipment.
5. Thoroughly compact final installation and eliminate air pockets.
6. Do not remove leveling shims for at least 48 hours after grout has been placed.

D. Curing:

1. Prevent rapid loss of water from grout during first 48 hours by use of approved membrane curing compound or by using wet burlap method.
2. Immediately after placement, protect grout from premature drying, excessively hot or cold temperatures, and mechanical injury.
3. After grout has attained its initial set, keep damp for minimum three days.

3.4 FIELD QUALITY CONTROL

A. Section 014000 - Quality Requirements: Requirements for inspecting and testing.

B. Section 017000 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.

C. Inspection and Testing:

1. Comply with ACI 301 and ACI 318 and as specified in Section 014000 - Quality Requirements.
2. Submit proposed mix design of each class of grout to Engineer of Record for review prior to commencement of Work.
3. Tests of grout components may be performed to ensure compliance with specified requirements.

END OF SECTION 036000

SECTION 310519.13 – GEOTEXTILES FOR EARTHWORK

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Nonwoven geotextile material.
2. Woven geotextile material.

B. Related Requirements:

1. Supplemental Specifications
 - a. Section 312500 – Erosion and Sedimentation Controls: Erosion and sedimentation control devices.
 - b. Section 313716.13 – Rubble-Stone Riprap: Riprap and rock lining used for soil stabilization and slope protection.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Section 012000 - Price and Payment Procedures.

1.3 REFERENCE STANDARDS

A. American Association of State Highway and Transportation Officials:

1. AASHTO M288 - Standard Specification for Geotextile Specification for Highway Applications.

B. ASTM International:

1. ASTM D435 - Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc Type Apparatus.
2. ASTM D4491 - Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
3. ASTM D4533 - Standard Test Method for Trapezoid Tearing Strength of Geotextiles.
4. ASTM D4632 - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
5. ASTM D4751 - Standard Test Method for Determining Apparent Opening Size of a Geotextile.
6. ASTM D4833 - Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products.
7. ASTM D4873 - Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples.

8. ASTM D4884 - Standard Test Method for Strength of Sewn or Bonded Seams of Geotextiles.
9. ASTM D4886 - Standard Test Method for Abrasion Resistance of Geotextiles (Sand Paper/Sliding Block Method).
10. ASTM D6524 - Standard Test Method for Measuring the Resiliency of Turf Reinforcement Mats (TRMs).
11. ASTM D6525 - Standard Test Method for Measuring Nominal Thickness of Rolled Erosion Control Products.
12. ASTM D6566 - Standard Test Method for Measuring Mass per Unit Area of Turf Reinforcement Mats.
13. ASTM D6567 - Standard Test Method for Measuring the Light Penetration of a Turf Reinforcement Mat (TRM).
14. ASTM D6575 - Standard Test Method for Determining Stiffness of Geosynthetics Used as Turf Reinforcement Mats (TRMs).
15. ASTM D6818 - Standard Test Method for Ultimate Tensile Properties of Rolled Erosion Control Products.

1.4 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit manufacturer information including tensile strength, elongation, thickness, UV resistance, and other material specifications.
- C. Shop Drawings: Indicate fabric layout, seam locations, and overlap details in installation drawings.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Manufacturer Instructions: Submit detailed instructions on installation requirements, including storage and handling procedures.
- F. Source Quality-Control Submittals: Indicate results of factory tests and inspections.
- G. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
- H. Qualifications Statements:
 1. Submit qualifications for manufacturer and installer.
 2. Submit manufacturer's approval of installer.

1.5 SUSTAINABLE DESIGN SUBMITTALS – (NOT USED)

1.6 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.
- B. Project Record Documents: Record actual locations of geotextile material, including placement depth.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for maintenance materials.

1.8 QUALITY ASSURANCE

- A. Perform Work according to Owner and current industry standards.
- B. Maintain one copy of each standard affecting Work of this Section on Site.

1.9 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' documented experience.
- B. Installer: Company specializing in performing Work of this Section with minimum three years' documented experience and approved by manufacturer.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Comply with ASTM D4873.
- D. Store materials according to manufacturer instructions.
- E. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

PART 2 - PRODUCTS

2.1 NONWOVEN GEOTEXTILE MATERIALS

- A. Manufacturers:
 - 1. Furnish materials according to Owner and current industry standards.
- B. Description:

1. Fibers used in the manufacture of geotextiles, and the threads used in joining geotextiles by sewing, shall consist of long-chain synthetic polymers.
2. Where the geotextile will be in contact with fresh concrete, polyester fabrics will not be permitted.
3. They shall be formed into a nonwoven network such that the filaments or yarns retain dimensional stability relative to each other, including selvages.
4. The geotextile shall be mildew and rot resistant, resistant to ultraviolet light exposure, insect and rodent resistant and inert to commonly encountered chemicals and hydrocarbons.
5. Heat bonded geotextiles will not be permitted.

C. Performance and Design Criteria:

1. Nominal Weight: 16 oz./sq. yd.
2. Apparent Opening Size:
 - a. No. 70 to No. 120 U.S. standard sieve size.
 - b. Comply with ASTM D4751.
3. Water Permittivity: Greater than or equal to 0.25cm per second.
4. Vertical Water Flow Rate:
 - a. Comply with ASTM D4491.
5. Tensile Strength:
 - a. 390 lbf, minimum average roll value.
 - b. Comply with ASTM D4632.
6. Elongation at Failure:
 - a. Greater than or equal to 50 percent, minimum average roll value.
 - b. Comply with ASTM D4632.
7. Trapezoidal Tear Strength:
 - a. 135 lbf, minimum average roll value.
 - b. Comply with ASTM D4533.
8. Puncture Strength:
 - a. Comply with ASTM D4833.
9. UV Resistance at 500 Hours:
 - a. Comply with ASTM D4355.

2.2 WOVEN GEOTEXTILE MATERIALS

A. Manufacturers:

1. Furnish woven geotextile materials in accordance with Owner requirements, AASHTO M288, and current industry standards.

B. Description:

1. Fibers used in the manufacture of geotextiles, and the threads used in joining geotextiles by sewing, shall consist of long-chain synthetic polymers composed of at least 95 percent polyolefins by weight.
2. The geotextile shall be manufactured from woven monofilament or slit-film yarns formed into a dimensionally stable network such that the yarns retain their relative position with respect to each other, including the selvages.
3. The geotextile shall be resistant to ultraviolet degradation, mildew, rot, insects, and commonly encountered soil chemicals.
4. The geotextile shall be free of defects, tears, punctures, flaws, or other imperfections that may adversely affect its performance.

C. Performance and Design Criteria:

1. Geotextile shall meet the requirements of AASHTO M288 for Separation and Stabilization Applications.
2. Grab Tensile Strength:
 - a. 200 lbs minimum average roll value.
 - b. Comply with ASTM D4632
3. Sewn Seam Strength:
 - a. Minimum 90 percent of specified grab tensile strength.
 - b. Comply with ASTM D4632.
4. Trapezoidal Tear Strength:
 - a. 75 lbs minimum average roll value.
 - b. Comply with ASTM D4533.
5. Pin Puncture Strength:
 - a. 90 lbs minimum average roll value.
 - b. Comply with ASTM D6241.

- 6. Apparent Opening Size (AOS):
 - a. Maximum No. 40 U.S. Standard Sieve.
 - b. Comply with ASTM D4751.
- 7. Water Permittivity:
 - a. Minimum 0.05 sec^{-1} .
 - b. Comply with ASTM D4491.
- 8. Ultraviolet Resistance:
 - a. Minimum 70 percent strength retained after 500 hours exposure.
 - b. Comply with ASTM D4355.

2.3 SOURCE QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Requirements for testing, inspection, and analysis.
- B. Provide shop inspection and testing of completed assembly.
- C. Owner Inspection:
 - 1. Make completed geotextile material available for inspection at manufacturer's factory prior to packaging for shipment.
 - 2. Notify Owner at least seven days before inspection is allowed.
- D. Owner Witnessing:
 - 1. Allow witnessing of factory inspections and tests at manufacturer's test facility.
 - 2. Notify Owner at least seven days before inspections and tests are scheduled.
- E. Certificate of Compliance:
 - 1. If manufacturer is approved by authorities having jurisdiction, submit certificate of compliance indicating Work performed at manufacturer's facility conforms to Contract Documents.
 - 2. Specified shop tests are not required for Work performed by approved manufacturer.

2.4 SUSTAINABILITY CHARACTERISTICS – (NOT USED)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.
- B. Verify that underlying surface is smooth and free of ruts or protrusions that could damage geotextile material.

3.2 PREPARATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation preparation.
- B. Subgrade Material and Compaction Requirements: As specified in Section 312333 – Trenching and Backfilling.

3.3 INSTALLATION

- A. Geotextile Material:
 - 1. Lay and maintain smooth and free of tensile stresses, folds, wrinkles, or creases.
 - 2. Ensure that material is in direct contact with subgrade.
 - 3. Orientate with long dimension of each sheet as indicated on drawings to direction of slope.
 - 4. Minimum Unseamed Joints Overlap: 18 inches.
- B. Securement Pins:
 - 1. Insert through geotextile midway between edges of overlaps and minimum 6 inches from free edges.
 - 2. Minimum Spacing:
 - a. Slopes Steeper than 3 Horizontal on 1 Vertical: 24 inches o.c.
 - b. Slopes 3 Horizontal on 1 Vertical to 4 Horizontal on 1 Vertical: 3 feet o.c.
 - c. Slopes Flatter than 4 Horizontal on 1 Vertical: 5 feet o.c.
 - 3. Ensure that washer bears against geotextile.
- C. Seams:
 - 1. Minimum Seamed Joints Overlap: 12 inches at longitudinal and transverse joints.
 - 2. Seams across Slope: Lap upper panel over lower panel.
 - 3. Sewn Seams:
 - a. Continuously sew seams at locations indicated on Drawings.
 - b. Stitch Type: As recommended by geotextile manufacturer.
 - c. Tie off thread at the end of each seam to prevent unraveling.

- 4. Thermal Seams:
 - a. As recommended by geotextile manufacturer.
 - b. Comply with ASTM D4886.
- D. Penetrations: As recommended by geotextile manufacturer.
- E. Repairing Damaged Geotextiles:
 - 1. Repair torn or damaged geotextile by placing patch of same type of geotextile over damaged area minimum of 12 inches beyond edge of damaged area and fasten as recommended by geotextile manufacturer.
 - 2. Remove and replace geotextile rolls which cannot be repaired.
- F. Fill and Cover:
 - 1. Place fill to prevent tensile stress or wrinkles in geotextile.
 - 2. Place fill from bottom of side-slopes upward.
 - 3. Do not drop fill from height greater than 3 feet.

3.4 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Requirements for inspecting and testing.
- B. Section 017000 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.
- C. Equipment Acceptance:
 - 1. Adjust, repair, modify, or replace components failing to perform as specified and rerun tests.
 - 2. Make final adjustments to equipment under direction of manufacturer's representative.

3.5 PROTECTION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for protecting finished Work.
- B. Ballast: Adequate to prevent uplift of material by wind.
- C. UV Exposure: Do not leave material uncovered for more than 30 days after installation.
- D. Do not use staples or pins to hold geotextiles in place where located adjacent to other geosynthetic layers that could be damaged.
- E. Do not operate equipment directly on top of geotextile.

END OF SECTION 310519.13

SECTION 312319 - DEWATERING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Dewatering system.
2. Surface water control system.
3. Monitoring wells.
4. System operation and maintenance.
5. Water disposal.

B. Related Sections:

1. Section 312333 – Trenching and Backfill: Trenching for utilities below ground water table.
2. Section 312500 - Erosion and Sedimentation Controls: Surface water runoff control.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

1. Section 012000 – Price and Payment Procedures

1.3 REFERENCES

A. ASTM International:

1. ASTM C33 - Standard Specification for Concrete Aggregates.

1.4 DEFINITIONS

A. Dewatering includes the following:

1. Lowering of ground water table and intercepting horizontal water seepage to prevent ground water from entering excavations, trenches, tunnels and shafts.
2. Reducing piezometric pressure within strata to prevent failure or heaving of excavations, trenches, tunnels and shafts.
3. Disposing of removed water.

B. Surface Water Control: Removal of surface water within open excavations.

1.5 SYSTEM DESCRIPTION

- A. Provide dewatering and surface water control systems to permit Work to be completed on dry and stable subgrade.**

1. The Contractor shall install and operate a well point system to prevent the upward flow of water into the excavation during construction where the presence of fine grained subsurface materials and high groundwater may cause a quick or unstable condition.
2. Provide monitoring wells and monitoring equipment to obtain meaningful observations of conditions affecting excavation, adjacent structures and adjacent water wells.

1.6 PERFORMANCE REQUIREMENTS

A. Design dewatering systems to:

1. Lower water table within areas of excavation to minimum 3 feet below bottom of excavation to permit Work to be completed on dry and stable subgrade.
2. Relieve hydrostatic pressures in confined water bearing strata below excavation to eliminate risk of uplift or other instability of excavation.
3. Prevent damage to adjacent properties, buildings, structures, utilities, and facilities from construction operations.
4. Prevent loss of fines, quick condition, or softening of foundation subgrade.
5. Maintain stability of sides and bottoms of excavations and trenches, face, walls, bottoms of tunnels and sides and bottoms of shafts.

B. Design surface water control systems to:

1. Collect and remove surface water and seepage entering excavation.

1.7 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Shop Drawings:

1. Indicate dewatering system layout, well depths, well screen lengths, dewatering pump locations, pipe sizes and capacities, grades, filter sand gradations, surface water control devices, valves, and water disposal method and location.
2. Indicate primary and standby power system location and capacity.
3. Indicate layout and depth of monitoring wells, piezometers and flow measuring devices for system performance measurement.
4. Include detailed description of dewatering and monitoring system installation procedures and maintenance of equipment.
5. Include description of emergency procedures to follow when problems arise.

C. Product Data: Submit data for each of the following:

1. Dewatering Pumps: Indicate sizes, capacities, priming method and motor characteristics.
2. Pumping equipment for control of surface water within excavation.

D. Design Data:

1. Indicate design values, analyses, and calculations to support design.

2. Include description and profile of geology, soil, and groundwater conditions.
- E. Field Reports: Test and monitoring reports as specified in Field Quality Control article.

1.8 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.
- B. Project Record Documents: Record actual locations and depths of capped wells and piping abandoned in place.

1.9 QUALITY ASSURANCE

- A. Comply with authorities having jurisdiction for the following:
 1. Drilling and abandoning of wells used for dewatering systems.
 2. Water discharge and disposal from pumping operations.
- B. Obtain permit from EPA under National Pollutant Discharge Elimination System (NPDES), for storm water discharge from construction sites.
- C. Perform Work in accordance with municipal and current industry standards.
- D. Maintain one copy of each document on site.

1.10 QUALIFICATIONS

- A. Installer: Company specializing in performing work of this section with minimum three years documented experience and responsible for design, operation, and maintenance of dewatering system.
 1. Assume sole responsibility for dewatering and surface water control systems and for loss or damage resulting from partial or complete failure of protective measures and settlement or resultant damage caused by ground water control operations.
- B. Design, install, and monitor operation of dewatering under direct supervision of Professional Engineer experienced in design of this Work and licensed in State of Georgia.

1.11 PRE-INSTALLATION MEETINGS

- A. Section 013000 - Administrative Requirements: Pre-installation meeting.
- B. Convene minimum one week prior to commencing work of this section.

1.12 SEQUENCING

- A. Section 011000 - Summary: Requirements for sequencing.

- B. Sequence work to obtain required permits before start of dewatering operations.
- C. Sequence work to install and test monitoring systems minimum 7 days before testing and operating dewatering systems.
- D. Sequence work to install and test dewatering and surface water control systems minimum 7 days before starting excavation, trenching, tunneling, or shaft drilling.

1.13 COORDINATION

- A. Section 013000 - Administrative Requirements: Requirements for coordination.
- B. Coordinate work to permit the following construction operations to be completed on dry stable substrate.
 - 1. Trenching and backfilling for utilities specified in Section 312333.

PART 2 - PRODUCTS

2.1 DEWATERING EQUIPMENT

- A. Furnish well points, pumps, tile drains or other approved methods of the type normally used in dewatering operations.

2.2 MONITORING EQUIPMENT

- A. Piezometers wells are required to monitor the ground water level to insure proper dewatering prior to excavation below the static water table.

2.3 ACCESSORIES

- A. Valves and Fittings: Furnish valves and fittings to isolate each well from header pipe and to prevent loss of pump prime.
- B. Filter Sand: ASTM C33; natural river or bank sand; washed; free of silt, clay, loam, friable or soluble materials, and organic matter; graded to suit well screen.
- C. Grout: Mixture of portland cement and bentonite clay or sand suitable for sealing abandoned wells and piping.

PART 3 - EXECUTION

3.1 EXAMINATION – (NOT USED)

- A. Section 013000 - Administrative Requirements: Verification of existing conditions before starting work.

- B. Conduct additional borings and investigations to supplement subsurface investigations identified in Section 003100 as required to complete dewatering system design.
- C. Call Local Utility Line Information service not less than three working days before performing Work.
 - 1. Request underground utilities to be located and marked within and surrounding construction areas.
- D. Employ licensed land surveyor to provide following documentation:
 - 1. Survey existing adjacent buildings, structures, and improvements for position and elevation of principal elements before and after completion of dewatering operations.

3.2 PREPARATION

- A. Protect existing adjacent buildings, structures, and improvements from damage caused by dewatering operations.

3.3 MONITORING WELLS

- A. Install monitoring wells at locations indicated on Drawings as specified for dewatering wells. By the use of well points, pumps, tile drains or other approved methods, the Contractor shall prevent the accumulation of water in excavated areas. Should water accumulate, it shall be promptly removed.
- B. Test each monitoring well point to verify installation is performing properly.
- C. Piezometer wells are required to monitor the ground water level to insure proper dewatering prior to excavation below the static water table. The number of wells required will vary depending on the size and depth of structures.
- D. Protect monitoring well standpipes from damage by construction operations.
- E. Maintain accessibility to monitoring wells continuously during construction operations.
- F. Maintain monitoring wells until groundwater is allowed to return to normal level.

3.4 DEWATERING SYSTEM

- A. Install dewatering system in accordance with Drawings.
- B. Locate system components to allow continuous dewatering operations without interfering with installation of permanent Work and existing public rights-of-way, sidewalks, and adjacent buildings, structures, and improvements.
- C. Drill wells in sizes and to depth indicated. Provide temporary surface casing when required to stabilize soil while advancing well.

- D. Install Work in accordance with municipal and current industry standards.

3.5 SURFACE WATER CONTROL SYSTEM

- A. Provide ditches, berms, and other devices to divert and drain surface water from excavation area as specified in Section 312500.
- B. Divert surface water and seepage water within excavation areas into sumps and pump water into drainage channels, storm drains or settling basins in accordance with requirements of agencies having jurisdiction.
- C. Control and remove unanticipated water seepage into excavation.
- D. After they have served their purpose, remove all temporary protective work at a satisfactory time and in a satisfactory manner. All diversion channels and other temporary excavations in areas where the compacted fill or other structures will be constructed shall be cleaned out, backfilled and processed under the same Specifications as those governing the compacted fill

3.6 SYSTEM OPERATION AND MAINTENANCE

- A. Operate dewatering system continuously until backfilling is complete.
- B. Provide 24-hour supervision of dewatering system by personnel skilled in operation, maintenance, and replacement of system components.
- C. Conduct daily observation of dewatering system and monitoring system. Make required repairs and perform scheduled maintenance.
- D. Fill fuel tanks before tanks reach 25 percent capacity.
- E. Start emergency generators at least twice each week to check operating condition.
- F. When dewatering system cannot control water within excavation, notify Engineer and stop excavation work.
 - 1. Supplement or modify dewatering system and provide other remedial measures to control water within excavation.
 - 2. Demonstrate dewatering system operation complies with performance requirements before resuming excavation operations.
- G. Modify dewatering and surface water control systems when operation causes or threatens to cause damage to new construction, existing site improvements, adjacent property, or adjacent water wells.
- H. Correct unanticipated pressure conditions affecting dewatering system performance.
- I. Do not discontinue dewatering operations without Engineer's approval.

3.7 WATER DISPOSAL

- A. Water pumped or drained from excavations, sewers, drains or water courses encountered in the work, shall be disposed of in a suitable manner without damage to the work under construction, adjacent property, pavements, roads, drives or water courses. No water shall be discharged to sanitary sewers. Sanitary sewage shall be pumped to sanitary sewers or disposed of by an approved method.

3.8 SYSTEM REMOVAL

- A. Remove dewatering and surface water control systems after dewatering operations are discontinued.
- B. Repair damage caused by dewatering and surface water control systems or resulting from failure of systems to protect property.

3.9 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements and 017000 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.
- B. After dewatering system is installed, perform pumping test to determine when selected pumping rate lowers water level in well below pump intake. Adjust pump speed, discharge volume, or both to ensure proper operation of each pump.
- C. Monitor and record the following, daily, until steady state conditions occur. Then monitor and record conditions twice each week.
 - 1. Average discharge flow rate for each deep well, eductor header, and well point.
- D. Monitor and record the following, daily, until dewatering system is discontinued. Then monitor and record conditions weekly until Work is completed, monitoring wells are removed, or until directed by Engineer.
 - 1. Ground water elevation.
- E. Monitor ground water discharge for sand content. Sample and test water from each well weekly for sand content. Maximum permitted sand content 5 parts per million.
- F. Monitor ground water discharge for contamination while performing pumping in vicinity of potentially contaminated sites. Sample and test water weekly for contaminants.
- G. Survey existing adjacent buildings, structures, and improvements weekly to detect movement in comparison to original elevations during dewatering operations.
 - 1. Notify Engineer immediately of measured movement.
- H. Submit initial installation reports including the following:
 - 1. Installation and development reports for well points and pumps.

2. Installation and baseline reports for monitoring wells and piezometers.
3. Test reports of monitoring well water analysis.
4. Initial dewatering flow rates.

I. Submit weekly monitoring reports including the following:

1. Dewatering flow rates.
2. Piezometer readings.
3. Test reports of discharge water analysis.
4. Maintenance records for dewatering and surface water control systems.

END OF SECTION 312319

SECTION 312333 – TRENCHING AND BACKFILLING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Clearing and grubbing
- B. Excavation and disposal of all wet and dry materials (including rock) encountered that must be removed for construction purposes
- C. Dewatering of trenches and other excavations
- D. Pipe bedding
- E. Backfilling and tamping of trenches, foundations, and other structures

1.2 RELATED SECTIONS

- A. Section 312319 - Dewatering
- B. Section 312500 – Erosion and Sedimentation Controls

1.3 DEFINITIONS

- A. Degree of Compaction: Degree of compaction is expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D698, for general soil types, abbreviated as percent laboratory maximum density.
- B. Hard Materials: Weathered rock, dense consolidated deposits, or conglomerate materials which are not included in the definition of "rock" but which usually require the use of heavy excavation equipment, ripper teeth, or jack hammers for removal.
- C. Rock: Solid homogeneous interlocking crystalline material with firmly cemented, laminated, or foliated masses or conglomerate deposits, neither of which can be removed without systematic drilling and blasting, drilling and the use of expansion jacks or feather wedges, or the use of backhoe-mounted pneumatic hole punchers or rock breakers; also large boulders, buried masonry, or concrete other than pavement.

1.4 SUBMITTALS

- A. The following shall be submitted in accordance with Section 013300 - Submittal Procedures:
- B. Test Reports - Submit copies of all laboratory and field test reports within 24 hours of the completion of the test.
 - 1. Borrow Site Testing: Fill and backfill test

2. Select material test
3. Porous fill test for capillary water barrier
4. Density tests

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Perform in a manner to prevent contamination or segregation of materials.

1.6 REQUIREMENTS FOR OFF SITE SOIL

- A. Soils brought in from off site for use as backfill shall be tested for petroleum hydrocarbons, BTEX, PCBs and HW characteristics (including toxicity, ignitability, corrosivity, and reactivity). Backfill shall not contain concentrations of these analytes above the appropriate State and/or EPA criteria, and shall pass the tests for HW characteristics. Determine petroleum hydrocarbon concentrations by using appropriate State protocols. Determine BTEX concentrations by using EPA SW- 846.3-3 Method 5035/82608. Perform complete TCLP in accordance with EPA SW- 846.3-3 Method 1311. Perform HW characteristic tests for ignitability, corrosivity, and reactivity in accordance with accepted standard methods. Perform PCB testing in accordance with accepted standard methods for sampling and analysis of bulk solid samples. Provide borrow site testing for petroleum hydrocarbons and BTEX from a grab sample of material from the area most likely to be contaminated at the borrow site (as indicated by visual or olfactory evidence), with at least one test from each borrow site. For each borrow site, provide borrow site testing for HW characteristics from a composite sample of material, collected in accordance with standard soil sampling techniques. Do not bring material onsite until tests results have been received and approved by the Owner.

1.7 FIELD MEASUREMENTS

- A. Verify that survey bench mark and intended elevations for the Work are as shown on the drawings.

1.8 COORDINATION

- A. Verify work associated with lower elevation utilities is complete before placing higher elevation utilities.

1.9 QUALITY ASSURANCE

- A. Utilities: Movement of construction machinery and equipment over pipes and utilities during construction shall be at the Contractor's risk. Excavation made with power- driven equipment is not permitted within two feet of known utility or subsurface construction. For work immediately adjacent to or for excavations exposing a utility or other buried obstruction, excavate by hand. Start hand excavation on each side of the indicated obstruction and continue until the obstruction is uncovered or until clearance for the new grade is assured. Support uncovered lines or other

existing work affected by the contract excavation until approval for backfill is granted by the Engineer. Report damage to utility lines or subsurface construction immediately to the Engineer.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. Satisfactory Materials: Any materials classified by ASTM 02487 as GW, GP, GM, GP-GM, GW-GM, GC, GP-GC, GM-GC, SW, or SP, free of debris, roots, wood, scrap material, vegetation, refuse, soft unsound particles, and frozen, deleterious, or objectionable materials. Unless specified otherwise, the maximum particle diameter shall be one-half the lift thickness at the intended location.
- B. Unsatisfactory Materials: Materials which do not comply with the requirements for satisfactory materials. Unsatisfactory materials also include man-made fills, trash, refuse, or backfills from previous construction. Unsatisfactory material also includes material classified as satisfactory which contains root and other organic matter, frozen material, and stones larger than 3 inches. The Engineer shall be notified of any contaminated materials.
- C. Backfill and Fill Material: ASTM 02487, classification GW, GP, GM, SW, SP, or SM, non-plastic, and a maximum of 25 percent by weight passing ASTM 01140, No. 200 sieve.

2.2 BORROW

- A. Obtain borrow materials required in excess of those furnished from excavations from sources outside of Owner's property.

PART 3 - EXECUTION

3.1 PROTECTION

- A. Shoring and Sheeting
 - 1. Take special care to avoid damage wherever excavation is being done. Sufficiently sheet, shore, and brace the sides of all excavations to prevent slides, cave-ins, settlement, or movement of the banks and to maintain the specified trench widths. Use solid sheets in wet, saturated, or flowing ground. All sheeting, shoring, and bracing shall have enough strength and rigidity to withstand the pressures exerted, to keep the walls of the excavation properly in place, and to protect all persons and property from injury or damage. Separate payment will not be made for sheeting, shoring, and bracing, which are considered an incidental part of the excavation work.
 - 2. Wherever employees may be exposed to moving ground or cave-ins, shore and lay back exposed earth excavation surfaces more than 5 feet high to a stable slope, or else provide some equivalent means of protection. Effectively protect trenches less than 5 feet deep when examination of the ground indicates hazardous ground movement may be expected.

Guard the walls and faces of all excavations in which employees are exposed to danger from moving ground by a shoring system, sloping of the ground, or some equivalent protection.

3. Trench excavation safety protection shall be accomplished as required by the most recent provisions of Part 1926, Subpart P - Excavations, Trenching, and Shoring of the Occupational Safety and Health Administration (OSHA) Standards and Interpretations, as may be amended. Comply with all OSHA standards in determining where and in what manner sheeting, shoring, and bracing are to be done. The sheeting, shoring, and bracing system shall be designed by a professional engineer licensed in the State of Georgia and shall be subject to approval by the Engineer. However, such approval does not relieve the Contractor of the sole responsibility for the safety of all employees, the effectiveness of the system, and any damages or injuries resulting from the lack or inadequacy of sheeting, shoring, and bracing.
4. Where excavations are made adjacent to existing buildings or structures or in paved streets or alleys, take particular care to sheet, shore, and brace the sides of the excavation so as to prevent any undermining of or settlement beneath such structures or pavement. Underpin adjacent structures wherever necessary, with the approval of the Engineer.
5. Do not leave sheeting, shoring, or bracing materials in place unless this is called for by the Drawings, ordered by the Engineer, or deemed necessary or advisable for the safety or protection of the new or existing work or features. Remove these materials in such a manner that the new structure or any existing structures or property, whether public or private, will not be endangered or damaged and that cave-ins and slides are avoided.
6. Fill and compact all holes and voids left in the work by the removal of sheeting, shoring, or bracing as specified herein.
7. The Contractor may use a trench box, which is a prefabricated movable trench shield composed of steel plates welded to a heavy steel frame. The trench box shall be designed to provide protection equal to or greater than that of an appropriate shoring system.
8. A "Qualified Person", as defined by OSHA regulations, shall be on-site at all times during activities requiring trench safety provisions.

B. Drainage and Dewatering

1. Provide for the collection and disposal of surface and subsurface water encountered during construction.
2. Drainage: So that construction operations progress successfully, completely drain construction site during periods of construction to keep soil materials sufficiently dry.: Where applicable, the Contractor shall establish/construct storm drainage features (ponds/basins) at the earliest stages of site development, and throughout construction grade the construction area to provide positive surface water runoff away from the construction activity and/or provide temporary ditches, swales, and other drainage features and equipment as required to maintain dry soils. When unsuitable working platforms for equipment operation and unsuitable soil support for subsequent construction features develop, remove unsuitable material and provide new soil material as specified herein. It is the responsibility of the Contractor to assess the soil and ground water conditions

presented by the plans and specifications and to employ necessary measures to permit construction to proceed. Excavated slopes and backfill surfaces shall be protected to prevent erosion and sloughing. Excavation shall be performed so that the site, the area immediately surrounding the site, and the area affecting operations at the site shall be continually and effectively drained.

3. Dewatering:

- a. Dewatering Trenches: Where quicksand is encountered, dewatering shall be done by well pointing. If soil conditions are not suitable for well points, trench drains or crushed stone or gravel shall be constructed to carry the water to sumps and the water removed by pumps or bailing.
- b. Groundwater flowing toward or into excavations shall be controlled to prevent sloughing of excavation slopes and walls, boils, uplift and heave in the excavation and to eliminate interference with orderly progress of construction. French drains, sumps, ditches or trenches will not be permitted within 3 feet of the foundation of any structure, except with specific written approval, and after specific contractual provisions for restoration of the foundation area have been made. Control measures shall be taken by the time the excavation reaches the water level in order to maintain the integrity of the in situ material. While the excavation is open, the water level shall be maintained continuously, at least 2 feet below the working level.
- c. Operate dewatering system continuously until construction work below existing water levels is complete. Submit performance records weekly.

C. Underground Utilities

1. Location of the existing utilities indicated is approximate. The Contractor shall physically verify the location and elevation of all existing utilities prior to starting construction. The Contractor shall contact the State One-Call Service affected utilities for assistance in locating existing utilities.
- D. Machinery and Equipment: Movement of construction machinery and equipment over pipes during construction shall be at the Contractor's risk. Repair, or remove and provide new pipe for existing or newly installed pipe that has been displaced or damaged.

3.2 SURFACE PREPARATION

- A. Clear and grub project area as required.
- B. Identify required lines, levels, contours, and datum.
- C. Protect plant life, lawns, and other features remaining as part of final landscaping.
- D. Maintain and protect above and below grade utilities which are to remain.

3.3 EXCAVATION

- A. Excavate to contours, elevation, and dimensions indicated. Reuse excavated materials that meet the specified requirements for the material type required at the intended location. Keep excavations free from water. Excavate soil disturbed or weakened by Contractor's operations, soils softened or made unsuitable for subsequent construction due to exposure to weather. Excavations below indicated depths will not be permitted except to remove unsatisfactory material.
- B. Wherever muck, quicksand, soft clay, swampy ground, or other material unsuitable for foundations, subgrade, or backfilling is encountered, remove it and continue excavation until suitable material is encountered. The material removed shall be disposed of in the manner described below. Then refill the areas excavated for this reason with 1 inch to 2 inch sized crushed stone up to the level of the lines, grades, and/or cross sections shown on the Drawings. The top 6 inches of this refill shall meet the requirements for bedding material.
- C. Unless specified otherwise, refill excavations cut below indicated depth with backfill and fill material and compact to 95 percent of ASTM D698 maximum density. Satisfactory material removed below the depths indicated, without specific direction of the Engineer, shall be replaced with satisfactory materials to the indicated excavation grade. Determination of elevations and measurements of approved overdepth excavation of unsatisfactory material below grades indicated shall be done under the direction of the Engineer.
- D. Pipe Trenches:
 - 1. Unless the construction of lines by tunneling, jacking, or boring is called for by the Drawings or specifically authorized by the Engineer, make excavation for pipelines in open cut and true to the lines and grades shown on the Drawings or established by the Engineer on the ground. Cut the banks of trenches between vertical parallel planes equidistant from the pipe centerline. The trench shall be dug to the alignment and grade required. The trench shall be braced if necessary and drained in order that workmen therein may work safely and efficiently. It is essential that the discharge from any pumps be led to natural drainage channels or to drains. Minimum width of trench shall be six inches (6") from the outside of barrel of pipe on each side of pipe. Maximum width of trench shall be nine inches (9") from the outside of barrel of pipe on each side of pipe. Sides of trench shall be dug and maintained substantially vertical except Contractor shall adhere to all applicable requirements of OSHA for trench safety.
 - 2. Grade bottom of trenches to provide uniform support for each section of pipe after pipe bedding placement. Tamp if necessary to provide a firm pipe bed. Recesses shall be excavated to accommodate bells and joints so that pipe will be uniformly supported for the entire length. Rock, where encountered, shall be excavated to a depth of at least 6 inches below the bottom of the pipe. Any part of the trench excavated below grade shall be corrected with approved material thoroughly compacted. Wherever the material at the bottom of the trench is unsuitable for the proper installation of the pipe, the City will direct the removal and replacement of the unsuitable material. When so directed, undercut the trench and backfill with No. 57 stone meeting the requirements of Georgia Department of Transportation Specification 800.01. Place and compact this material to bring the trench to the required grade.

3. Excavate bell holes for bell and spigot pipe at proper intervals so that the barrel of the pipe will rest for its entire length upon the bottom of the trench. Bell holes shall be large enough to permit proper jointing of the pipe. Do not excavate bell holes more than 2 joints ahead of pipe laying.
4. For all pipe other than ductile iron pipe, provide minimum of four inches of "Bedding Material", unless otherwise shown or specified.
5. Do not excavate pipe trenches more than 200 feet ahead of the pipe laying, and perform all work so as to cause the least possible inconvenience to the public. Construct temporary bridges or crossings when and where the Engineer deems necessary to maintain vehicular or pedestrian traffic.
6. In all cases where materials are deposited along open trenches, place them so that in the event of rain no damage will result to the work and/or to adjacent property.

E. Hard Material and Rock

1. Definition of Rock: Any material which cannot be excavated with a backhoe having a bucket curling force rated at not less than 31,600 pounds (Caterpillar Model 320 or equal).
2. Excavation: Where rock is encountered in trenches, excavate to the minimum depth which will provide clearance below the pipe barrel of four inches (4") plus required bedding depth for pipe and manholes. Remove boulders and stones to provide a minimum of six inches (6") clearance between the rock and any part of the pipe or manhole.
3. Blasting: Provide experienced workmen to perform blasting. Conduct blasting operations in accordance with all existing ordinances and regulations. Protect all structures from the effects of the blast. Repair any resulting damage. If the Contractor persistently uses excessive blasting charges or blasts in an unsafe or improper manner, the City may direct the Contractor to employ an independent blasting consultant to supervise the preparation for each blast and approve the quantity of each charge.
4. Removal of Rock: Do not use excavated rock as backfill material. Dispose of rock which is surplus or not suitable for use as rip-rap.

F. Excavated Materials

1. Satisfactory excavated material required for fill or backfill shall be placed in the proper section of the permanent work required or shall be separately stockpiled if it cannot be readily placed. Satisfactory material in excess of that required for the permanent work and all unsatisfactory material shall be disposed of as specified in Paragraph "DISPOSITION OF SURPLUS MATERIAL."

3.4 FILLING AND BACKFILLING

- A. Fill and backfill to contours, elevations, and dimensions indicated. Compact each lift before placing overlaying lift.
- B. Backfill and Fill Material Placement for Utilities

1. Erosion Control: Plan excavation work to prevent erosion and the washing of soil into adjacent streams. Limit the amount of open excavation at any one time. Place spoil in the proper place and keep natural water routes open. All erosion control procedures must comply with the Georgia Erosion and Sedimentation Control Act.
2. Time of Backfilling: As soon as practicable after the completion of laying and jointing of the pipe, the trench shall be backfilled and at no time shall the completed backfilled trench be more than 200 feet behind the pipe laying.
3. Backfill Procedure at Pipe Zone: Haunching material shall be deposited in the trench simultaneously on both sides of the pipe for the full width of the trench to an elevation as shown on the detail for type pipe selected. Initial backfill material shall be moistened if necessary, tamped in thin six inch (6") layers and thoroughly compacted on each side of the pipe as shown on the Typical Sewer Pipe Bedding Detail. Walking or working on the completed pipe line, except as may be necessary in tamping or backfilling, will not be permitted until the trench has been compacted or a height of at least two-and-one-half feet (2 ½') over the barrel of the pipe for PVC pipe and two feet (2') over the barrel of the pipe for ductile iron (DI) pipe.
4. Compaction Requirements: All backfill for trenches under paved or roadway areas shall be compacted to 98 percent of the Standard Proctor maximum density (ASTM D-698). Backfill for trenches other than under pavement areas shall be compacted to 95 percent of the Standard Proctor maximum density (ASTM D-698) to eighteen inches (18") above the crown of the pipe. The remainder shall be compacted to 93 percent of the Standard Proctor maximum density (ASTM D-698). The Contractor shall furnish the City proof of compaction at a point eighteen inches (18") above the crown of the sewer pipe at all pavement, driveway or roadway crossings. Additional compaction tests are required at each crossing eight inches (8") below the surface of the pavement or on the pavement subgrade before pavement placement. Contractor shall incur all costs for compaction tests performed by a testing laboratory approved by the City and selected by the Contractor.
5. Rock and Rock Fragment Exclusion: No rock or rock fragments shall be used in the backfill for at least eighteen inches (18") above the top of the pipe and no stone larger than eight inches (8") in its greatest dimension shall be used in the backfill.
6. Deficiency of Backfill: Any deficiency in the quantity of material for backfilling the trenches or for filling depressions caused by settlement shall be supplied by the Contractor.

3.5 BORROW

- A. Whenever the backfill of excavated areas or the placement of embankments requires more material than is available from authorized excavations, or whenever the backfill material from such excavations is unsuitable, then obtain additional material from other sources. This may require the opening of borrow pits at points accessible to the work. In such cases, make suitable arrangements with the property owner and pay all incidental costs, including any royalties, for the use of the borrowed material. Before a borrow pit is opened, the quality and suitability of its material shall be approved by the Engineer.

- B. Excavate borrow pits in such a way that the remaining surfaces and slopes are reasonably smooth and that adequate drainage is provided over the entire area. Construct drainage ditches wherever necessary to provide outlets for water to the nearest natural channel, thus preventing the formation of pools in the pit area. Leave the sides of borrow pit cuts at a maximum slope of 2:1 unless otherwise directed by the Engineer.
- C. Properly clear and grub borrow pits and remove all objectionable matter from the borrow pit material before placing it in the backfill.
- D. The taking of materials from borrow pits for use in the construction of backfill, fills, or embankments shall be considered an incidental part of the work; no separate payment shall be made for this.

3.6 FINISH OPERATIONS

- A. Grading: Finish grades as indicated within one-tenth of one foot. Grade areas to drain water away from structures. Maintain areas free of trash and debris. For existing grades that will remain but which were disturbed by Contractor's operations, grade as directed.
- B. Protection of Surfaces: Protect newly backfilled, graded, and topsoiled areas from traffic, erosion, and settlements that may occur. Repair or reestablish damaged grades, elevations, or slopes.
- C. Restoration of Surfaces: The Contractor shall replace all curbing, sidewalks, pavements, gutters, shrubbery, fences, sod and other surfaces disturbed to a condition equal to that before the work began, furnishing all labor and materials incidental thereto.

3.7 DISPOSITION OF SURPLUS MATERIAL

- A. Whenever practicable, all materials removed by excavation that are suitable for backfilling pipe trenches or for other purposes shown on the Drawings or directed by the Engineer shall be used for these purposes. Any materials not so used shall be considered waste materials and disposed of by the Contractor as specified below.
- B. Once any part of the work is completed, properly dispose of all surplus or unused materials (including waste materials) left within the construction limits of that work. The Contractor shall dispose of these surplus and waste materials off-site in an appropriate manner in conformity with pertinent codes and ordinances. Leave the surface of the work in a neat and workmanlike condition, as described below.
- C. The disposal of waste materials shall be considered an integral part of the excavation work and one for which no separate payment shall be allowed.

3.8 FIELD QUALITY CONTROL

- A. Sampling: Take the number and size of samples required to perform the following tests.
- B. Testing: Perform one of each of the following tests for each material used. Provide additional tests for each source change.

1. Bedding Material and Fill and Backfill Material Testing: Test fill and backfill material in accordance with ASTM C136 for conformance to ASTM D2487 gradation limits; ASTM D1140 for material finer than the No. 200 sieve; ASTM D4318 for liquid limit and for plastic limit; ASTM D698 or ASTM D1557 for moisture density relations, as applicable.
2. Density Tests: Test density in accordance with ASTM D1556, or ASTM D6938. When ASTM D6938 density tests are used, verify density test results by performing an ASTM D1556 density test at a location already ASTM D6938 tested as specified herein. Perform an ASTM D1556 density test at the start of the job, and for every 10 ASTM D6938 density tests thereafter. Test each lift at randomly selected locations with one test per 400 linear feet in each lift.

END OF SECTION 312323

SECTION 312500 - EROSION AND SEDIMENTATION CONTROL

PART 1 - GENERAL

1.1 SCOPE

- A. The work specified in this Section consists of providing and maintaining temporary and permanent erosion and sedimentation controls as shown on the Drawings. This Section also specifies the subsequent removal of temporary erosion and sedimentation controls.
- B. Temporary and permanent erosion and sedimentation controls include grassing and mulching of disturbed areas and structural barriers at those locations which will ensure that erosion during construction will be maintained within acceptable limits. Acceptable limits are as established by the Georgia Erosion and Sedimentation Control Act of 1975, as amended, Section 402 of the Federal Clean Water Act, and applicable codes, ordinances, rules, regulations and laws of local and municipal authorities having jurisdiction. For installation and maintenance guidance, refer to the Manual for Erosion and Sediment Control in Georgia, latest edition.
- C. Land disturbance activity shall not commence until the Land Disturbance Permit has been issued.
- D. Land disturbance permit shall be obtained and paid for by the Contractor.
- E. Discrepancies with these Specifications and the Drawings shall default to the stricter requirements in accordance with Georgia Soil and Water Conservation Commission standards.

1.2 SUBMITTALS

- A. Submit product data in accordance with the requirements of Section 013300 of these Specifications.
- B. Prior to any construction activity, the Contractor shall submit, for the Engineer's approval, a schedule for the accomplishment of temporary and permanent erosion and sedimentation control work. No work shall be started until the erosion and sedimentation control schedule and methods of operation have been approved by the Engineer.

1.3 QUALITY ASSURANCE

- A. The temporary and permanent erosion and sedimentation control measures shown on the Drawings are minimum requirements. Any additional erosion and sedimentation control measures required by the Contractor's means, methods, techniques and sequence of operation will be installed by the Contractor at no additional cost to the Owner.
- B. Perform all work under this Section in accordance with all pertinent rules and regulations including, but not necessarily limited to, those stated in these

- C. Specifications. Where provisions of pertinent rules and regulations conflict with these Specifications, the more stringent provisions shall govern.
- D. Provide all materials and promptly take all actions necessary to achieve effective erosion and sedimentation control in accordance with the Georgia Erosion and Sedimentation Control Act of 1975, as amended (OCGA §12-7-1, et. seq.), local ordinances, other permits, local enforcing agency guidelines and these Specifications.
- E. Basic Principles
 - 1. Coordinate the land disturbance activities to fit the topography, soil types and conditions.
 - 2. Minimize the disturbed area and the duration of exposure to erosive elements.
 - 3. Provide temporary or permanent stabilization to disturbed areas immediately after rough grading is complete.
 - 4. Safely convey run-off from the site to a stable outlet to prevent flooding and damage to downstream facilities resulting from increased runoff from the site.
 - 5. Retain sediment on-site that was generated on-site.
 - 6. Minimize encroachment upon watercourses.
- F. Implementation
 - 1. The Contractor is solely responsible for the control of erosion within the Project site and the prevention of sedimentation from leaving the Project site or entering waterways.
 - 2. The Contractor shall install temporary and permanent erosion and sedimentation controls which will ensure that runoff from the disturbed area of the Project site shall pass through a filter system before exiting the Project site.
 - 3. The Contractor shall provide temporary and permanent erosion and sedimentation control measures to prevent silt and sediment from entering the waterways.
 - 4. The Contractor shall limit land disturbance activity to those areas shown on the Drawings.
 - 5. The Contractor shall maintain erosion and sedimentation control measures within disturbed areas on the entire site at no additional cost to the Owner until the acceptance of the Project. Maintenance shall include mulching, re-seeding, clean-out of sediment barriers and sediment ponds, replacement of washed-out or undermined rip rap and erosion control materials, to the satisfaction of the Engineer.
 - 6. All fines imposed for improper erosion and sedimentation control shall be paid by the Contractor

7. The Contractor shall use all means necessary to control dust on and near the work and all off-site borrow areas, in accordance to the Manual for Erosion and Sedimentation Control in Georgia, latest edition. The Contractor should thoroughly moisten all surfaces as required to prevent dust from being a nuisance to the public, neighbors and concurrent performance of work on the site.

PART 2 - PRODUCTS

2.1 SEDIMENT BARRIERS

A. Silt Fence

1. Sensitive areas Type S silt fence is a combination of Type NS silt fence fabric with woven wire reinforcement. Type S silt fence woven wire reinforcement shall meet the requirements of Section 171 of the Georgia Department of Transportation Standard Specifications, latest edition. Posts shall be 5 feet in length and shall be made of wood conforming to Georgia Soil and Water Conservation Commission standards for alternative best management practices.
2. Silt fence fabric shall be an approved product on the Georgia DOT Qualified Product List No. 36, latest edition.

B. Hay or Straw Bales

1. Hay or straw bales shall be clean, seed-free cereal hay or straw, rectangular in shape, wire or nylon bound, and contain five cubic feet or more of material.
2. Stakes shall be steel re-enforcement bars, steel pickets or 2" x 2" wooden stakes.

2.2 CHECK DAMS

A. Stone Check Dams

1. Stone check dams shall be constructed of graded size 2-10-inch stone.
2. The geotextile shall be in accordance with AASHTO M288 Section 7.3, Separation Requirements, Table 3.

B. Rock Check Dams

1. Stone sizing: The stone size shall be determined by the design criteria established in the Rip Rap section - Manual for Erosion and Sedimentation Control in Georgia, latest edition. The rock dam can be faced with smaller stone on the upstream side for additional filtering effect.

2. Geotextile: Geotextiles shall be used as a separator between the graded stone, the soil base, and the abutments. The geotextile shall be specified in accordance with AASHTO M288 Section 7.5, Permanent Erosion Control Recommendations.

2.3 CONSTRUCTION EXIT

- A. Stone: Use sound, tough, durable stone resistant to the action of air and water. Slabby or shaley pieces will not be acceptable. Aggregate size shall be in accordance with the National Stone Association Size R-2 (1.5 to 3.5-inch stone).
- B. Geotextile: The geotextile underliner must be placed the full length and width of the entrance. Geotextile selection shall be based on AASHTO M288-98 specification:
 1. For subgrades with a CBR greater than or equal to 3 or shear strength greater than 90 kPa, geotextile must meet requirements of section AASHTO M288 Section 7.3, Separation Requirements.
 2. For subgrades with a CBR between 1 and 3 or sheer strength between 30 and 90 kPa, geotextile must meet requirements of AASHTO M288 Section 7.4, Stabilization Requirements.

2.4 RIP RAP

- A. Stone Rip Rap: Use sound, tough, durable stones resistant to the action of air and water. Slabby or shaley pieces will not be acceptable. Sizes are shown in the Drawings for each design requiring rip rap construction. The following classifications shall be used in the construction of slope or channels as shown on the Drawings:
 1. Graded Rip Rap - durable, dense, specifically selected and graded, quarried stone, placed to prevent erosion. Sizes shall be in accordance to the Manual for Erosion and Sedimentation Control in Georgia, latest edition.
 2. Filter Bedding Stone - stone generally less than 6 inches in size, that may be placed under graded rip rap stone in a layer or combination of layers, designed and installed in such a manner as to prevent loss of underlying soil or finer materials because of moving water. Sizes shall be in accordance to the Manual for Erosion and Sedimentation Control in Georgia, latest edition.
 3. Surge Stone - a quarry run ungraded, unscreened material which may or may not have fines.

2.5 GABIONS

- A. Gabions shall be large, multi-celled, rectangular wire mesh boxes filled with 4 to 8-inch size pieces of stone to prevent erosion, scour or sloughing of an embankment. Gabions shall have the following features:
 1. Hexagonal mesh pattern, which under stress will deform but not break.

2. Triple twist, which will make the mesh non-raveling.
 3. Reinforcing wires woven into each corner, which will increase the strength at the stress points and help the gabion retain its shape during and after filling.
 4. A diaphragm securely attached to the base, which will prevent the shifting of the stone and at the same time, reinforce the gabion.
- B. The wire mesh shall have an opening of approximately 3 x 4-inches and shall be a minimum 12 gauge. Wire mesh shall be galvanized.
- C. Gabion baskets shall be 12 feet long x 3 feet high with four cells.
- D. Geotextile: Geotextiles shall be used behind all gabion structures. Geotextiles shall be in accordance with AASHTO M288 Section 7.5, Permanent Erosion Control Requirements.

2.6 EROSION CONTROL MATTING AND BLANKETS

- A. All blanket and matting materials shall be in accordance to the Manual for Erosion and Sedimentation Control in Georgia, latest edition.
- B. Temporary Erosion Control Blankets: Use in concentrated flow areas, all slopes steeper than 3:1 and with a height of ten feet or greater, and cuts and fills within stream buffers, shall be stabilized with the appropriate erosion control matting or blankets.
1. Straw blankets: Shall consist of weed-free straw from agricultural crops formed into a blanket. Blankets shall have a top side of photodegradable plastic mesh with a maximum mesh size of 5/16 x 5/16 inch sewn to the straw with biodegradable thread that is appropriate for slopes. The blanket shall have a minimum thickness of 3/8 inch and minimum dry weight of 0.5 pounds per square yard.
 2. Excelsior blankets: Shall consist of curled wood excelsior (80% of fibers are six inches or longer) formed into a blanket. The blanket shall have clear markings indicating the top side of the blanket and be smolder resistant. Blankets shall have photodegradable plastic mesh having a maximum mesh size of 1- 1/2Y:i x 3 inches. The blanket shall have a minimum thickness of 1/4 of an inch and a minimum dry weight of 0.8 pounds per square yard. Slopes require excelsior matting with the top side of the blanket covered in the plastic mesh, and for waterways, both sides of the blanket require plastic mesh.
 3. Coconut fiber blankets: Shall consist of 100% coconut fiber formed into a blanket. The minimum thickness of the blanket shall be 1/4 of an inch with a minimum dry weight of 0.5 pounds per square yard. Blankets shall have photodegradable plastic mesh, with a maximum mesh size of 5/8 x 5/8 inch and sewn to the fiber with a breakdown resistant synthetic yarn. Plastic mesh is required on both sides of the blanket if used in waterways. A maximum of two inches is allowable for the stitch pattern and row spacing.
 4. Wood fiber blankets: Shall consist of reprocessed wood fibers that does not possess or contain any growth or germination inhibiting factors. The blanket shall have a photodegradable plastic mesh, with a maximum mesh size of 5/8 x 3/4 inch, securely

bonded to the top of the mat. The blanket shall have a minimum dry weight of 0.35 pounds per square yard. A maximum of two inches is allowable for the stitch pattern and row spacing. This practice shall be applied only to slopes.

5. Jute Mesh: To be applied to slopes. Jute mesh with a 48 inch width shall show between 76 and 80 warpings and a one yard length shall show between 39 to 43 weftings. The woven mesh shall be at least 45 inches wide. Yarn shall have a unit weight of at least 0.9 pounds per square yard, but not more than 1.5 pounds per square yard.

C. Permanent Matting: Use in concentrated flow areas, all slopes steeper than 3:1 and with a height of ten feet or greater, and cuts and fills within stream buffers, shall be stabilized with the appropriate erosion control matting or blankets.

1. Permanent matting shall consist of a lofty web of mechanically or melt bonded polymer nettings, monofilaments or fibers which are entangled to form a strong and dimensionally stable matrix. Polymer welding, thermal or polymer fusion, or the placement of fibers between two high strength, bi-axially oriented nets bound securely together by parallel lock stitching with polyolefin, nylon or polyester threads are all appropriate bonding methods. Mats shall maintain their shape before, during, and after installation, under dry or water saturated conditions. Mats must be stabilized against ultraviolet degradation and shall be inert to chemicals normally encountered in a natural soil environment.

2. The mat shall conform to the following physical properties:

<u>Property</u>	<u>Minimum Value</u>
Thickness	0.5 inch
Weight	0.6 PSY
Roll Width	38 inches
Tensile Strength	
Length (50% elongation)	15 lbs./in.
Length (ultimate)	20 lbs./in.
Width (50% elongation)	5 lbs./in.
Width (ultimate)	10 lbs./in.
(ASTM D 1682-6" strip)	
Ultraviolet Stability	80%
(1,000 hours in an Atlas ARC Weatherometer, ASTM G 23, Type D in accordance with ASTM D 822)	

D. Stapling and Anchoring Materials:

1. Temporary Blankets: Staples shall be used to anchor temporary blankets. U- shaped wire (11 gauge or greater) staples with legs at least 6 inches in length and a crown of one inch or appropriate biodegradable staples can be used. Staples shall be of sufficient thickness for soil penetration without undue distortion.

2. Permanent Matting: Sound wood stakes, 1 x 3 inches stock sawn in a triangular shape, shall be used. Depending on the compaction of the soil, select stakes with a length from 12 to 18 inches. U-shaped staples shall be 11 gauge steel or greater, with legs at a minimum of 8 inches length with a 2 inch crown.

2.7 CHANNEL STABILIZATION

- A. Vegetated Lining: Vegetated lining shall be designed to resist erosion when the channel is flowing at the 25-year frequency discharge. Temporary erosion control blankets or sod shall be used on all channels and concentrated flow areas to aid in the establishment of the vegetated lining. If a vegetated lining is desired in a channel with velocities between 5- 10 ft./sec., permanent soil reinforcement matting shall be used.
- B. Rock Rip- Rap Lining: Rock rip rap shall be designed to resist displacement when the channel is flowing at the 25-year frequency discharge. Rock rip rap lining should be used when channel velocities are between 5 and 10 ft./sec.
- C. Concrete Lining
 1. Concrete shall be constructed in accordance with the plan and details in the Drawings.
 2. A separation geotextile should be placed under concrete linings to prevent undermining in the event of stress cracks due to settlement of the base material. Geotextiles shall be in accordance with AASHTO M288 Section 7.5, Permanent Erosion Control Requirements.

2.8 STORM DRAIN OUTLET PROTECTION

- A. Stone size: Stone size as indicated for each outlet in the Storm Drain Outlet Protection detail shown in the Drawings.
- B. Geotextile: Geotextiles shall be used as a separator between the graded stone, the soil base, and the abutments. The geotextile shall be specified in accordance with AASHTO M288-96 Section 7.5, Permanent Erosion Control Recommendations.
- C. Stone quality: Select stone for rip rap from field stone or quarry stone. The stone should be hard, angular, and highly weather-resistant. The specific gravity of the individual stones should be at least 2.5.

2.9 TEMPORARY MULCHING

- A. Dry straw or hay: Shall be applied at a depth of 2 to 4 inches providing complete soil coverage. Material shall be clean, seed-free cereal hay or straw.
- B. Wood waste (chips, sawdust or bark): Shall be applied at a depth of 2 to 3 inches. Organic material from the clearing stage of development should remain on site, be chipped, and applied as mulch.

- C. Mulch Binder: Mulch on slopes exceeding 3 (horizontal) to 1 (vertical) shall be held in place by the use of a mulch binder, as approved by the Engineer. The mulch binder shall be non toxic to plant and animal life and shall be approved by the Engineer.

2.10 TEMPORARY GRASSING

- A. Grassing materials shall meet the requirements of the Manual for Erosion and Sedimentation Control in Georgia, latest edition, section that includes "Disturbed Area Stabilization (With Temporary Vegetation)".
- B. Seed rate, fertilization, lime application and other requirements shall be provided as shown on the Drawings.
- C. Water: Water shall be free of excess and harmful chemicals, organisms and substances which may be harmful to plant growth or obnoxious to traffic. Salt or brackish water shall not be used. Water shall be furnished by the Contractor.

2.11 PERMANENT GRASSING

As specified elsewhere in these Specifications.

2.12 SEDIMENT TRAPS

- A. The area under the embankment should be cleared, grubbed, and stripped of any vegetation and root mat.
- B. Fill material for the embankment should be free of roots or other woody vegetation, organic material, large stones, and other objectionable material.

PART 3 - EXECUTION

3.1 GENERAL

- A. Temporary and permanent erosion and sedimentation control measures shall prevent erosion and prevent sediment from exiting the site. If, in the opinion of the Engineer, the Contractor's temporary erosion and sedimentation control measures are inadequate, the Contractor shall provide additional maintenance for existing measures or additional devices to control erosion and sedimentation on the site at no additional cost of the owner.
- B. All erosion and sedimentation control devices and structures shall be inspected by the Qualified Personnel as defined in Section 01 57 23 of the Specifications at least once a week and within 24 hours of the end of a storm that is 0.5 inches or greater. Any device or structure found to be damaged will be repaired or replaced by the end of the day.
- C. All erosion and sedimentation control measures and devices shall be constructed and maintained as indicated on the Drawings or specified herein until adequate permanent disturbed area stabilization has been provided and accepted by the Engineer. Once adequate permanent

stabilization has been provided and accepted by the Engineer, all temporary erosion and sedimentation control structures and devices shall be removed.

3.2 INSTALLATION AND MAINTENANCE OF EROSION AND SEDIMENT CONTROLS

A. Sediment Barriers

1. Sediment barriers shall include, but are not necessarily limited to silt fences and any device which prevents sediment from exiting the disturbed area.
2. Sediment barriers shall not be used in any flowing stream, creek or river.
3. Sediment barriers shall be installed as shown on the Drawings and as directed by the Engineer.
4. Along stream buffers and other sensitive areas, two rows of Type C silt fence or one row of Type C silt fence backed by hay bales shall be used.
5. Sediment barriers shall be maintained to ensure the depth of impounded sediment is no more than one-half of the original height of the barrier or as directed by the Engineer. Torn, damaged, destroyed or washed-out barriers shall be repaired, reinforced or replaced with new material and installed as shown on the Drawings and as directed by the Engineer.
6. Sediment Barrier Removal
 - a. Sediment barrier shall be removed once the disturbed area has been stabilized with a permanent vegetative cover and the sediment barrier is no longer required as directed by the Engineer.
 - b. Accumulated sediment shall be removed from the barrier and spread over the site.
 - c. All non-biodegradable parts of the barrier shall be disposed of properly.
 - d. The disturbed area created by barrier removal shall be permanently stabilized.

B. Check and Rock Dams

1. Check and rock dams shall not be used in any flowing stream, creek or river.
2. Check and rock dams shall be installed as shown on the Drawings and as directed by the Engineer.
3. Stone check dams: Mechanical or hand placement shall be required to insure complete coverage of entire width of ditch or swale and that center of dam is lower than edges.
4. Rock dams: Mechanical or hand placement will be required to insure that the rock dam extends completely across the channel and securely ties into both channel banks. The center of the dam must be no less than six inches lower than the lowest side, to serve as a type of weir. Gabions can be installed to serve as rock filter dams, but should follow

recommended sizing and installation specifications. Refer to Gabions in this specification.

5. Height: The center of the check dam must be at least 9 inches lower than outer edges. Dam height should be 2 feet maximum measured to center of check dam.
6. Side Slopes: Side slopes shall be 2:1 or flatter.
7. Spacing: Two or more check dams in series shall be used for drainage areas greater than one acre. Maximum spacing between dams should be such that the toe of the upstream dam is at the same elevation as the top of the downstream dam.
8. A geotextile should be used as a separator between the graded stone and the soil base and abutments. The geotextile shall be placed immediately adjacent to the subgrade without any voids and extend five feet beyond the downstream toe of the dam to prevent scour.
9. Check and rock dams shall be maintained to ensure the depth of impounded sediment is no more than one-half of the original height of the check dam or as directed by the Engineer. Damaged, destroyed or washed-out check dams shall be repaired, reinforced or replaced with new material and installed as shown on the Drawings and as directed by the Engineer.
10. Check and Rock Dams removal
 - a. Check and rock dams shall be removed [shall remain] once the disturbed area has been stabilized with a permanent vegetative cover and the sediment barrier is no longer required as directed by the Engineer.
 - b. Accumulated sediment shall be removed from the check and rock dams when it reaches a depth of one-half of the original height of the dam and removed from the site.
 - c. All non-biodegradable parts of the barrier shall be disposed of properly.
 - d. The disturbed area created by check or rock dam removal shall be permanently stabilized.

C. Construction Exit

1. Construction exit(s) shall be placed as shown on the Drawings and as directed by the Engineer. A construction exit shall be located at any point traffic will be leaving a disturbed area to a public right-of-way, street, alley, sidewalk or parking area.
2. Placement of Construction Exit Material: The ground surface upon which the construction exit material is to be placed shall be prepared to a smooth condition free from obstructions, depressions or debris. The geotextile underliner shall be placed to provide a minimum number of overlaps and a minimum width of one foot of overlap at each joint. The stone shall be placed with its top elevation conforming to the surrounding roadway elevations. The stone shall be dropped no more than three feet during construction.

3. Construction Exit Maintenance: The Contractor shall regularly maintain the exit with the top dressing of stone to prevent tracking or flow of soil onto public rights-of-way and paved surfaces as directed by the Engineer. This shall require periodic top dressing with 1.5-3.5 inch stone, as conditions demand.
4. Construction Exit Removal: Construction exit(s) shall be removed and properly disposed of when the disturbed area has been properly stabilized, the tracking or flow of soil onto public rights-of-way or paved surfaces has ceased and as directed by the Engineer.

D. Rip Rap

1. Rip rap shall be placed as shown on the Drawings and as directed by the Engineer. Rip rap shall be placed at all points where natural vegetation is disturbed on the banks of streams or drainage ditches. Compact backfill and place rip rap to prevent subsequent settlement and erosion. This requirement applies equally to construction along side a stream or drainage ditch as well as crossing a stream or drainage ditch.
2. When trenching across a stream or drainage ditch, place rip rap over the entire disturbed area upstream and downstream of the trench excavation. Place rip rap across creek bottom, across creek banks and extend rip rap placement five feet beyond the top of each creek bank.
3. Preparation of Foundations: The ground surface upon which the rip rap is to be placed shall be brought to the correct lines and grades before placement is commenced. Where filling of depressions is required, the new material shall be compacted with hand or mechanical tampers. Unless at creek banks or otherwise shown or specified, rip rap shall begin in a toe ditch constructed in original ground around the toe of the fill or the cut slope. The toe ditch shall be two feet deep in original ground, and the side next to the fill or cut shall have that same slope. After the rip rap is placed, the toe ditch shall be backfilled and the excess dirt spread neatly within the construction easement or on the site.
4. Placement of Plastic Filter Fabric
 - a. Plastic filter fabric shall be placed under all rip rap unless shown or specified otherwise.
 - b. Filter fabric shall not be placed under rip rap on stream or drainage ditch crossings.
 - c. The surface to receive filter fabric shall be prepared to a smooth condition free from obstructions, depressions and debris. The filter fabric shall be installed with the long dimension running up the slope and shall be placed to provide a minimum number of overlaps. The fabric shall be placed to provide a minimum width of one foot of overlap at each joint. The fabric shall be placed so that the upstream strip overlaps the downstream strip. The fabric shall be anchored in place with securing pins of the type recommended by the fabric manufacturer. Pins shall be placed on or within 3-inches of the centerline of the overlap. The fabric shall be placed loosely to avoid stretching and tearing during placement of the stone. The fabric shall be protected at all times during construction from

clogging due to clay, silts, chemicals or other contaminants. Contaminated fabric or fabric damaged during installation or during placement of rip rap shall be removed and replaced with uncontaminated and undamaged fabric at no additional cost to the Owner.

5. Placement of Rip Rap: Rip rap shall be placed on a 6-inch layer of soil, crushed stone or sand overlaying the filter fabric. Rip rap shall be placed with its top elevation conforming with the finished grade or the natural existing slope of the stream bank and stream bottom. The stone shall be dropped no more than three feet during construction.
 - a. Stone Rip Rap: Stone rip rap shall be placed to provide a uniform surface to the thickness shown on the Drawings. The thickness tolerance for the course shall be -3-inches and +6-inches.

E. Gabions

1. Where, in the opinion of the Engineer, the slope of the banks of the stream is too steep to support rip rap, gabions shall be provided, in lieu of rip rap.
2. Gabions shall be assembled according to the manufacturer's recommendations. Laterally adjoining gabions shall be wired together by vertical edges. Vertically adjoining gabions shall be wired together along the front and back edges. Rip rap size for gabion construction shall be large enough not to fall out of gabions, but small enough to form three layers. Gabions shall be placed over a 6-inch layer of soil, crushed stone or sand overlaying a filter fabric.

F. Erosion Control Matting and Blankets

1. Erosion Control Matting and Blankets be placed as shown on the Drawings and as directed by the Engineer.
2. After the site has been shaped and graded to the approved design, prepare a friable seedbed relatively free from clods and rocks more than one inch in diameter, and any foreign material that will prevent contact of the soil stabilization mat with the soil surface. Surface must be smooth to ensure proper contact of blankets or matting to the soil surface. If necessary, redirect any runoff from the ditch or slope during installation.
3. Follow manufacturer's recommendations and follow details as shown on the Drawings for laying and stapling.
4. All erosion control blankets and matting should be inspected periodically following installation, particularly after rainstorms to check for erosion and undermining. Any dislocation or failure should be repaired immediately. If washouts or breakage occurs, reinstall the material after repairing damage to the slope or ditch. Continue to monitor these areas until they become permanently stabilized.

G. Channel Stabilization

1. Where needed, all trees, brush, stumps and other objectionable materials shall be removed so they will not interfere with the construction or proper functioning of the channel.

2. Where possible, trees will be left standing, and stumps will not be removed.
3. Excavation shall be at the locations and grades shown on the Drawings. The lining shall not compromise the capacity of the channel, e.g. the emergency spillway shall be over-excavated so that the lining will be flush with the slope surface.
4. The geotextile shall be placed on a smooth graded surface. The geotextile shall be placed in such a manner that it will not excessively stretch or tear upon placement of the overlying materials. Care should be taken to place the geotextile in intimate contact with the soil such that no void spaces exist between the underlying soil and the geotextile.
5. Construction plans will specifically detail the location and handling of spoils. Spoil material resulting from clearing, grubbing and channel excavation shall be disposed of in a manner which will:
 - a. not cause an increase in flood stage,
 - b. minimize overbank wash,
 - c. not cause an adverse effect on the environmental integrity of the area,
 - d. provide for the free flow of water between the channel and flood plain unless the valley routing and water surface profile are based on continuous dikes being installed,
 - e. leave the right-of-way in the best condition feasible, and
 - f. improve the aesthetic appearance of the site to the extent feasible.
6. Channel linings shall be established or installed immediately after construction or as soon as weather conditions permit.
7. Structures shall be installed according to lines and grades shown on the plan. The foundation for structures shall be cleared of all undesirable materials prior to the installation of the structures.
8. Materials used in construction shall be of permanency commensurate with the design frequency and life expectancy of the facility.
9. Earthfill, when used as a part of the structures, shall be placed according to the installation requirements for sediment basin embankments.
10. Construction operations shall be carried out in such a manner that erosion and air and water pollution will be minimized. State and local laws concerning pollution abatement shall be complied with.
11. Vegetation shall be established on all disturbed areas immediately after construction. If weather conditions cause a delay in establishing vegetation, the area shall be mulched in accordance with the standard for mulching.
12. All temporary access roads or travelways shall be appropriately closed to exclude traffic.

13. Trees and other fallen natural vegetation not causing a deterrent to stream flow should be left for the purpose of habitat.

H. Storm Drain Outlet Protection

1. Ensure that the subgrade for the filter and rip rap follows the required lines and grades shown in the plan. Compact any fill required in the subgrade to the density of the surrounding undisturbed material. Low areas in the subgrade on undisturbed soil may also be filled by increasing the rip rap thickness.
2. The rip rap and gravel filter must conform to the specified grading limits shown in the plans.
3. Geotextile must meet design requirements and be properly protected from punching or tearing during installation. Repair any damage by removing the rip rap and placing another piece of filter fabric over the damaged area. All connecting joints should overlap a minimum of 1 foot. If the damage is extensive, replace the entire filter fabric.
4. Rip rap may be placed by equipment, but take care to avoid damaging the filter.
5. The minimum thickness of the rip rap should be 1.5 times the maximum stone diameter.
6. Construct the apron on zero grade with no overfall at the end. Make the top of the rip rap at the downstream end level with the receiving area or slightly below it.
7. Ensure that the apron is properly aligned with the receiving stream and preferably straight throughout its length. If a curve is needed to fit site conditions, place it in the upper section of the apron.
8. Immediately after construction, stabilize all disturbed areas with vegetation.
9. Filter: Install a filter to prevent soil movement through the openings in the rip rap. The filter should consist of a graded gravel layer or a synthetic filter cloth.
10. Maintenance: Inspect rip rap outlet structures after heavy rains to see if any erosion around or below the rip rap has taken place or if stones have been dislodged. Immediately make all needed repairs to prevent further damage.

I. Temporary Mulching

1. When mulch is used without seeding, mulch shall be applied to provide full coverage of the exposed area. Mulch shall be applied as follows:
 - a. Dry straw or hay mulch and wood chips shall be applied uniformly by hand or by mechanical equipment.
 - b. If the area will eventually be covered with perennial vegetation, 20-30 pounds of nitrogen per acre in addition to the normal amount shall be applied to offset the uptake of nitrogen caused by the decomposition of the organic mulches.

- c. Apply mulch binder on exposed areas, where indicated on the Drawings or as instructed by the Engineer.

2. Anchoring Mulch:

- a. Straw or hay mulch can be pressed into the soil with a disk harrow with the disk set straight or with a special "packer disk." Disks may be smooth or serrated and should be 20 inches or more in diameter and 8 to 12 inches apart. The edges of the disk should be dull enough not to cut the mulch but to press it into the soil leaving much of it in an erect position.
- b. Straw or hay mulch shall be anchored immediately after application.
- c. Straw or hay mulch spread with special blower-type equipment may be anchored with emulsified asphalt (Grade AE-5 or SS-1). The asphalt emulsion shall be sprayed onto the mulch as it is ejected from the machine. Use 100 gallons of emulsified asphalt and 100 gallons of water per ton of mulch.
- d. For straw or hay mulch, plastic mesh or netting with mesh no larger than one inch by one inch shall be installed according to manufacturer's specifications.
- e. Netting of the appropriate size shall be used to anchor wood waste. Openings of the netting shall not be larger than the average size of the wood waste chips.

J. Temporary Grassing

1. Seed Bed Preparation:

- a. When a hydraulic seeder is used, seedbed preparation is not required.
- b. When using conventional or hand seeding, seedbed preparation is not required if the soil material is loose and not sealed by rainfall.
- c. When soil has been sealed by rainfall or consists of smooth cut slopes, the soil shall be pitted, trenched or otherwise scarified to provide a place for seed to lodge and germinate.

2. Select a grass or grass-legume mixture suitable to the area and season of the year.

- 3. Seed shall be applied uniformly by hand, cyclone seeder, drill, culti-packer- seeder, or hydraulic seeder (slurry including seed and fertilizer). Drill or cultipacker seeders should normally place seed one-quarter to one-half inch deep. Appropriate depth of planting is ten times the seed diameter.
- 4. Soil should be "raked" lightly to cover seed with soil if seeded by hand.
- 5. Irrigation: During times of drought, water shall be applied at a rate not causing runoff and erosion. The soil shall be thoroughly wetted to a depth that will insure germination of the seed. Subsequent applications should be made when needed.

6. Temporary Stabilization: Temporary stabilization shall be provided as shown on the Drawings and conforming to these Specifications to control erosion on the site. Temporary stabilization shall be provided to any area which will not receive permanent stabilization within the next 7 calendar days. Partial payment requests may be withheld for those portions of the Project not complying with this requirement.

K. Permanent Grassing

1. Refer to Specifications 32 92 19 Seeding and the seeding table contain within the Drawings for installation and maintenance.
2. Permanent Stabilization:
 - a. Permanent stabilization shall be provided as shown on the Drawings and conforming to these Specifications to control erosion on the site. Permanent stabilization shall be provided to all areas of land disturbance within seven calendar days of the completion of land disturbance for any area greater than 0.25 acre.
 - b. Grass or sod removed or damaged in residential areas shall be replanted with the same variety within seven calendar days of the completion of work in any area.
 - c. Where permanent stabilization cannot be immediately established because of an inappropriate season, the Contractor shall provide temporary stabilization. The Contractor shall return to the site at the appropriate season to provide permanent stabilization in areas that received only temporary stabilization.

L. Sediment Traps

1. Installation:
 - a. The embankment should be compacted in 6-inch layers by traversing with construction equipment.
 - b. All cut and fill slopes should be 2:1 or less (except for excavated, wet storage area which may be at a maximum 1:1. grade).
 - c. Construction operations should be carried out in such a manner that erosion during construction of the structure is minimized.
 - d. The earthen embankment should be seeded with temporary or permanent seeding immediately after installation.
2. Removal: The structure should be removed and the area stabilized when the upslope drainage area has been stabilized.
3. Maintenance:
 - a. Sediment should be removed and the trap restored to its original dimensions

when the sediment has accumulated to one half the design volume of the wet storage. Sediment removal from the basin should be deposited in a suitable area and in such a manner that it will not erode and cause sedimentation problems.

- b. Maintenance needs identified in inspections or by other means should be accomplished before the next storm event if possible, but in no case more than seven days after the need is identified.

3.3 CLEAN-UP

- A. Dispose of all excess erosion and sedimentation control materials in a manner satisfactory to the Engineer.
- B. All temporary erosion control measures shall be removed after final stabilization of the site has occurred, unless otherwise noted on the Drawings or instructed by the Engineer.
- C. Final clean-up shall be performed in accordance with the requirements of Section 017400 of these Specifications.

END OF SECTION 015713

SECTION 313716.13 – RUBBLE-STONE RIPRAP

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Riprap placed loose.
- B. Related Requirements:
 - 1. Supplemental Specifications
 - a. Section 310519 – Geotextiles for Earthwork

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. Section 012000 - Price and Payment Procedures.

1.3 COORDINATION

- A. Section 013000 - Administrative Requirements: Requirements for coordination.
- B. Coordinate Work of this Section with rough grading, excavating and utilities Work.

1.4 PREINSTALLATION MEETINGS

- A. Section 013000 - Administrative Requirements: Requirements for preinstallation meeting.
- B. Convene minimum one week prior to commencing Work of this Section.

1.5 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit manufacturer information regarding size distribution and types for rock for riprap.
- C. Samples – **(NOT USED)**
 - 1. Submit one 10-lb. sample(s) of riprap materials to testing laboratory.
 - 2. Submit in airtight containers.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Qualifications Statement:

1. Submit qualifications for manufacturer.

1.6 SUSTAINABLE DESIGN SUBMITTALS – (NOT USED)

1.7 QUALITY ASSURANCE

- A. Furnish each aggregate material from single source throughout Work of this Section.
- B. Rip rap shall be as per Section 805 of Georgia Department of Transportation Standard Specifications.

1.8 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' documented experience.

PART 2 - PRODUCTS

2.1 SUSTAINABILITY CHARACTERISTICS - (NOT USED)

2.2 MATERIALS

- A. Riprap:
 1. Description:
 - a. Rip rap shall be constructed using sound, dense, durable stones, or rock fragments, free from cracks, pyrite intrusions and other structural defects that would tend to increase unduly their destruction by water and frost action. Stones shall be free from dirt, oil, or other foreign material.
 - b. Rip rap shall be processed in such a manner as to produce a uniformly distributed, quarry-run material including rock fines.
 - c. Shape of the stones shall be generally rectangular or cubic. Flat or elongated stones having a small dimension less than 1/3 of the large dimension shall not be used.
 - d. Rip rap size shall be as indicated on the drawings

PART 3 - EXECUTION

3.1 APPLICATION

- A. Do not place riprap over frozen or spongy subgrade surfaces.

- B. Place filter fabric over approved subgrade, lap edges and ends, a minimum of 18 inches.
- C. Place 6 inch thick stone bedding (#57 stone) over filter fabric.
- D. Stone bedding shall be carefully placed on filter fabric and spread to a uniform thickness. Dumping of the stone directly on the filter fabric should be avoided.
- E. No construction vehicles or equipment will be allowed directly on the fabric.
- F. Place riprap where indicated on Drawings.
- G. Place riprap into position and remove foreign material from surfaces.
- H. Place required sized rip rap to the thickness indicated on the drawings.
- I. Place rock evenly and carefully in one consistent operation to preclude disturbance or displacement of substrate.
- J. The rip rap need not be compacted but shall be placed to grade in a manner to insure that the larger fragments are uniformly distributed and the smaller fragments serve to fill the spaces between the larger rock fragments in such a manner as will result in well-keyed, densely-placed, uniform layers of rip rap of the specified thickness. Hand placing will be required only to the extent necessary to secure the results specified above.
- K. The rock shall be placed as close to final position and as neatly as possible using powered equipment.
- L. The CONTRACTOR's placement techniques will be subject to the approval of the OWNER's Representative.
- M. The finished rip rap surface shall conform to the slope lines shown on the Drawings. No objectionable, hazardous, or unsightly projections above the general plane surface will be permitted.
- N. All structures shall be carefully protected from damage by equipment or impact of stones. All damage shall be corrected by the CONTRACTOR at his own expense.

3.2 ATTACHMENTS

- A. N/A.

END OF SECTION 313716.13

SECTION 329113 - SOIL PREPARATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Preparation of subsoil.
 - 2. Soil testing.
 - 3. Placing topsoil.
- B. Related Sections:
 - 1. Section 312333 – Trenching and Backfilling
 - 2. Section 329219 - Seeding

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

- 1. Section 012000 – Price and Payment Procedures

1.3 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Submit minimum 10 oz sample of topsoil proposed. Forward sample to approved testing laboratory in sealed containers to prevent contamination. (NOT USED)
- C. Test Reports: Indicate topsoil nutrient and pH levels with recommended soil supplements and application rates.
- D. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.4 SUSTAINABLE DESIGN SUBMITTALS – (NOT USED)

- A. Section 018113 - Sustainable Design Requirements: Requirements for sustainable design submittals.
- B. Manufacturer's Certificate: Certify products meet or exceed specified sustainable design requirements.
 - 1. Materials Resources Certificates:
 - a. Certify source for regional materials and distance from Project site.

- C. Product Cost Data: Submit cost of products to verify compliance with Project sustainable design requirements. Exclude cost of labor and equipment to install products.
 - 1. Provide cost data for the following products:
 - a. Regional products.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with municipal and current industry standards.
- B. Maintain one copy of each document on site.

1.6 COORDINATION

- A. Section 013000 - Administrative Requirements: Requirements for coordination.
- B. Coordinate with installation of underground sprinkler system piping and watering heads.

PART 2 - PRODUCTS

2.1 SUSTAINABILITY CHARACTERISTICS – (NOT USED)

- A. Section 018113 - Sustainable Design Requirements: Requirements for sustainable design compliance.
- B. Materials and Resources Characteristics:
 - 1. Regional Materials: Furnish materials extracted, processed, and manufactured within the state of Georgia.

2.2 SOIL MATERIALS

- A. Topsoil: Fertile, agricultural soil, typical for locality, capable of sustaining vigorous plant growth, taken from drained site; free of subsoil, clay or impurities, plants, weeds and roots; pH value of minimum 5.4 and maximum 7.0.

2.3 ACCESSORIES

- A. Edging: As indicated on Drawings.

2.4 SOURCE QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Testing, inspection and analysis requirements.

- B. Analyze to ascertain percentage of nitrogen, phosphorus, potash, soluble salt content, organic matter content, and pH value.
- C. Provide recommendation for fertilizer and lime application rates for specified seed mix as result of testing.
- D. Testing is not required when recent tests and certificates are available for imported topsoil. Submit these test results to testing laboratory. Indicate, by test results, information necessary to determine suitability.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 013000 - Administrative Requirements: Verification of existing conditions before starting work.
- B. Verify prepared soil base is ready to receive the Work of this section.

3.2 PREPARATION OF SUBSOIL

- A. Prepare sub-soil to eliminate uneven areas and low spots. Maintain lines, levels, profiles and contours. Make changes in grade gradual. Blend slopes into level areas.
- B. Remove foreign materials, weeds and undesirable plants and their roots. Remove contaminated sub-soil.
- C. Scarify subsoil to depth of 3 inches where topsoil is to be placed. Repeat cultivation in areas where equipment, used for hauling and spreading topsoil, has compacted sub-soil.

3.3 PLACING TOPSOIL

- A. Spread topsoil to minimum depth of 4 inches over area to be seeded. Rake until smooth.
- B. Place topsoil during dry weather and on dry unfrozen subgrade.
- C. Remove vegetable matter and foreign non-organic material from topsoil while spreading.
- D. Grade topsoil to eliminate rough, low or soft areas, and to ensure positive drainage.
- E. Install edging at periphery of seeded areas in straight lines to consistent depth.

END OF SECTION 329113

**SECTION 329119
LANDSCAPE GRADING**

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Final grade topsoil for finish landscaping.
- B. Related Sections:
 - 1. Section 310513 – Soils for Earthwork
 - 2. Section 310516 – Aggregates for Earthwork
 - 3. Section 310519.33 – Geotextiles for Earthwork
 - 4. Section 312213 – Rough Grading
 - 5. Section 312323 - Fill
 - 6. Section 312333 – Trenching and Backfilling
 - 7. Section 329219 – Seeding
 - 8. Section 3292233 - Sodding

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

- A.
 - 1. Section 012000 – Price and Payment Procedures

1.3 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures
- B. Samples: Submit, in air-tight containers, 10 lb sample of each type of fill to testing laboratory.
- C. Materials Source: Submit name of imported materials source.
- D. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.4 SUSTAINABLE DESIGN SUBMITTALS – (NOT USED)

- A. Section 018113 - Sustainable Design Requirements: Requirements for sustainable design submittals.
- B. Manufacturer's Certificate: Certify products meet or exceed specified sustainable design requirements.
 - 1. Materials Resources Certificates:
 - a. Certify source for regional materials and distance from Project site.
- C. Product Cost Data: Submit cost of products to verify compliance with Project sustainable design requirements. Exclude cost of labor and equipment to install products.
 - 1. Provide cost data for the following products:
 - a. Regional products.

1.5 QUALITY ASSURANCE

- A. Furnish each topsoil material from a single source throughout the Work.
- B. Perform Work in accordance with Authority and current industry standards.

PART 2 - PRODUCTS

2.1 SUSTAINABILITY CHARACTERISTICS – (NOT USED)

- A. Section 018113 - Sustainable Design Requirements: Requirements for sustainable design compliance.
- B. Materials and Resources Characteristics:
 - 1. Regional Materials: Furnish materials extracted, processed, and manufactured within state of Georgia.

2.2 MATERIAL

- A. Topsoil: As specified in Section 329113, 2.2, A – Soil Preparation.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 013000 - Administrative Requirements: Verification of existing conditions before starting work.
- B. Verify building and trench backfilling have been inspected.
- C. Verify substrate base has been contoured and compacted.

3.2 PREPARATION

- A. Protect landscaping and other features remaining as final Work.
- B. Protect existing structures, fences, sidewalks, utilities, paving and curbs.

3.3 SUBSTRATE PREPARATION

- A. Eliminate uneven areas and low spots.
- B. Remove debris, roots, branches, stones, in excess of 1/2 inch in size. Remove contaminated subsoil.
- C. Scarify surface to depth of 4 inches where topsoil is scheduled. Scarify in areas where equipment used for hauling and spreading topsoil has compacted subsoil.

3.4 PLACING TOPSOIL

- A. Place topsoil in areas where seeding, sodding, planting is required to thickness as scheduled. Place topsoil during dry weather.
- B. Fine grade topsoil to eliminate rough or low areas. Maintain profiles and contour of subgrade.
- C. Remove roots, weeds, rocks, and foreign material while spreading.
- D. Manually spread topsoil close to plant material, buildings and structures to prevent damage.
- E. Lightly compact placed topsoil.
- F. Remove surplus subsoil and topsoil from site.
- G. Leave stockpile area and site clean and raked, ready to receive landscaping.

3.5 TOLERANCES

- A. Section 014000 - Quality Requirements: Tolerances.

- B. Top of Topsoil: Plus or minus 1/2 inch.

3.6 PROTECTION OF INSTALLED WORK

- A. Section 017000 - Execution and Closeout Requirements: Requirements for protecting finished Work.
- B. Prohibit construction traffic over topsoil.

3.7 SCHEDULES

- A. Compacted topsoil thicknesses:
 - 1. Seeded Grass: 4 inches.
 - 2. Sod: 4 inches.
 - 3. Shrub Beds: 18 inches.
 - 4. Flower Beds: 12 inches.
 - 5. Planter Boxes: To within 3 inches of box rim.

END OF SECTION 329119

SECTION 329219 – SEEDING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Seeding of disturbed areas
- B. Fertilizing and soil amendments, as necessary.
- C. Maintenance

1.2 REFERENCES

- A. U.S. Department of Agriculture (USDA)
 - 1. AMS Seed Act (1940; R 1988; R 1998) Federal Seed Act
 - 2. DOA SSIR 42 (1996) Soil Survey Investigation Report No. 42, Soil Survey Laboratory Methods Manual, Version 3.0

1.3 DEFINITIONS

- A. Acceptable Stand of Turf: An area is considered acceptable if it is represented by a minimum of 100 seedlings per square foot of the permanent species of grass representative of the seed mixture.

1.4 RELATED REQUIREMENTS

- A. Section 329113 – Soil Preparation

1.5 SUBMITTALS

- A. The following shall be submitted in accordance with Section 013300 - Submittal Procedures:
 - 1. Product Data:
 - a. Wood cellulose fiber mulch.
 - b. Fertilizer: Include physical characteristics, and recommendations.
 - 2. Certificates:
 - a. Contractor shall furnish labels or certified laboratory reports from an accredited commercial seed laboratory or a state seed laboratory showing the analysis and germination of the seed to be furnished. Acceptance of the seed test reports shall not

relieve the Contractor of any responsibility or liability for furnishing seed meeting the requirements of this section.

3. Test Results:

- a. The Contractor shall obtain representative samples and furnish soil test certificates including textural, pH, and organic ignition analysis from the State University Agricultural Extension Service or other certified testing laboratory.

1.6 SYSTEM DESCRIPTION

- A. This work shall be performed in all disturbed areas not receiving such site improvements as buildings, roads, walks, sod, planting, etc., and shall include, but not necessarily be limited to, all seed bed preparation; the supplying and placing of soil additives, seed, and mulch wherever required by the Drawings or directed by the Engineer; and maintenance.
- B. All existing lawns encountered shall be replaced with topsoil and seeding of the same type and quality as that existing prior to construction and shall be restored to original condition or better.
- C. Unless otherwise approved in writing by the Engineer, seeding operations shall be limited to the following planting periods:
 1. Spring - March 1 through May 30
 2. Fall - August 15 through October 31
- D. Seeding Requirements
 1. When seeding during March 1 through April 1 and October 1 through November 20, add an additional 3 pounds per 1,000 square feet of annual rye grass.
 2. Low Maintenance mix of Weeping Lovegrass, Common Bermuda, Bahai, or Fescue. Mix with tall Fescue or Winter Annuals.
 3. Temporary and permanent seeding and fertilizer rates are provided on Drawing No. 98-ECS.01 in accordance with the latest edition of the Manual for Sediment Control in Georgia.
- E. Refer to other sections for items affecting seeding. Coordinate this work with that specified by other sections for timely execution.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Delivery
 1. Seed Protection: Protect from drying out and from contamination during delivery, on-site storage, and handling.
 2. Fertilizer and Other Agricultural Chemicals Delivery: Deliver to the site in original, unopened containers bearing manufacturer's chemical analysis, name, trade name,

trademark, and indication of conformance to state and federal laws. Instead of containers, fertilizer may be furnished in bulk with certificate indicating the above information.

B. Storage

1. Seed Storage: Store in cool, dry locations away from contaminants.
2. Topsoil: Prior to stockpiling topsoil, treat growing vegetation with application of appropriate specified non-selective herbicide. Clear and grub existing vegetation three to four weeks prior to stockpiling topsoil.

C. Handling: Do not drop or dump materials from vehicles.

PART 2 - PRODUCTS

2.1 TOPSOIL

- A. On-Site Topsoil: Surface soil stripped and stockpiled on site and modified as necessary to meet the requirements specified for topsoil in paragraph entitled "Composition." When available, topsoil shall be existing surface soil stripped and stockpiled on-site in accordance with Section 310513 – Soils for Earthwork.
- B. Off-Site Topsoil: Conform to requirements specified in paragraph entitled "Composition." Additional topsoil shall be furnished by the Contractor.
- C. Composition: Containing from 5 to 20 percent organic matter as determined by the topsoil composition tests of the Organic Carbon, 6A, Chemical Analysis Method described in DOA SSIR 42. Maximum particle size, 3/4 inch, with maximum 3 percent retained on 1/4 inch screen. The pH shall be tested in accordance with ASTM D4972. Topsoil shall be free of sticks, stones, roots, and other debris and objectionable materials. Other components shall conform to the following limits:

Silt	25-50 percent
Clay	10-30 percent
Sand	20-35 percent
pH	5.5 to 7.0
Soluble Salts	600 ppm maximum

2.2 GRASS SEED

- A. Seed shall be delivered in new bags or bags that are sound and labeled in accordance with the U.S. Department of Agriculture Federal Seed Act.
- B. All seed shall be from the last crop available at time of purchase and shall not be moldy, wet, or otherwise damaged in transit or storage.
- C. Seed shall bear the growers analysis testing to 98% for purity and 90% for germination. At the discretion of the Engineer, samples of seed may be taken for check against the grower's analysis.
- D. Species, rate of seeding, fertilization, and other requirements are shown on Drawing No. 98-EC5.01.

2.3 FERTILIZER MATERIALS

- A. Fertilizer materials shall comply with applicable state, local, and federal laws concerned with their production and use.
- B. Commercial fertilizer shall be a ready mixed material and shall be equivalent to the grade or grades specified on Drawing No. 98-EC5.01. Container bags shall have the name and address of the manufacturer, the brand name, net weight, and chemical composition.

2.4 AGRICULTURAL LIMESTONE:

- A. Containing a minimum of 85 percent calcium carbonate and magnesium carbonate combined, 85 percent of which passes a No. 10 mesh sieve, and 40 percent passing a No. 40 mesh sieve.

2.5 MULCH:

- A. Mulch shall be free from noxious weeds, mold, and other deleterious materials.
- B. Straw: Stalks from oats, wheat, rye, barley, or rice. Furnish in air-dry condition and of proper consistency for placing with commercial mulch blowing equipment. Straw shall contain no fertile seed.

2.6 MULCH BINDER

- A. Mulch on slopes exceeding 3 to 1 ratio shall be held in place by the use of an approved mulch binder. The mulch binder shall be non-toxic to plant life and shall be acceptable to the Engineer.
- B. Emulsified asphalt binder shall be Grade SS-1, ASTM D 977. Cut-back asphalt binder shall be Grade RC 70 or RC 250.

2.7 INOCULANTS FOR LEGUMES

- A. All leguminous seed shall be inoculated prior to seeding with a standard culture of nitrogen-fixing bacteria that is adapted to the particular seed involved.

2.8 WATER

- A. Water shall be clean, clear water free from any objectionable or harmful chemical qualities or organisms and shall be furnished by the Contractor.

PART 3 - EXECUTION

3.1 PREPARATION

- A. **EXTENT OF WORK:** Provide soil preparation (including soil conditioners as required), fertilizing, seeding, and surface topdressing of all newly graded finished earth surfaces, unless indicated otherwise, and at all areas inside or outside the limits of construction that are disturbed by the Contractor's operations.
- B. **Topsoil:** Provide 4 inches of off-site topsoil to meet indicated finish grade. Over rock, provide minimum of 12 inches of topsoil. After areas have been brought to indicated finish grade,

incorporate fertilizer, pH adjusters, and soil conditioners into soil a minimum depth of 4 inches by disking, harrowing, tilling or other method approved by the Engineer. Remove debris and stones larger than 3/4 inch in any dimension remaining on the surface after finish grading. Correct irregularities in finish surfaces to eliminate depressions. Protect finished topsoil areas from damage by vehicular or pedestrian traffic.

- C. Before beginning seeding operations in any area, complete the placing of topsoil and final grading, and have the work approved by the Owner's Representative.

3.2 SEEDING

A. Seed Application and Conditions

1. Immediately before seeding, restore soil to proper grade.
2. Do not seed when ground is muddy frozen or in an unsatisfactory condition for seeding.
3. Apply seed within twenty-four hours after seedbed preparation.
4. Sow seed by approved sowing equipment. Sow one-half the seed in one direction, and sow remainder at right angles to the first sowing.

- B. Seed of the specified group shall be sown as soon as preparation of the seedbed has been completed. No seed shall be sown during high winds, nor until the surface is suitable for working and is in a proper condition. Seeding shall be performed during the dates shown in the Seeding Requirements Table unless otherwise approved by the Engineer. Seed mixtures may be sown together provided they are kept in a thoroughly mixed condition during the seeding operation. Copies of all weight tickets shall be furnished to the Engineer.

- C. Seeds shall be uniformly sown by any approved mechanical method to suit the slope and size of the areas to be seeded, preferably with a broadcast type seeder, windmill hand seeder, or approved mechanical power drawn seed drills. Hydro-seeding and hydro-mulching may be used on steep embankments, provided full coverage is obtained. Care shall be taken to adjust the seeder for seeding at the proper rate before seeding operations are started and to maintain their adjustment during seeding. Seed in hoppers shall be agitated to prevent segregation of the various seeds in a seeding mixture.

- D. Immediately after sowing, the seeds shall be covered and compacted to a depth of 1/8 to 3/8 inch by a cultipacker or suitable roller.

- E. Leguminous seeds shall be inoculated prior to seeding with an approved and compatible nitrogen-fixing inoculant in accordance with the manufacturer's mixing instructions.

3.3 MULCHING

- A. All seeded areas shall be uniformly mulched in a continuous blanket immediately after seeding. The mulch shall be applied so as to permit some sunlight to penetrate and the air to circulate and at the same time shade the ground, reduce erosion, and conserve soil moisture. Approximately 25 percent of the ground shall be visible through the mulch blanket.

- B. One of the following mulches shall be spread evenly over the seeded areas at the following application rates:

- | | |
|-------------------------|-----------------|
| 1. Wood Cellulose Fiber | 1,400 lbs./acre |
| 2. Stalks | 4,000 lbs./acre |
| 3. Straw | 4,000 lbs./acre |

These rates may be adjusted at the discretion of the Engineer at no additional cost to the Owner, depending on the texture and condition of the mulch material and the characteristics of the seeded area.

- C. Mulch on slopes greater than 3 to 1 ratio shall be held in place by the use of an approved mulch binder. Binder shall be thoroughly mixed and applied with the mulch. Emulsified asphalt or cutback asphalt shall be applied at the approximate rate of 5 gallons per 1,000 square feet as required to hold the mulch in place.
- D. The Contractor shall cover structures, poles, fence, and appurtenances if the mulch binder is applied in such a way that it would come in contact with or discolor the structures.
- E. Mulch and binder shall be applied by suitable blowing equipment at closely controlled application rates.

3.4 WATERING

- A. Contractor shall be responsible for maintaining the proper moisture content of the soil to insure adequate plant growth until a satisfactory stand is obtained. If necessary, watering shall be performed to maintain adequate water content in the soil.
- B. Watering shall be accomplished by hoses, tank trucks, or sprinklers in such a way to prevent erosion, excessive runoff, and overwatered spots.

3.5 MAINTENANCE AND BOND

- A. Upon completion of seeding operations, the Contractor shall clear the area of all equipment, debris, and excess material and the premises shall be left in a neat and orderly condition.
- B. No equipment, material storage, construction traffic, etc., will be permitted on newly seeded ground.
- C. The Contractor shall maintain all seeded areas without additional payment until final acceptance of the work by the Owner. Seeding work shall be repeated on defective areas until a satisfactory uniform stand is accomplished. Damage resulting from erosion, gullies, washouts, or other causes shall be repaired by filling with topsoil, compacting, and repeating the seeding work at contractor's expense.

3.6 FIELD QUALITY CONTROL

- A. The Owner's Representative shall inspect the seeding within 60 days after planting and determine if an acceptable stand of grass has been produced.
- B. If an acceptable growth is not obtained on the first planting, reseeding and remulching will be required.
- C. If the planting is less than 50 percent successful, rework the ground, refertilize, reseed, and remulch.

END OF SECTION 329219

SECTION 334200
STORMWATER CONVEYANCE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Stormwater drainage piping.
2. Manholes.
3. Catch basins.
4. Cleanouts.
5. Pile support systems.
6. Concrete encasement and cradles.
7. Bedding and cover materials.

B. Related Requirements:

1. Section 032000 - Concrete Reinforcing: Reinforcement of concrete cradles.
2. Section 033000 - Cast-in-Place Concrete.
3. Section 036000 - Grouting: Cementitious grout.
4. Section 310513 - Soils for Earthwork: Soils for backfill in trenches.
5. Section 310516 - Aggregates for Earthwork: Aggregate for backfill in trenches.
6. Section 310519.13 - Geotextiles for Earthwork: Geotextile filter fabric.
7. Section 312333 – Trenching and Backfilling: Requirements for backfill to be placed under this Section.
8. Section 330561 - Concrete Manholes: Manholes and accessories as required by this Section.

1.2 DEFINITIONS

- A. ABS: Acrylonitrile butadiene styrene.

1.3 UNIT PRICE - MEASUREMENT AND PAYMENT

A.

1. Section 012000 – Price and Payment Procedures

1.4 REFERENCE STANDARDS

A. American Association of State Highway and Transportation Officials:

1. AASHTO M036 - Standard Specification for Corrugated Steel Pipe, Metallic-Coated, for Sewers and Drains.
2. AASHTO M196 - Standard Specification for Corrugated Aluminum Pipe for Sewers and Drains.
3. AASHTO M218 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized), for Corrugated Steel Pipe.
4. AASHTO M245 - Standard Specification for Corrugated Steel Pipe, Polymer-Precoated, for Sewers and Drains.
5. AASHTO M246 - Standard Specification for Steel Sheet, Metallic-Coated and Polymer-Precoated, for Corrugated Steel Pipe.
6. AASHTO M252 - Standard Specification for Corrugated Polyethylene Drainage Pipe.
7. AASHTO M274 - Standard Specification for Steel Sheet, Aluminum-Coated (Type 2), for Corrugated Steel Pipe.
8. AASHTO M288 - Standard Specification for Geotextile Specification for Highway Applications.
9. AASHTO M289 - Standard Specification for Aluminum-Zinc Alloy Coated Sheet Steel for Corrugated Steel Pipe.
10. AASHTO M294 - Standard Specification for Corrugated Polyethylene Pipe, 300- to 1500-mm (12- to 60-in.) Diameter.
11. AASHTO T241 - Standard Method of Test for Helical Continuously Welded Seam Corrugated Steel Pipe.
12. AASHTO T 180 - Standard Method of Test for Moisture-Density Relations of Soils Using a 10-lb Rammer and a 18-in. Drop.

B. ASTM International:

1. ASTM A74 - Standard Specification for Cast Iron Soil Pipe and Fittings.

2. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
3. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
4. ASTM A746 - Standard Specification for Ductile Iron Gravity Sewer Pipe.
5. ASTM B745 - Standard Specification for Corrugated Aluminum Pipe for Sewers and Drains.
6. ASTM C14 - Standard Specification for Nonreinforced Concrete Sewer, Storm Drain, and Culvert Pipe.
7. ASTM C76 - Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
8. ASTM C443 - Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets.
9. ASTM C564 - Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings.
10. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort 12,400 ft-lbf/ft³.
11. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort 56,000 ft-lbf/ft³.
12. ASTM D2235 - Standard Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings.
13. ASTM D2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.
14. ASTM D2564 - Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems.
15. ASTM D2680 - Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) and Poly(Vinyl Chloride) (PVC) Composite Sewer Piping.
16. ASTM D2729 - Standard Specification for Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
17. ASTM D2855 - Standard Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets.
18. ASTM D3034 - Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.

19. ASTM D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
20. ASTM F405 - Standard Specification for Corrugated Polyethylene (PE) Pipe and Fittings.
21. ASTM F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
22. ASTM F667 - Standard Specification for 3 through 24 in. Corrugated Polyethylene Pipe and Fittings.

1.5 COORDINATION

- A. Section 013000 - Administrative Requirements: Requirements for coordination.
- B. Coordinate Work of this Section with termination of storm sewer connection outside building, trenching, connection to foundation drainage system, municipal sewer utility service.

1.6 PREINSTALLATION MEETINGS

- A. Section 013000 - Administrative Requirements: Requirements for preinstallation meeting.
- B. Convene minimum one week prior to commencing Work of this Section.

1.7 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit manufacturer information describing pipe, pipe accessories.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Manufacturer Instructions: Submit special procedures required to install specified products.
- E. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
- F. Qualifications Statement:
 1. Submit qualifications for manufacturer.

1.8 SUSTAINABLE DESIGN SUBMITTALS - (NOT USED)

- A. Section 018113 - Sustainable Design Requirements: Requirements for sustainable design submittals.
- B. Manufacturer's Certificate:
 1. Certify that products meet or exceed specified sustainable design requirements.

2. Materials Resources Certificates:

- a. Certify source and origin for salvaged and reused products.
- b. Certify recycled material content for recycled content products.
- c. Certify source for regional materials and distance from Project Site.

C. Product Cost Data:

- 1. Submit cost of products to verify compliance with Project sustainable design requirements.
- 2. Exclude cost of labor and equipment to install products.
- 3. Provide cost data for following products:
 - a. Salvaged, refurbished, and reused products.
 - b. Products with recycled material content.
 - c. Regional products.

1.9 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.
- B. Project Record Documents: Record actual locations of pipe runs, connections, catch basins, cleanouts, and invert elevations.
- C. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.10 QUALITY ASSURANCE

- A. Perform Work according to Georgia Department of Transportation standards.
- B. Maintain one copy of each standard affecting Work of this Section on Site.

1.11 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' documented experience.

1.12 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Store materials according to manufacturer instructions.

D. Protection:

1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
2. Provide additional protection according to manufacturer instructions.

1.13 EXISTING CONDITIONS

A. Field Measurements:

1. Verify field measurements prior to fabrication.
2. Indicate field measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 STORM DRAINAGE PIPING

A. Reinforced Concrete Piping:

1. Pipe:
 - a. Comply with ASTM C76, Class I, II, III, IV, or V, with Wall Type A, B, or C, pending applicable.
 - b. Reinforcement: Bar.
 - c. Inside Nominal Diameter: as indicated on Drawings.
 - d. End Connections: Bell and spigot.
2. Fittings: Reinforced concrete.
3. Joints:
 - a. Comply with ASTM C443.
 - b. Gaskets: Rubber, compression.

B. ADS HP Piping: (NOT USED)

1. Pipe:
 - a. Comply with Georgia Department of Transportation standards.
 - b. Inside Nominal Diameter: As indicated on drawings.
 - c. End Connections: Bell and spigot, solvent sealed.
2. Fittings: ABS.
3. Joints:
 - a. Type: Solvent weld.

- b. Comply with ASTM D2235.
- C. Corrugated HDPE Piping: (NOT USED)
 - 1. Pipe:
 - a. Comply with ASTM F667.
 - b. Type: Smooth interior.
 - c. Inside Nominal Diameter: as indicated on Drawings.
 - 2. Fittings: HDPE.
 - 3. Joints: Comply with ASTM 667.

2.2 MANHOLES (NOT USED)

2.3 CATCH BASINS (NOT USED)

2.4 CLEANOUTS (NOT USED)

2.5 PILE SUPPORT SYSTEMS (NOT USED)

2.6 CONCRETE ENCASEMENT AND CRADLES (NOT USED)

2.7 SUSTAINABILITY CHARACTERISTICS – (NOT USED)

- A. Section 018113 - Sustainable Design Requirements: Requirements for sustainable design compliance.
- B. Material and Resource Characteristics:
 - 1. Recycled Content Materials: Furnish materials with maximum available recycled content.
 - 2. Regional Materials: Furnish materials extracted, processed, and manufactured within 500 miles of Project Site.

2.8 MATERIALS

- A. Bedding and Cover:
 - 1. Bedding: Fill Type; as specified in Section 310516 - Aggregates for Earthwork.
 - 2. Cover: Fill Type; as specified in Section 310516 - Aggregates for Earthwork.

3. Soil Backfill from above Pipe to Finish Grade: Soil Type; as specified in Section 310513 - Soils for Earthwork.
4. Subsoil: No rocks more than 6 inches in diameter, frozen earth, or foreign matter.

2.9 MIXES

- A. Grout: As specified in Section 036000 - Grouting.

2.10 FINISHES

- A. Steel Galvanizing:
 1. Comply with ASTM A123.
 2. Hot-dip galvanized after fabrication.
- B. Galvanizing for Nuts, Bolts, and Washers: Comply with ASTM A153.

2.11 ACCESSORIES

- A. Geotextile Filter Fabric:
 1. Comply with AASHTO M288 for subsurface drainage.
 2. Type:
 - a. Class A, non-biodegradable.
 - b. Non-woven.
- B. Pipe Support Brackets: Galvanized structural steel coated with bituminous paint.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.
- B. Verify that trench cut is ready to receive Work of this Section.
- C. Verify that excavations, dimensions, and elevations are as indicated on Drawings.

3.2 PREPARATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation preparation.
- B. Correct over-excavation with lean concrete.
- C. Remove large stones and other hard matter that could damage piping or impede consistent backfilling or compaction.

3.3 INSTALLATION

- A. Excavation and Bedding:
 - 1. Excavate trench to 12 inches below pipe invert, and as specified in Section 321333.
 - 2. Hand trim excavation for accurate placement of piping to indicated elevations.
 - 3. Place bedding material at trench bottom.
 - 4. Level materials in continuous layers not exceeding 6-inch compacted depth.
 - 5. Maintain optimum moisture content of bedding material to attain required compaction density.
 - 6. Level fill materials in continuous layers not exceeding 6 inches in depth, and compact to 95 percent maximum density.
 - 7. Place geotextile fabric over compacted bedding.
 - 8. Install pipe supports and anchors.
- B. Piping:
 - 1. Pipe, Fittings, and Accessories: Comply with ASTM D2321.
 - 2. Seal joints watertight.
 - 3. Place pipe in accordance with Drawings.
 - 4. Cradle bottom 20 percent of pipe diameter to avoid point load.
 - 5. Install aggregate at sides and over top of pipe.
 - 6. Install top cover to minimum compacted thickness of 12 inches, and compact to 95 percent maximum density.
 - 7. Backfilling and Compaction:
 - a. As specified in Section 312393 – Trenching and Backfilling.
 - b. Do not displace or damage pipe while compacting.

8. Pipe Markers: in accordance with industry standards.
9. Installation Standards: Install Work according to GDOT standards.

3.4 TOLERANCES

- A. Section 014000 - Quality Requirements: Requirements for tolerances.
- B. Maximum Variation from Indicated Pipe Slope: 1/8 inch in 10 feet.

3.5 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Requirements for inspecting and testing.
- B. Request inspection by Engineer prior to and immediately after placing aggregate cover over pipe.
- C. Inspection:
 1. Request inspection by Engineer prior to and immediately after placing aggregate cover over pipe.
- D. Testing:
 1. Compaction Test:
 - a. Comply with AASHTO T 180.
 2. If tests indicate that Work does not meet specified requirements, remove Work, replace, and retest.

3.6 PROTECTION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for protecting finished Work.
- B. Protect pipe and aggregate cover from damage or displacement until backfilling operation is in progress.

3.7 ATTACHMENTS

- A. N/A.

END OF SECTION 334200