

**CITY OF CANTON
OLD BALLGROUND
SANITARY SEWER REPLACEMENT PHASE 2
AND THE ETOWAH RIVER TRAIL EXTENSION**

AUGUST 2020



ATKINS

1600 Riveredge Parkway NW, Suite 700
Atlanta, Georgia 30328
Phone: 770-933-0280
Fax: 770-933-9946
Atkins Project No.: 100065927

INDEX

PAGE

DIVISION 0 - BIDDING AND CONTRACT REQUIREMENTS

SECTION

00010	ADVERTISEMENT FOR BIDDERS	00010-1
00100	INSTRUCTIONS TO BIDDERS	00100-1
00410	BID FORM	00410-1
00410	BID PROPOSAL	00410-4
00430	BID BOND	00430-1
00520	AGREEMENT	00520-1
Exhibit A	NON-COLLUSION AFFIDAVIT OF BIDDER	Exhibit A
Exhibit B	AFFIDAVIT	Exhibit B
Exhibit C	SECURITY AND IMMIGRATION COMPLIANCE ACT CERTIFICATION	Exhibit C
Exhibit D	CONTRACTOR AFFIDAVIT	Exhibit D
Exhibit E	SUBCONTRACTOR AFFIDAVIT	Exhibit E
00610	PERFORMANCE BOND	00610-1
00615	PAYMENT BOND	00615-1
00700	STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT	00700-1
00800	SUPPLEMENTARY CONDITIONS	00800-1

DIVISION 1 - GENERAL REQUIREMENTS

01012	MOBILIZATION AND DEMOBILIZATION	01012-1
01050	FIELD ENGINEERING BY CONTRACTOR	01050-1
01060	REGULATORY REQUIREMENTS	01060-1
01150	MEASUREMENT AND PAYMENT	01150-1
01152	APPLICATIONS FOR PAYMENT	01152-1
01300	SUBMITTALS	01300-1
01311	CONSTRUCTION SCHEDULES AND MEETINGS	01311-1
01340	SHOP DRAWINGS, PRODUCT DATA AND SAMPLES	01340-1
01410	TEST REQUIREMENTS	01410-1
01450	QUALITY CONTROL	01450-1
01455	LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC	01455-1
01510	TEMPORARY UTILITIES	01510-1
01590	FIELD OFFICES AND SHEDS	01590-1
01600	MATERIALS AND EQUIPMENT	01600-1
01700	CONTRACT CLOSEOUT	01700-1
01720	PROJECT RECORD DRAWINGS	01720-1
01740	WARRANTIES AND BONDS	01740-1

DIVISION 2 - SITE WORK

02110	SITE PREPARATION	02110-1
02200	EARTHWORK	02200-1
02210	SOIL EROSION AND SEDIMENT CONTROL	02210-1
02270	TEMPORARY SILT FENCE	02270-1

02400	CONSTRUCTION DEWATERING	02400-1
02433	STORM DRAINAGE PIPE	02433-1
02444	CHAIN LINK FENCE AND GATES	02444-1
02486	GRASSING AND MULCHING	02486-1
02513	ASPHALT CONCRETE PAVING	02513-1
02515	PROTECTION OF EXISTING SITE	02515-1
02600	WASTEWATER FLOW CONTROL	02600-1
02605	PRECAST CONCRETE MANHOLES AND STRUCTURES	02605-1
02606	SANITARY SEWER CONSTRUCTION	02606-1
02742	TESTING FOR ACCEPTANCE OF SANITARY SEWER	02742-1

Special Provisions-

In addition to the Bidding and Contract Documents, Division 1 General the Old Ball Sanitary Sewer, for the bidding and construction of the Etowah Trail Extension Project, the Contract shall comply with the Special Provisions that are provided below. The Special Provisions indicated below are meant to supplement the Old Ball Ground Sanitary Sewer Division 1 General Requirements and Division 2 Site Work Specifications. Prior to bidding, the Contractors shall bring to the attention of the Project Engineer, any and all conflicts that may impact their bid.

SUMMARY OF TRAIL WORK	104-000
TEMPORARY CONSTRUCTION FACILITIES	132-000
CLEANING	133-000
SITE CLEARING	03-1100
GRADING EARTH WORK	03-2000
CAST IN PLACE CONCRETE	03-3000
CONCRETE MIX SUBMITTAL FORM	03-0330
CONCRETE FORM WORK	03-1000
CONCRETE REINFORCEMENT	03-2000
ON-SITE DECORATIVE SIGNAGE	09-0000
BOARDWALK RAILING AND GATE SPECIFICATION	323116
VINE, SHRUB AND TREE PLANTING.	702-0000
PLANT TOPSOIL	708-0000
OUTDOOR FURNITURE	754-0000
MISCELLANEOUS CONSTRUCTION	999-9000

Conflicts within the Contract Documents -If conflicts exist between the Specifications, the governing descending order will be as follows:

1. DIVISION 0 - BIDDING AND CONTRACT REQUIREMENTS
2. DIVISION 1 - GENERAL REQUIREMENTS
3. PROJECT SPECIFIC SPECIAL PROVISION
4. PROJECT PLANS INCLUDING SPECIAL PLAN DETAILS
5. SPECIAL PROVISIONS
6. SUPPLEMENTAL SPECIFICATIONS
7. STANDARD PLANS INCLUDING STANDARD CONSTRUCTION DETAILS
8. STANDARD SPECIFICATIONS

ADVERTISEMENT FOR BIDDERS

Sealed Bids will be received by the City of Canton, 110 Academy Street, Canton, GA 30114, until:

10:00 am on Tuesday, August 18, 2020

for the Project known as:

Old Ball Ground Sanitary Sewer Phase 2 and the Etowah River Trail Extension

at which time and place the bids will be publicly opened and read aloud. Bids received after the designated time will not be considered and returned unopened.

The Project generally consists of the following major items:

1. Old Ball Ground Sewer
 - a. 8,220 lf. of 30" D.I.P. Sanitary Sewer Pipe
 - b. 100 lf of 42" Steel Casing Pipe
 - c. 35 Manholes
2. Etowah River Trail Extension
 - a. 6,700 lf of 10'-12' Wide Concrete Trail
 - b. 400 lf of Premanufactured Concrete Boardwalk

Bidders shall inform themselves concerning Georgia Laws and comply with same.

Bidding documents can be downloaded from the City's website at www.cantonga.gov or may be reviewed and obtained from ATKINS North America, 1600 Riveredge Parkway NW, Suite 700, Atlanta, Georgia, 30328, upon a non-refundable payment of \$350.00. If the documents are downloaded from the City's website, it is the responsibility of the individual or company that downloads the documents to continue to check the City's website for any addenda that may be issued. The City of Canton is not responsible for any information that any individual or company fails to get in an addendum that is posted on the website but is not downloaded.

A **mandatory pre-bid meeting** and site visit is scheduled for **Tuesday, August 11, 2020 at 10:00 am at Heritage Park located behind Mr. Clean Car Wash at 220 Riverstone Parkway, Canton, Georgia 30114**. The purpose of this meeting is to discuss the project and to answer any questions potential Contractors may have. No meetings or tours to review the Scope of Work for the project will be held individually or separately before or after this pre-bid meeting.

The time allowed for Substantial Completion is 510 days, and the time allowed for Final Completion and readiness for final payment is 540 days from the date of commencement.

Each Bid must be accompanied by a Bid Bond with good and sufficient surety or sureties approved by the OWNER for faithful acceptance of the contract, payable to, in favor of, and for the protection of the OWNER in an amount equivalent to five percent (5%) of the total amount payable by the terms of the contract or, in lieu thereof, a certified check, cashier's check, or cash in equal amount.

The successful bidder will be required to furnish the necessary additional Bond(s) as described in the Bidding Documents.

All Bids will remain subject to acceptance for 120 days after the day of the Bid opening, but OWNER may, in its sole discretion, release any Bid and return the Bid security prior to that date.

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

INSTRUCTIONS TO BIDDERS

Article 1 – Defined Terms

1.1 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:

A. *Bidder* - one who submits a Bid directly to Owner as distinct from a sub-bidder, who submits a bid to a Bidder.

B. *Issuing Office* – The office from which the Bidding Documents are to be issued and where the bidding procedures are to be administered.

C. *Successful Bidder* - the lowest, responsible and responsive Bidder to whom Owner (on the basis of Owner's evaluation as hereinafter provided) makes an award.

D. *Owner* - City of Canton, Georgia, party of the first part to the Contract Agreement, or its authorized and legal representatives.

E. *Contractor* - the party of the second part to the Contract Agreement or the authorized and legal representative of such party.

F. *Work and Project* - shall mean the entire complete construction required to be furnished under the Contract Documents.

G. *Products* - shall mean materials or equipment permanently incorporated into the Project.

H. *Provide* - shall mean to furnish and install.

Article 2 – Copies of Bidding Documents

2.1 Complete sets of the Bidding Documents in the number and for the

deposit sum, if any, stated in the advertisement or invitation to bid may be obtained from the Issuing Office. Bidding Documents are open for inspection to prospective bidders at the Issuing Office for the purpose of review in order to determine if the prospective bidders wish to obtain Bidding Documents.

2.2 Complete sets of Bidding Documents must be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents, whether obtained from the Owner, Engineer, Issuing Office, or other sources.

2.3 Owner and Engineer, in making copies of Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids for the Work and do not authorize or confer a license for any other use.

Article 3 – Qualifications of Bidders

3.1 Owner reserves the right to reject any Bidder who does not satisfy the Owner as to its ability to successfully perform the Work.

3.2 To demonstrate Bidder's qualifications to perform the Work, each Bidder must be prepared to submit within five (5) days after the bid opening upon request written evidence such as financial data, previous experience, present commitments, and such other data as may be requested.

3.3 The Bidder will be required to provide evidence of compliance with the requirements of O.C.G.A. 43-14 (Construction Industry Licensing Board

Acts and Rules and Regulations) with respect to the requirements of the code.

3.4 Failure of Bidder to provide such information, within ten (10) days of notification of request, shall be grounds for forfeiting of the bid security of that Bidder.

Article 4 – Examination of Bidding Documents, Other Related Data, and Site

4.1 Subsurface and Physical Conditions

A. The Supplementary Conditions identify:

1. Those reports known to Owner of explorations and tests of subsurface conditions at or contiguous to the Site.

2. Those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).

B. Copies of reports and drawings referenced in Paragraph 4.01.A will be made available by Owner to any Bidder on request. Those reports and drawings are not part of the Contract Documents, but the “technical data” contained therein upon which Bidder is entitled to rely as provided in Paragraph 4.02 of the General Conditions has been identified and established in Paragraph 4.02 of the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any “technical data” or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.

4.2 Underground Facilities

A. Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous to the Site is based upon information and data furnished to Owner and

Engineer by owners of such Underground Facilities, including Owner, or others.

4.3 Hazardous Environmental Condition

A. No reports or drawings related to Hazardous Environmental Conditions at the Site are known to Owner or Engineer.

4.4 Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions, and Underground Facilities, and possible changes in the Bidding Documents due to differing or unanticipated subsurface or physical conditions appear in Paragraphs 4.02, 4.03, and 4.04 of the General Conditions. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the Site, if any, and possible changes in the Contract Documents due to any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work, appear in Paragraph 4.06 of the General Conditions.

4.5 On request, Owner will provide Bidder access to the Site to conduct such examinations, investigations, explorations, tests, and studies as Bidder deems necessary for submission of a Bid. Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies. Bidder shall comply with all applicable Laws and Regulations relative to excavation and utility locates.

4.6 Reference is made to Article 7 of the Supplementary Conditions for the identification of the general nature of other work that is to be performed at the Site by Owner or others (such as utilities and other

prime contractors) that relates to the Work contemplated by these Bidding Documents. On request, Owner will provide to each Bidder for examination access to or copies of contract documents (other than portions thereof related to price) for such other work.

Paragraph 6.13.C of the General Conditions indicates that if an Owner safety program exists, it will be noted in the Supplementary Conditions.

4.7 It is the responsibility of each Bidder before submitting a Bid to:

A. Examine and carefully study the Bidding Documents, and the other related data identified in the Bidding Documents;

B. Visit the Site and become familiar with and satisfy Bidder as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;

C. Become familiar with and satisfy Bidder as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work;

D. Carefully study all: (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 the Site (except Underground Facilities) that have been identified in Paragraph 4.02 of the Supplementary Conditions as containing reliable "technical data," and (2) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in the Paragraph 4.06 of the Supplementary Conditions as containing reliable "technical data";

E. Consider 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 any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents; and (3) Bidder's safety precautions and programs;

F. Agree at the time of submitting its Bid that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price(s) bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents;

G. Become aware of the general nature of the work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents;

H. Promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder; and

I. Determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work.

4.8 The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 4, that without exception the Bid is premised upon performing and furnishing the Work required by the Bidding Documents and applying any specific means, methods, techniques, sequences, and procedures of

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

Article 5 – Site and Other Areas

5.1 The Site is identified in the Bidding Documents. Easements for permanent structures or permanent changes in existing facilities are to be obtained and paid for by Owner unless otherwise provided in the Bidding Documents. All additional lands and access thereto required for temporary construction facilities, construction equipment, or storage of materials and equipment to be incorporated in the Work are to be obtained and paid for by Contractor.

Article 6 – Interpretations and Addenda

6.1 All questions about the meaning or intent of the Bidding Documents are to be submitted to Engineer in writing. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda mailed or delivered to all parties recorded by Engineer as having received the Bidding Documents. Questions received less than ten (10) days prior to the date for opening of Bids ***may not be answered***. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

6.2 Addenda may be issued to clarify, correct, or change the Bidding Documents as deemed advisable by Owner or Engineer.

Article 7 – Bid Security

7.1 A Bid must be accompanied by Bid security made payable to Owner in an amount of FIVE percent (5%) of Bidder's maximum Bid price and in the form of a certified check, bank money order, or a Bid bond (on the form attached) issued by a surety meeting the requirements of Paragraphs 5.01 and 5.02 of the General Conditions.

7.2 The Bid security of the Successful Bidder will be retained until such Bidder has executed the Contract Documents, furnished the required contract security and met the other conditions of the Notice of Award, whereupon the Bid security will be returned. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited. Such forfeiture shall be Owner's exclusive remedy if Bidder defaults. The Bid security of other Bidders whom Owner believes to have a reasonable

chance of receiving the award may be retained by Owner until the earlier of seven days after the Effective Date of the Agreement or 61 days after the Bid opening, whereupon Bid security furnished by such Bidders will be returned.

7.3 Bid security of other Bidders whom Owner believes do not have a reasonable chance of receiving the award will be returned within seven days after the Bid opening.

Article 8 – Contract Times

8.1 The number of days within which, or the dates by which, Milestones are to be achieved and the Work is to be substantially completed and ready for final payment are set forth in the Agreement.

Article 9 – Liquidated Damages

9.1 Provisions for liquidated damages, if any, are set forth in the Agreement.

Article 10 – Substitute and “Or-Equal” Items

10.1 The Contract, if awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration of possible substitute or “or-equal” items. Whenever it is specified or described in the Bidding Documents that a substitute or “or-equal” item of material or equipment may be furnished or used by Contractor if acceptable to Engineer, application for such acceptance will not be considered by Engineer until after the Effective Date of the Agreement.

Article 11 – Subcontractors, Suppliers and Others

11.1 If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, individuals, or entities to be submitted to Owner in advance of a specified date prior to the Effective Date of the Agreement, the apparent

Successful Bidder, and any other Bidder so requested, shall within five days after Bid opening, submit to Owner a list of all such Subcontractors, Suppliers, individuals, or entities proposed for those portions of the Work for which such identification is required. Such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, individual, or entity if requested by Owner. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, individual, or entity, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit a substitute, in which case apparent Successful Bidder shall submit an acceptable substitute, Bidder’s Bid price will be increased (or decreased) by the difference in cost occasioned by such substitution, and Owner may consider such price adjustment in evaluating Bids and making the Contract award.

11.2 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors, Suppliers, individuals, or entities. Declining to make requested substitutions will not constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor, Supplier, individual, or entity so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to revocation of such acceptance after the Effective Date of the Agreement as provided in Paragraph 6.06 of the General Conditions.

11.3 Contractor shall not be required to employ any Subcontractor, Supplier, individual, or entity against whom Contractor has reasonable objection.

Article 12 – Preparation of Bid

12.1 The Bid Form is included with the Bidding Documents. Additional copies may be obtained from the issuing office.

12.2 All blanks on the Bid Form shall be completed in ink and the Bid Form signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form. A Bid price shall be indicated for each [section, Bid item, alternative, adjustment unit price item, and unit price item] listed therein. In the case of optional alternatives the words “No Bid,” “No Change,” or “Not Applicable” may be entered.

12.3 A Bid by a corporation shall be executed in the corporate name by the president or a vice-president or other corporate officer accompanied by evidence of authority to sign. The corporate seal shall be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown.

12.4 A Bid by a partnership shall be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership shall be shown.

12.5 A Bid by 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.

12.6 A Bid by an individual shall show the Bidder’s name and official address.

12.7 A Bid by a joint venture shall be executed by each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture shall be shown.

12.8 All names shall be printed in ink below the signatures.

12.9 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.

12.10 Postal and e-mail addresses and telephone number for communications regarding the Bid shall be shown.

12.11 The Bid shall contain evidence of Bidder’s authority and qualification to do business in the state where the Project is located, 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.

Article 13 – Basis of Bid; Comparison of Bids

13.1 *Unit Price*

A. Bidders shall submit a Bid on a unit price basis for each item of work set forth in the Bid Form.

B. The total of all estimated prices will be determined as the sum of the products of the estimated quantity of each item and the unit price bid for the item. 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 of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

D. The Bid price shall include such amounts as the Bidder deems proper for Contractor's overhead, costs, profit, and other expenses on account of cash allowances, if any, named in the Contract Documents, in accordance with Paragraph 11.02.B of the General Conditions.

13.2 Conditional bids will NOT be accepted.

Article 14 – Submittal of Bid

14.1 The Bidder is required to furnish the completed Bid Form and the completed Bid Bond Form bound in the Bidding Documents. Additional information required, as indicated, on the Bid Form shall also be submitted. The technical specifications may be omitted from the documents submitted with the Contractor's bid, but are considered part of the documents.

14.2 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 a plainly marked package with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted), the name and address of Bidder, the Bidders Georgia Utility Contractor's license number and shall be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED." Any bid which is not properly prepared and accompanied by proper certifications may be rejected by the Owner.

14.3 Any bid not bearing the bidder's utility contractor license number issued by the State of Georgia Construction Industry Licensing Board, when required by state law, may not be considered by the Owner.

Article 15 – Modification and Withdrawal of Bid

15.1 A Bid may be modified or withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where

Bids are to be submitted prior to the date and time for the opening of Bids.

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

Article 16 – Bids to Remain Subject to Acceptance

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

Article 17 – Evaluation of Bids and Award of Contract

17.1 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner further reserves the right to reject the Bid of any Bidder whom it finds, after reasonable inquiry and evaluation, to not be responsible. Owner may also reject the Bid of any Bidder if Owner believes that it would not be in the best interest of the Project to make an award to that Bidder. Owner also reserves the right to waive all informalities not involving price, time, or changes in the Work and to negotiate contract terms with the Successful Bidder.

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

the rejection of all Bids in which that Bidder has an interest.

17.3 In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices and other data, as may be requested in the Bid Form or prior to the Notice of Award.

17.4 In evaluating Bidders, Owner will consider the qualifications of Bidders and may consider the qualifications and experience of Subcontractors, Suppliers, and other individuals or entities proposed for those portions of the Work for which the identity of Subcontractors, Suppliers, and other individuals or entities must be submitted as provided in the Supplementary Conditions.

17.5 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders, proposed Subcontractors, Suppliers, individuals, or entities proposed for those portions of the Work in accordance with the Contract Documents.

17.6 If the Contract is to be awarded, Owner will award the Contract to the Bidder whose Bid is in the best interests of the Project.

Article 18 – Signing of Agreement

18.1 When Owner issues a Notice of Award to the Successful Bidder, it shall be accompanied by the required number of unsigned counterparts of the Agreement along with the other Contract Documents which are identified in the Agreement as attached thereto. Within 15 days thereafter, Successful Bidder shall sign and deliver the required number of counterparts of the Agreement and attached documents to Owner. Within ten days thereafter, Owner shall deliver one fully signed counterpart to

Successful Bidder with a complete set of the Drawings with appropriate identification.

Article 19 – Sales and Use Taxes

19.1 Contractor is responsible for all sales and use taxes, and shall include all costs attributable to sales and use taxes in the Bid.

Article 20 – Retainage

20.1 Provisions concerning Contractor's rights to deposit securities in lieu of retainage are set forth in the Agreement.

Article 21 – Security and Immigration Act

21.1 Contractors and Subcontractors who enter into contracts with public employers are required to register and participate in the Federal Work Authorization Program to verify work eligibility information of new employees. Bidders are required to fill out the following forms located in the Bidding Documents attesting to their status under this program and that they will pass on the same requirements to their Subcontractors as required by OCGA 13-10-90 and 13-10-91; GA Department of Labor 300-10-1:

- A. Affidavit Verifying Status
- B. Security and Immigration Compliance Act Certification

21.2 Pursuant to Code of Georgia 13-10-90 et. seq., the Georgia Security and Immigration Compliance Act of 2006, the following forms located in the Bidding Documents shall be completed prior to Award:

- A. Contractor Affidavit and Agreement
- B. Subcontractor Affidavit and Agreement

21.3 Contractor understands and agrees that compliance with the requirements of OCGA 13-10-90, OCGA 13-10-91, and Georgia Department of Labor Rule 300-10-1 are conditions of this Agreement.

21.4 Contractor further agrees that such compliance shall be attested by Contractor and its Subcontractors by execution of the appropriate Contractor Affidavit and Agreement and Subcontractor Affidavit forms included in the Contract Documents.

END OF SECTION

BID FORM

PROJECT IDENTIFICATION

City of Canton
Old Ball Ground Sanitary Sewer Phase 2
and the Etowah River Trail Extension

THIS BID IS SUBMITTED TO:

City of Canton
110 Academy St.
Canton, GA 30114

1. The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.
2. Bidder accepts all of the terms and conditions of the Advertisement and Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for one hundred and twenty days (120) after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.
3. 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 (List Addenda by Addendum Number and Date):

<u>Addendum No.</u>	<u>Date Received</u>	<u>Addendum No.</u>	<u>Date Received</u>
---------------------	----------------------	---------------------	----------------------

- B. Bidder has visited the site and become familiar with and is satisfied as to the general, local, and site conditions that may affect cost, progress, and performance of the Work.
- C. Bidder is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, and performance of the Work.

- D. Bidder acknowledges that Owner and Engineer do not assume responsibility for the accuracy or completeness of information and data shown or indicated in the Bidding Documents with respect to Underground Facilities at or contiguous to the site. Bidder has carefully studied all: (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 the site (except Underground Facilities) that have been identified in SC-4.02 as containing reliable "technical data," and (2) reports and drawings of Hazardous Environmental Conditions, if any, at the site that have been identified in SC-4.06 as containing reliable "technical data."
 - 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 3.01.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 Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by Engineer is acceptable to Bidder.
 - 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.
4. 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 acknowledges that the quantities are not guaranteed and are solely for the purpose of comparison of Bids, final payment for all unit price bid items will be based on actual quantities provided.
 - C. Bidder declares that he understands that the quantities shown on the proposal are subject to adjustment by either increase or decrease, and that should the quantities of any of the items

of work be increased, the undersigned proposes to do the additional work at the unit process stated herein; and should the quantities be decreased, he also understands that payment will be made on actual quantities at the price bid and will make no claim for anticipated profits for any decrease in the quantities and that actual quantities will be determined upon completion of work, at which time adjustment will be made to the contract amount by direct increase or decrease.

- D. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;
 - E. Bidder has not solicited or induced any individual or entity to refrain from bidding; and
 - F. 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:
 - i. “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;
 - ii. “fraudulent practice” means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
 - iii. “collusive practice” means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and
 - iv. “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.
5. Bidder will complete the Work in accordance with the Contract Documents for the prices listed in the following Bid Schedule:

The remainder of this page is intentionally left blank

BID PROPOSAL
CITY OF CANTON
OLD BALLGROUND SANITARY SEWER REPLACEMENT PROJECT
BID FOR UNIT PRICE WORK

All bid items shall include all costs for furnishing all labor, materials, equipment, supplies, allowances and all other costs including permit fees, taxes, insurance, miscellaneous costs, overhead and profit incurred for the work, complete in place. Payment shall be in accordance with the General Conditions. Any unused balance of the unit price items shall revert to the Owner upon completion of the project.

Item	Description	Quantity	Units	Unit Price (in figures)	Total Price (in figures)
1					
2		See Bid Proposal Sheets 00410-4.1 4.24			
3					
4					
5					

TOTAL BID AMOUNT _____

TOTAL BID AMOUNT IN WORDS _____

The total amount bid shall be shown in both words and numerals. In case of a discrepancy, the amount shown in words shall govern. In the event of a discrepancy between the unit price bid and the extension, the unit price will be deemed intended by the Bidder and the extensions adjusted. In the event of a discrepancy between the sum of the extended amounts and the bid total, the sum of the extended amounts shall govern.

The remainder of this page is intentionally left blank

CITY OF CANTON, GEORGIA
 OLD BALLGROUND
 SANITARY SEWER PHASE 2 ETOWAH RIVER TRAIL EXTENSION
 ATKINS PROJECT NO. 100065927

BID PROPOSAL

<u>ITEM NO.</u>	<u>DESCRIPTION</u>	<u>EST. QTY.</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>TOTAL AMOUNT</u>
 <u>SANITARY SEWER</u>					
1.	42" Steel Casing (0.500" W.T.)(Open Cut)	100	L.F.	\$ _____ Numerals	\$ _____ Numerals
				Unit Price in Words	
2.	30" D.I.P. in Casing	100	L.F.	\$ _____ Numerals	\$ _____ Numerals
				Unit Price in Words	
3.	30" D.I.P. 0 - 6' Depth Sewer	43	L.F.	\$ _____ Numerals	\$ _____ Numerals
				Unit Price in Words	
4.	30" D.I.P. 6' - 8' Depth Sewer	220	L.F.	\$ _____ Numerals	\$ _____ Numerals
				Unit Price in Words	
5.	30" D.I.P. 8' - 10' Depth Sewer	431	L.F.	\$ _____ Numerals	\$ _____ Numerals
				Unit Price in Words	
6.	30" D.I.P. 10' - 12' Depth Sewer	1,434	L.F.	\$ _____ Numerals	\$ _____ Numerals
				Unit Price in Words	
7.	30" D.I.P. 12' - 14' Depth Sewer	744	L.F.	\$ _____ Numerals	\$ _____ Numerals
				Unit Price in Words	

CITY OF CANTON, GEORGIA
 OLD BALLGROUND
 SANITARY SEWER PHASE 2 ETOWAH RIVER TRAIL EXTENSION
 ATKINS PROJECT NO. 100065927

BID PROPOSAL

ITEM NO. <u>DESCRIPTION</u>	EST. QTY.	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>TOTAL AMOUNT</u>
8. 30" D.I.P. 14' - 16' Depth Sewer	1,185	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
9. 30" D.I.P. 16' - 18' Depth Sewer	665	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
10. 30" D.I.P. 18' - 20' Depth Sewer	667	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
11. 30" D.I.P. 20' - 22' Depth Sewer	500	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
12. 30" D.I.P. 22' - 24' Depth Sewer	355	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
13. 30" D.I.P. 24' - 26' Depth Sewer	462	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
14. 30" D.I.P. 26' - 28' Depth Sewer	715	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	

CITY OF CANTON, GEORGIA
 OLD BALLGROUND
 SANITARY SEWER PHASE 2 ETOWAH RIVER TRAIL EXTENSION
 ATKINS PROJECT NO. 100065927

BID PROPOSAL

ITEM NO. <u>DESCRIPTION</u>	EST. QTY.	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>TOTAL AMOUNT</u>
15. 30" D.I.P. 28' - 30' Depth Sewer	213	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
16. 30" D.I.P. 30' - 32' Depth Sewer	175	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
17. 30" D.I.P. 32' - 34' Depth Sewer	169	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
18. 30" D.I.P. 34' - 36' Depth Sewer	111	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
19. 30" D.I.P. 36' - 38' Depth Sewer	23	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
20. 8" D.I.P. 12' - 14' Depth Sewer	40	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
21. 6" PVC Service	120	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	

CITY OF CANTON, GEORGIA
 OLD BALLGROUND
 SANITARY SEWER PHASE 2 ETOWAH RIVER TRAIL EXTENSION
 ATKINS PROJECT NO. 100065927

BID PROPOSAL

ITEM NO. <u>DESCRIPTION</u>	EST. QTY.	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>TOTAL AMOUNT</u>
22. Standard Manhole 0 - 6' Depth	32	EA	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
23. Extra Depth Manhole 6' - 12' Depth	186	V.F	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
24. Extra Depth Manhole 12'+ Depth	220	V.F	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
25. Drop Manhole 0 - 6' Depth	4	EA	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
26. Extra Depth Drop Manhole 6' - 12' Depth	24	V.F	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
27. Extra Depth Drop Manhole 12'+ Depth	60	V.F	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
28. Connect to Existing Wet Well	1	EA	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	

CITY OF CANTON, GEORGIA
 OLD BALLGROUND
 SANITARY SEWER PHASE 2 ETOWAH RIVER TRAIL EXTENSION
 ATKINS PROJECT NO. 100065927

BID PROPOSAL

<u>ITEM NO.</u>	<u>DESCRIPTION</u>	<u>EST. QTY.</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>TOTAL AMOUNT</u>
29.	Connect to Existing 24" Sewer	1	EA	\$ _____ Numerals	\$ _____ Numerals
_____ Unit Price in Words					
30.	Connect to Existing 10" Sewer	1	EA	\$ _____ Numerals	\$ _____ Numerals
_____ Unit Price in Words					
31.	Connect to Existing 8" Sewer	2	EA.	\$ _____ Numerals	\$ _____ Numerals
_____ Unit Price in Words					
32.	Connect to Existing 6" Service	5	EA	\$ _____ Numerals	\$ _____ Numerals
_____ Unit Price in Words					
33.	Connect to Existing Manhole	1	EA	\$ _____ Numerals	\$ _____ Numerals
_____ Unit Price in Words					
34.	30" x 6" Wye	3	EA.	\$ _____ Numerals	\$ _____ Numerals
_____ Unit Price in Words					
35.	6" 1/8 Bend	5	EA	\$ _____ Numerals	\$ _____ Numerals
_____ Unit Price in Words					

CITY OF CANTON, GEORGIA
 OLD BALLGROUND
 SANITARY SEWER PHASE 2 ETOWAH RIVER TRAIL EXTENSION
 ATKINS PROJECT NO. 100065927

BID PROPOSAL

<u>ITEM NO.</u> <u>DESCRIPTION</u>	<u>EST. QTY.</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>TOTAL AMOUNT</u>
36. 6" Clean-Out	5	EA	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
37. Concrete Ditch Cap	320	S.Y	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
38. Cut & Plug Existing 30" Sewer	1	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
39. Cut & Plug Existing 10" Sewer	1	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
40. Cut & Plug Existing 8" Sewer	2	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
41. Cut & Plug Existing 6" Service	3	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
42. Remove and Replace 30" CMP	120	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	

CITY OF CANTON, GEORGIA
 OLD BALLGROUND
 SANITARY SEWER PHASE 2 ETOWAH RIVER TRAIL EXTENSION
 ATKINS PROJECT NO. 100065927

BID PROPOSAL

ITEM NO. DESCRIPTION	EST. QTY.	UNIT	UNIT PRICE	TOTAL AMOUNT
43. Remove and Replace 24" CMP	80	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
44. Remove and Replace 18" CMP	200	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
45. Remove and Replace 10" DIP Force Main Class 50 with Protecto 401	160	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
46. Remove and Replace 12" DIP Water Main Class 50 with Polywrap	200	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
47. Remove and Replace 8" DIP Water Main Class 50 with Polywrap	160	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
48. Remove and Replace 4" Water Main	80	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
49. Remove and Replace 1-1/2" Type F Asphalt	5,600	S.Y.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	

CITY OF CANTON, GEORGIA
 OLD BALLGROUND
 SANITARY SEWER PHASE 2 ETOWAH RIVER TRAIL EXTENSION
 ATKINS PROJECT NO. 100065927

BID PROPOSAL

ITEM NO. DESCRIPTION	EST. QTY.	UNIT	\$	<u>UNIT PRICE</u>	\$	<u>TOTAL AMOUNT</u>
50. Remove and Replace Gravel Drive	2,400	S.Y.	\$	Numerals	\$	Numerals
				Unit Price in Words		
51. Remove and Replace Concrete Curb & Gutter	1,240	L.F.	\$	Numerals	\$	Numerals
				Unit Price in Words		
52. Remove and Replace Conc. Steps	1	EA.	\$	Numerals	\$	Numerals
				Unit Price in Words		
53. Remove and Replace Conc. Headwall	6	EA.	\$	Numerals	\$	Numerals
				Unit Price in Words		
54. Remove and Replace Exist. Conc. Trail	600	L.F.	\$	Numerals	\$	Numerals
				Unit Price in Words		
55. Remove and Replace 8' (h) Chain Link Fence	120	L.F.	\$	Numerals	\$	Numerals
				Unit Price in Words		
56. Remove and Replace 6' (h) Chain Link Fence	640	L.F.	\$	Numerals	\$	Numerals
				Unit Price in Words		

CITY OF CANTON, GEORGIA
 OLD BALLGROUND
 SANITARY SEWER PHASE 2 ETOWAH RIVER TRAIL EXTENSION
 ATKINS PROJECT NO. 100065927

BID PROPOSAL

ITEM NO. DESCRIPTION	EST. QTY.	UNIT	UNIT PRICE	TOTAL AMOUNT
57. Remove and Replace 4' (h) Chain Link Fence	220	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
58. Remove and Replace 3' (h) Wood Fence	200	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
59. Remove and Replace Gate	2	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
60. Remove and Replace Brick Wall	80	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
61. Remove and Replace Georgia Power Monument	4	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
62. Remove and Replace Power Pole	1	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
63. Remove and Replace Light Pole	3	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	

CITY OF CANTON, GEORGIA
 OLD BALLGROUND
 SANITARY SEWER PHASE 2 ETOWAH RIVER TRAIL EXTENSION
 ATKINS PROJECT NO. 100065927

BID PROPOSAL

ITEM NO. <u>DESCRIPTION</u>	EST. QTY.	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>TOTAL AMOUNT</u>
64. Remove and Replace Drop Inlet	2	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
65. Remove and Replace Iron Pin	8	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
66. Remove and Replace Elm Tree	4	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
67. Remove and Replace Cherry Tree	4	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
68. Remove and Replace Rip-Rap Dam	1	L.S.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
69. Remove and Replace Detention Pond	2	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
70. Subgrade Stabilizer	3,118	TON	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	

CITY OF CANTON, GEORGIA
 OLD BALLGROUND
 SANITARY SEWER PHASE 2 ETOWAH RIVER TRAIL EXTENSION
 ATKINS PROJECT NO. 100065927

BID PROPOSAL

<u>ITEM NO.</u> <u>DESCRIPTION</u>	<u>EST. QTY.</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>TOTAL AMOUNT</u>
71. Solid Rock Excavation	3,277	TON	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
72. ByPass Pumping	1	L.S.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
73. Miscellaneous Ductile Iron Fittings	2,000	LBS	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
74. Miscellaneous Concrete Blocking	12	C.Y.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
75. Landscaping	1	L.S	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
76. Sod - Bermuda	11,900	S.Y.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
77. Miscellaneous Concrete	20	C.Y.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	

CITY OF CANTON, GEORGIA
 OLD BALLGROUND
 SANITARY SEWER PHASE 2 ETOWAH RIVER TRAIL EXTENSION
 ATKINS PROJECT NO. 100065927

BID PROPOSAL

ITEM NO. DESCRIPTION	EST. QTY.	UNIT	UNIT PRICE	TOTAL AMOUNT
78. Reconnect Existing Water Meter	4	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
79. 12" Retainer Gland	4	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
80. 10" Retainer Gland	4	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
81. 8" Retainer Gland	4	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
82. Connect to Existing Water Main	8	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
83. 30" Restrained Joint Gasket	6	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
84. Mobilization and Demobilization	1	L.S.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	

CITY OF CANTON, GEORGIA
 OLD BALLGROUND
 SANITARY SEWER PHASE 2 ETOWAH RIVER TRAIL EXTENSION
 ATKINS PROJECT NO. 100065927

BID PROPOSAL

ITEM NO. DESCRIPTION	EST. QTY.	UNIT	UNIT PRICE	TOTAL AMOUNT
85. Owners Allowance	1	L.S.	\$ <u>250,000.00</u>	\$ <u>250,000.00</u>
			Numerals	Numerals
			<u>Two Hundred Fifty Thousand & 00/100</u> Unit Price in Words	

SUBTOTAL SANITARY SEWER

Subtotal Sanitary Sewer in Numerals

Subtotal Sanitary Sewer in Words

TRAIL EXTENSION

86. Traffic Control - Project 100062569	1	L.S.	\$ _____	\$ _____
			Numerals	Numerals
			<u>Unit Price in Words</u>	
87. Mobilization and Demobilization	1	L.S.	\$ _____	\$ _____
			Numerals	Numerals
			<u>Unit Price in Words</u>	
88. Clearing and Grubbing - Project 100062569	1	L.S.	\$ _____	\$ _____
			Numerals	Numerals
			<u>Unit Price in Words</u>	
89. Grading Complete - Project 100062569	1	L.S.	\$ _____	\$ _____
			Numerals	Numerals
			<u>Unit Price in Words</u>	
90. Found Bkfill Matl, TP II (As Directed By Engineer)	500	C.Y.	\$ _____	\$ _____
			Numerals	Numerals
			<u>Unit Price in Words</u>	
91. Conc Sidewalk, 8 inch, ADA Ramp Including Material and Detectable Warning Strip	8	S.Y.	\$ _____	\$ _____
			Numerals	Numerals
			<u>Unit Price in Words</u>	

CITY OF CANTON, GEORGIA
 OLD BALLGROUND
 SANITARY SEWER PHASE 2 ETOWAH RIVER TRAIL EXTENSION
 ATKINS PROJECT NO. 100065927

BID PROPOSAL

ITEM NO. DESCRIPTION	EST. QTY.	UNIT	UNIT PRICE	TOTAL AMOUNT
92. Graded Aggregate Base Crs, 6 inch, Including Material (Sidewalk / Trail Base) (Sidewalk/Trail Base)	11,675	S.Y.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
93. Aggregate Surface Course, 6 inch Including Material	4,025	S.Y.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
94. Reinf Conc Approach Slab Including Material (At Beginning and End of Boardwalks	150	S.Y.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
95. Concrete Sidewalk / Trail, 6 inch (with WWF 6x6 - 10 Gauge) Include Detectable Warning Surface)	8,450	S.Y.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
96. Plain Concrete Ditch Paving, 4 inch	125	S.Y.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
97. Concrete Curb & Gutter, 6 inch x 30 inch, TP 2	38	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
98. Sawed Joints in Existing Pavements - PCC	12	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	

CITY OF CANTON, GEORGIA
 OLD BALLGROUND
 SANITARY SEWER PHASE 2 ETOWAH RIVER TRAIL EXTENSION
 ATKINS PROJECT NO. 100065927

BID PROPOSAL

ITEM NO. DESCRIPTION	EST. QTY.	UNIT	UNIT PRICE	TOTAL AMOUNT
99. Geogrid	8,450	S.Y.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
100. Mortar Rubble Masonry, Wall No. 1	85	C.Y.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
101. Mortar Rubble Masonry, Wall No. 2	35	C.Y.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
102. Class A Concrete, Type P3, Retaining Wall Wall No. 3	95	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
103. Concrete Headwalls	60	C.Y.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
104. Storm Drain Pipe, 12 inch, H 1-10	125	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
105. Storm Drain Pipe, 15 inch, H 1-10	28	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	

CITY OF CANTON, GEORGIA
 OLD BALLGROUND
 SANITARY SEWER PHASE 2 ETOWAH RIVER TRAIL EXTENSION
 ATKINS PROJECT NO. 100065927

BID PROPOSAL

ITEM NO. DESCRIPTION	EST. QTY.	UNIT	UNIT PRICE	TOTAL AMOUNT
106. Storm Drain Pipe, 18 inch, H 1-10	85	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
107. Storm Drain Pipe, 24 inch, H 1-10	160	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
108. Flared End Section, 15 inch	1	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
109. Slope Drain Pipe, 15 inch	25	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
110. Stone Dumped Rip Rap, TP 3, 24 inch	1,500	S.Y.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
111. Plastic Filter Fabric	1,500	S.Y.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
112. Drop Inlet, GP 1	8	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	

CITY OF CANTON, GEORGIA
 OLD BALLGROUND
 SANITARY SEWER PHASE 2 ETOWAH RIVER TRAIL EXTENSION
 ATKINS PROJECT NO. 100065927

BID PROPOSAL

<u>ITEM NO.</u> <u>DESCRIPTION</u>	<u>EST. QTY.</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>TOTAL AMOUNT</u>
113. Storm Sewer Manhole, TP 1	4	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
114. Solid Traffic Stripe, 12 inch, White (Crosswalk)	75	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
115. Solid Traffic Stripe, 24 inch, White	12	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
116. Permanent Grassing - Hydroseed Bermuda Grass	0.5	AC.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
117. Permanent Grassing - Hydroseed Native Grass Roadside Seed Mix	4	AC.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
118. Permanent Grassing - Hydroseed Native Grass Roadside Slope Seed Mix	5	AC.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
119. Permanent Grassing - Hydroseed Annual/Perennial Wildflower Seed Mix	6	AC.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	

CITY OF CANTON, GEORGIA
 OLD BALLGROUND
 SANITARY SEWER PHASE 2 ETOWAH RIVER TRAIL EXTENSION
 ATKINS PROJECT NO. 100065927

BID PROPOSAL

ITEM NO. DESCRIPTION	EST. QTY.	UNIT	UNIT PRICE	TOTAL AMOUNT
120. Permanent Grassing - Hydroseed Riparian Seed Mix	1	AC.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
121. Agricultural Lime	20	TON	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
122. Fertilizer Mixed Grade	15	TON	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
123. Fertilizer Nitrogen Content	1,000	LB	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
124. Azalea X 'George L. Taber' - 3 Gal.	24	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
125. Buddleja Davidii 'Black Knight' - 3 Gal.	3	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
126. Miscanthus Sinensis 'Adagio' - 3 Gal.	19	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	

CITY OF CANTON, GEORGIA
 OLD BALLGROUND
 SANITARY SEWER PHASE 2 ETOWAH RIVER TRAIL EXTENSION
 ATKINS PROJECT NO. 100065927

BID PROPOSAL

ITEM NO. DESCRIPTION	EST. QTY.	UNIT	UNIT PRICE	TOTAL AMOUNT
127. Rudbeckia Fulgida 'Goldsturm' - 1 Gal.	90	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
128. Lagerstroemia Indica 'Sioux' - 8'-10' HT.	6	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
129. Quercus Phellos 'Hightower' 3" Cal.	3	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
130. Pinus Taeda - Bare Root Seedling (Reforested Tree Mix)	300	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
131. Quercus Alba - Bare Root Seedling (Reforested Tree Mix)	300	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
132. Quercus Nigra - Bare Root Seedling (Reforested Tree Mix)	300	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
133. Quercus Rubra - Bare Root Seedling (Reforested Tree Mix)	300	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	

CITY OF CANTON, GEORGIA
 OLD BALLGROUND
 SANITARY SEWER PHASE 2 ETOWAH RIVER TRAIL EXTENSION
 ATKINS PROJECT NO. 100065927

BID PROPOSAL

ITEM NO. DESCRIPTION	EST. QTY.	UNIT	UNIT PRICE	TOTAL AMOUNT
134. Liriodendron Tulipifera - Bare Root Seedling (Reforested Tree Mix)	300	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
135. Landscape Mulch	200	S.Y.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
136. Plant Topsoil	25	C.Y.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
137. Reset Stop / Street Sign (Incl. All Material and Installation)	1	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
138. Bench, 8 FT. (include concrete footing)	1	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
139. Waste Receptacle Unit (include concrete footing)	1	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
140. Bicycle Rack (include concrete footing)	2	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	

CITY OF CANTON, GEORGIA
 OLD BALLGROUND
 SANITARY SEWER PHASE 2 ETOWAH RIVER TRAIL EXTENSION
 ATKINS PROJECT NO. 100065927

BID PROPOSAL

<u>ITEM NO.</u> <u>DESCRIPTION</u>	<u>EST. QTY.</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>TOTAL AMOUNT</u>
141. Bicycle Repair Station (include concrete footing)	1	EA.	\$ _____ Numerals	\$ _____ Numerals
_____ Unit Price in Words				
142. Retractable Bollard	30	EA.	\$ _____ Numerals	\$ _____ Numerals
_____ Unit Price in Words				
143. Guardrail, TP W (Incl. All Material and Installation)	88	L.F.	\$ _____ Numerals	\$ _____ Numerals
_____ Unit Price in Words				
144. Guardrail Terminal, TP 12A, 31 Inch, Tangent, Energy Absorbing	1	EA.	\$ _____ Numerals	\$ _____ Numerals
_____ Unit Price in Words				
145. Orange Safety Fence	4,650	L.F.	\$ _____ Numerals	\$ _____ Numerals
_____ Unit Price in Words				
146. Fence Special Design - 48 inch Ht. Wood Railing Fence	1,400	L.F.	\$ _____ Numerals	\$ _____ Numerals
_____ Unit Price in Words				
147. Informational Kiosk	3	EA.	\$ _____ Numerals	\$ _____ Numerals
_____ Unit Price in Words				

CITY OF CANTON, GEORGIA
 OLD BALLGROUND
 SANITARY SEWER PHASE 2 ETOWAH RIVER TRAIL EXTENSION
 ATKINS PROJECT NO. 100065927

BID PROPOSAL

ITEM NO. DESCRIPTION	EST. QTY.	UNIT	UNIT PRICE	TOTAL AMOUNT
148. Material Testing	1	LS	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
149. Steel Casing - 30 inch	45	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
150. Boardwalk Installation Only (Manufactured by Perma Track)	400	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
151. Pre-Negotiated Boardwalk Material Cost (Manufactured by Perma Track)	1	EST	\$ 450,000.00 Numerals	\$ 450,000.00 Numerals
			Unit Price in Words	
152. Boardwalk Railing	1,010	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
153. Boardwalk Foundations (Include Material and Installation)	1	L.S.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
154. H-Pile Points, HP 14 X 89	56	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	

CITY OF CANTON, GEORGIA
 OLD BALLGROUND
 SANITARY SEWER PHASE 2 ETOWAH RIVER TRAIL EXTENSION
 ATKINS PROJECT NO. 100065927

BID PROPOSAL

ITEM NO. DESCRIPTION	EST. QTY.	UNIT	UNIT PRICE	TOTAL AMOUNT
155. Piling in Place, Steel H, HP 14 X 89	1,400	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
156. Load Test, Steel H, 14 X 89 (If Reqd')	1	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
157. Dynamic Pile Test	5	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
158. Pile Encasement, 14 inch Pile	280	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
159. Geotechnical Report Boardwalk Foundation Investigation (BFI) Includes all Boardwalks Foundations (BFI) (5) and Boring locations at each Bent Location, Beginning and End of the Boardwalk (Total of 10)	1	L.S.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
160. Geotechnical Report Wall Foundation Investigation (WFI)	1	L.S.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
161. Owners Allowance	1	L.S.	\$ 150,000.00 Numerals	\$ 150,000.00 Numerals
			One Hundred Fifty Thousand & 00/100 Unit Price in Words	

CITY OF CANTON, GEORGIA
 OLD BALLGROUND
 SANITARY SEWER PHASE 2 ETOWAH RIVER TRAIL EXTENSION
 ATKINS PROJECT NO. 100065927

BID PROPOSAL

ITEM NO. DESCRIPTION	EST. QTY.	UNIT	UNIT PRICE	TOTAL AMOUNT
SUBTOTAL TRAIL EXTENSION				
			Subtotal Trail Extension in Numerals	
			Subtotal Trail Extension in Words	
BID ALTERNATE #1 DEDUCT				
The Contractor shall provide Bid Alternate #1 Deduct, which includes in lieu of the Contractor providing the labor and				
162. Boardwalk Installation Only (Manufactured by Perma Track)	225	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
163. Pre-Negotiated Boardwalk Material Cost (Manufactured by Perma Track)	1	EST	\$ 253,125.00 Numerals	\$ 253,125.00 Numerals Two Hundred Fifty-Three Thousand One Hundred Twenty-Five & 00/100
			Unit Price in Words	
164. Reinf Conc Approach Slab Including Material (At Beginning and End of Boardwalks)	90	S.Y.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
165. Boardwalk Railing	525	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
166. H-Pile Points, HP 14 X 89	32	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
167. Piling in Place, Steel H, HP 14 X 89	800	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
168. Dynamic Pile Test	3	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	

CITY OF CANTON, GEORGIA
 OLD BALLGROUND
 SANITARY SEWER PHASE 2 ETOWAH RIVER TRAIL EXTENSION
 ATKINS PROJECT NO. 100065927

BID PROPOSAL

ITEM NO. DESCRIPTION	EST. QTY.	UNIT	UNIT PRICE	TOTAL AMOUNT
169. Pile Encasement, 14 inch Pile	160	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	

The Contractor shall provide the labor and materials to install the following improvements at the three boardwalk

170. Grading Complete (For Trail on grade at each boardwalk No. 1, 2, & 3 location)	1	L.S.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	

171. Storm Drain Pipe, 60 inch RCP, H 1-10	40	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	

172. Concrete Headwalls	72	C.Y.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	

173. Fence Special Design - 48 inch Ht. Wood Railing Fence	750	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	

SUBTOTAL BID ALTERNATE NO. 1 DEDUCT

Subtotal Trail Extension in Numerals
Subtotal Trail Extension in Words

EROSION CONTROL ITEMS

174. Temporary Construction Exit and Maintenance	9	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	

175. Double Row Type "C" Silt Fence and Maintenance	17,350	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	

CITY OF CANTON, GEORGIA
 OLD BALLGROUND
 SANITARY SEWER PHASE 2 ETOWAH RIVER TRAIL EXTENSION
 ATKINS PROJECT NO. 100065927

BID PROPOSAL

ITEM NO. DESCRIPTION	EST. QTY.	UNIT	UNIT PRICE	TOTAL AMOUNT
176. Storm Drain Outlet Protection	16	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
177. Inlet Sediment Trap and Maintenance	18	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
178. Stream Bank Stabilization	10	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
179. Tree Protection Fencing	4,000	L.F.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
180. Erosion Control Matting (Bonded Fiber Matrix Slope Matting)	24,600	S.Y.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
181. Water Quality Monitoring and Sampling	9	EA.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	
182. Water Quality Inspections	18	MO.	\$ _____ Numerals	\$ _____ Numerals
			Unit Price in Words	

CITY OF CANTON, GEORGIA
 OLD BALLGROUND
 SANITARY SEWER PHASE 2 ETOWAH RIVER TRAIL EXTENSION
 ATKINS PROJECT NO. 100065927

BID PROPOSAL

ITEM NO. DESCRIPTION	EST. QTY.	UNIT	\$	<u>UNIT PRICE</u>	\$	<u>TOTAL AMOUNT</u>
183. Mulching	27,400	S.Y.	\$	Numerals	\$	Numerals
				Unit Price in Words		
184. Temporary Grassing	27,400	S.Y.	\$	Numerals	\$	Numerals
				Unit Price in Words		
185. Permanent Grassing	27,400	S.Y.	\$	Numerals	\$	Numerals
				Unit Price in Words		
186. Sod	10,000	S.Y.	\$	Numerals	\$	Numerals
				Unit Price in Words		
187. Dust Control	1	L.S.	\$	Numerals	\$	Numerals
				Unit Price in Words		
SUBTOTAL EROSION CONTROL						Subtotal Erosion Control in Numerals
						Subtotal Erosion Control in Words

CITY OF CANTON, GEORGIA
 OLD BALLGROUND
 SANITARY SEWER PHASE 2 ETOWAH RIVER TRAIL EXTENSION
 ATKINS PROJECT NO. 100065927

BID PROPOSAL

ITEM NO.	<u>DESCRIPTION</u>	EST. QTY.	UNIT	UNIT PRICE	TOTAL AMOUNT
-------------	--------------------	--------------	------	------------	--------------

SUMMARY

SUBTOTAL SANITARY SEWER

Subtotal Sanitary Sewer in Numerals

SUBTOTAL TRAIL EXTENSION

Subtotal Trail Extension in Numerals

**SUBTOTAL TRAIL EXTENSION
 BID ALTERNATE NO. 1 DEDUCT**

Subtotal Trail Extension in Numerals

SUBTOTAL EROSION CONTROL

Subtotal Erosion Control in Numerals

GRAND TOTAL

Grand Total in Numerals

GRAND TOTAL

\$ _____
Grand Total in Words

6. Bidder agrees that the Work will be substantially complete within 510 calendar days after the date when the Contract Times commence to run as provided in Paragraph 2.03 of the General Conditions, and will be completed and ready for final payment in accordance with Paragraph 14.07 of the General Conditions within 540 calendar days after the date when the Contract Times commence to run

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

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

A. Required Bid security in the form of a Bid Bond, Certified Check, Cashiers Check, or Cash
(strikeout inapplicable terms)

B. Bidders who submit Bid Security in the form of a Certified Check, Cashiers Check, or Cash are bound to the "Terms of Bid Bond" as if submitted on the attached Bid Bond form.

8. Communications concerning this Bid shall be addressed to :

The address of the Bidder indicated below:

BIDDERS NAME:

Primary Contact Person:

Secondary Contact Person:

Bidders Street Address:

Bidders Mailing Address:

(if different)

Bidders Phone No.:

Bidders Fax No.:

Bidders e-mail:

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

THIS BID SUBMITTED on _____

If BIDDER is:

An Individual

Name (typed or printed): _____

By: _____

(Individual's signature)

Doing business as: _____

Business Address: _____

Phone No.: _____

FAX No.: _____

e-mail address: _____

A Partnership

Partnership Name: _____

(Firm Name)

By: _____

(Signature of general partner -- attach evidence of authority to sign)

Name (typed or printed): _____

Business Address: _____

Phone No.: _____

FAX No.: _____

e-mail address: _____

A Corporation

Corporation Name: _____

(SEAL)

State of Incorporation: _____

Type (General Business, Professional, Service, Limited Liability): _____

By: _____

(Signature -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

(CORPORATE SEAL)

Attest _____

(Signature)

Business Address: _____

Phone No.: _____

FAX No.: _____

e-mail address: _____

Date of Qualification to do business in State of Georgia is: _____

Georgia Utility Contractor License No.: _____

Expiration Date: _____

A Joint Venture

Name of Joint Venture: _____

First Joint Venturer Name: _____(SEAL)

By: _____

(Signature of first joint venture partner -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Second Joint Venturer Name: _____(SEAL)

By: _____

(Signature of second joint venture partner -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Business Address: _____

Phone No.: _____

FAX No.: _____

e-mail address: _____

(Each joint venturer must sign. The manner of signing for each individual, partnership, and corporation that is a party to the joint venture should be in the manner indicated above.)

END OF SECTION

BID BOND

Any singular reference to Bidder, Surety, Owner or other party shall be considered plural where applicable.

BIDDER (Name and Address):

SURETY (Name and Address of Principal Place of Business):

OWNER (Name and Address):

City of Canton
110 Academy Street
Canton, GA 30114

BID

Bid Due Date: _____

PROJECT (Brief Description Including Location)

BOND

Bond Number: _____

Date (Not earlier than Bid due date): _____

Penal Sum _____

Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of

this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond shall be Owner's sole and exclusive remedy upon default of Bidder.

2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.

3. This obligation shall be null and void if:

3.1 Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or

3.2 All Bids are rejected by Owner, or

3.3 Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).

4. Payment under this Bond will be due and payable upon default of Bidder and within 120 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.

5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from Bid due date without Surety's written consent.

6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after Bid due date.

7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.

8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.

9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.

10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.

11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

BIDDER

SURETY

Bidder's Name and Corporate Seal

Surety's Name and Corporate Seal

By: _____
Signature

By: _____
Signature (Attach Power of Attorney)

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

Note: Above addresses are to be used for giving any required notice. Provide execution by any additional parties, such as joint venturers, if necessary.

AGREEMENT

THIS AGREEMENT made by and between the City of Canton, Georgia (hereinafter called Owner) and _____ (hereinafter called Contractor).

Owner and Contractor, in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE 1 – WORK

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

Old Ballground Sanitary Sewer Phase 2 and Etowah River Trail Extension

ARTICLE 2 – ENGINEER

Atkins will act as representative, assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

ARTICLE 3 – CONTRACT TIMES

- 3.01 *Days to Achieve Substantial Completion and Final Payment* The work will be substantially completed within 510 days after the date when the contract times commence to run as provided in paragraph 2.03 of the general conditions, and completed and ready for final payment in accordance with paragraph 14.07 of the general conditions within 540 days after the date when the contract times commence to run.
- 3.02 *Liquidated Damages.* Contractor and Owner recognize that time is of the essence as stated in paragraph 3.01 above and that owner will suffer financial loss if the work is not completed within the times specified in paragraph 3.01 above, plus any extensions thereof allowed in accordance with Article 12 of the general conditions. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by owner if the work is not completed on time. Accordingly, instead of requiring any such proof, owner and contractor agree that as liquidated damages for delay (but not as a penalty), contractor shall pay owner \$500 (five hundred dollars) for each day that expires after the time specified in paragraph 3.01 above for substantial completion until the work is substantially complete. After substantial completion, if contractor shall neglect, refuse, or fail to complete the remaining work within the contract time or any proper extension thereof granted by owner, contractor shall pay owner \$250 (two hundred fifty dollars) for each day that expires after the time specified in paragraph 3.01 above for completion and readiness for final payment until the work is completed and ready for final payment.

ARTICLE 4 – CONTRACT PRICE

- 4.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents an amount in current funds equal to the sum of the amounts determined pursuant to Paragraphs 4.01.A below:
- A. For all Work, at the prices stated in Contractor's Bid, attached hereto as an exhibit.

ARTICLE 5 – PAYMENT PROCEDURES

- 5.01 *Submittal and Processing of Payments* Contractor shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.
- 5.02 *Progress Payments; Retainage* Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment on or about the **25th** day of each month during performance of the Work as provided in Paragraph 5.02.A below.
- A. All such payments will be measured by the schedule of values established as provided in Paragraph 2.07.A of the General Conditions (and in the case of Unit Price Work based on the number of units completed) plus the value of materials and equipment suitably stored, insured, and protected at the construction site, and with the Owner's consent, such materials and equipment suitably stored, insured, and protected off-site at a location approved by the Engineer, less a retainage of ten percent (10%) of each progress payment requested; provided, however, when fifty percent (50%) of the Contract Price, including change orders and other additions to the Contract, is due and the manner of completion of the contract work and its progress is reasonably satisfactory to the Engineer, in the Engineer's sole discretion, the Owner shall withhold no more retainage on additional work completed. The Contractor shall be entitled to withhold retainage from subcontractors in accordingly. At the discretion of the Owner, upon recommendation of the Engineer and with consent of the Contractor, the retainage of each subcontractor may be released separately as the subcontractor completes his work.
- B. If, after discontinuing the retainage, the Engineer determines that the work is unsatisfactory or has fallen behind schedule, retention shall be resumed at the previous level. If retention is resumed, the Contractor shall be entitled to resume withholding retainage from any affected subcontractors.
- 5.03 *Final Payment.*
- A. At substantial completion of the contract work and as the Engineer determines the work to be reasonably satisfactory, the Owner shall within 30 days after presentation of Application and other appropriate documentation as required by Article 14 of the General Conditions are provided, pay the retainage to the Contractor. If at that time there are any remaining incomplete minor items, an amount equal to 200 percent of the value of each item, as determined by the Engineer, shall be withheld until such item or items are completed. The reduced retainage shall be shared by the Contractor and subcontractors as their interests may appear. The Contractor shall, within ten (10) days from Contractor's receipt of retainage from the Owner, pass through payments to subcontractors and shall reduce each subcontractor's retainage in the same manner as the Contractor's retainage is reduced by the

Owner provided that the value of each subcontractor's work complete and in place equals fifty percent (50%) of his subcontract value, including approved change orders and other additions to the subcontract value and provided, further, that the work of the subcontractor is proceeding satisfactorily and the subcontractor has provided or provides such satisfactory reasonable assurances of continued performance and financial responsibility to complete his work including any warranty work as the Contractor in his reasonable discretion may require, including, but not limited to a payment and performance bond.

- B. The subcontractor shall, within ten (10) days from the subcontractor's receipt of retainage from the Contractor, pass through payments to the lower tier subcontractors and shall reduce each lower tier subcontractor's retainage in the same manner as the subcontractor's retainage is reduced by the Contractor, provided that the value of each lower tier subcontractor's work complete and in place equals fifty (50%) percent of his subcontract value, including approved change orders and other additions to the subcontract value and provided, further, that the work of the lower tier subcontractor is proceeding satisfactorily and the lower tier subcontractor has provided or provides such satisfactory reasonable assurances of continued performance and financial responsibility to complete his work including any warranty work as the subcontractor in his reasonable discretion may require, including, but not limited to, a payment and performance bond.
- C. All prior certificates or estimates upon which payments have been made are approximate only, and subject to correction in the final payment.

5.04 *Contractor's Agreements with Subcontractors.* The Contractor hereby covenants and agrees with Owner to obtain written agreements from each subcontractor setting forth payment procedures in accordance with the foregoing provisions of this Section. Nothing contained herein shall preclude the Contractor, prior to making payment to a subcontractor, from requiring the payee to submit satisfactory evidence that all payrolls, material bills, and other indebtedness connected with the work have been paid.

ARTICLE 6 – INTEREST

- 6.01 The Current Market Rate for this Agreement shall be the interest rate for the “Georgia Fund 1” managed by the State Office of Georgia Office of Treasury and Fiscal Services or a pro-rata portion on the principal balance.
- 6.02 All moneys not paid by Owner to Contractor when due as provided in Article 14 of the General Conditions shall bear interest at the Current Market Rate.
- 6.03 On contracts relating to installation, extension, improvement, maintenance or repair of any water or sewer facility, retainage shall be invested at the Current Market Rate and any interest earned on the retained amount shall be paid to the Contractor when the project has been completed within the Contract Times and for the Contract Price specified in the Contract, or in any amendments or change orders approved in accord with the terms of the Contract.

ARTICLE 7 – CONTRACTOR’S REPRESENTATIONS

- 7.01 In order to induce Owner to enter into this Agreement, Contractor makes the following representations:

- A. Contractor has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.
- B. Contractor has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
- C. Contractor is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.
- D. Contractor has carefully studied all: (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 the Site (except Underground Facilities), if any, that have been identified in Paragraph SC-4.02 of the Supplementary Conditions as containing reliable "technical data
- E. Contractor has considered the information known to Contractor; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Site-related reports identified in the Contract 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 Contractor, including any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Contract Documents; and (3) Contractor's safety precautions and programs.
- F. Based on the information and observations referred to in Paragraph 8.01.E above, Contractor does not consider that further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract Documents.
- G. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
- H. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
- I. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

ARTICLE 8 – CONTRACT DOCUMENTS

8.01 *Contents*

- A. The Contract Documents consist of the following:
 - 1. This Agreement (pages C520-1 to c-520-7, inclusive).
 - 2. Performance Bond (pages C610-1 to C610-3, inclusive).
 - 3. Payment Bond (pages C615-1 to C615-3, inclusive).
 - 4. General Conditions (pages C700-1 to C700-43, inclusive).
 - 5. Supplementary Conditions (pages C800-1 to C800-8, inclusive).

6. Specifications bearing the title: *Old Ballground Sanitary Sewer Replacement*
 7. Drawings consisting of 22 sheets with each bearing the following general title: *Old Ballground Sanitary Sewer Replacement*
 8. Addenda (numbers 1 to , inclusive).
 9. Exhibits to this Agreement (enumerated as follows):
 - a. Contractor's Bid (pages C-410-1 to C-410-9, inclusive).
 - b. Documentation submitted by Contractor prior to Notice of Award
 - c. Other exhibits or certifications (if applicable) accompanying this Agreement..
 10. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:
 - a. Notice to Proceed (pages _____ to _____, inclusive).
 - b. Work Change Directives.
 - c. Change Orders
- B. The documents listed in Paragraph 9.01.A are attached to this Agreement (except as expressly noted otherwise above).
- C. There are no Contract Documents other than those listed above in this Article 9.
- D. The Contract Documents may only be amended, modified, or supplemented as provided in Paragraph 3.04 of the General Conditions.

ARTICLE 9 – MISCELLANEOUS

9.01 *Terms*

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

9.02 *Assignment of Contract*

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

9.03 *Successors and Assigns*

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

9.04 *Severability*

- A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

9.05 *Contractor's Certifications*

- A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 10.05:
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 or in the Contract execution;
 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
 3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and
 4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement. Counterparts have been delivered to Owner and Contractor. All portions of the Contract Documents have been signed or have been identified by Owner and Contractor or on their behalf.

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

Owner:
City of Canton

Contractor:

Bill Grant
By (Typed Name)

By (Typed Name)

Mayor
Title

Title

Signature

Signature

[SEAL]

[SEAL]

Attest:

Attest:

Annie Fortner
City Clerk

Address for Giving Notice:
City of Canton
110 Academy Street
Canton, Georgia 30114

Address for Giving Notice:

Approved as to form

Robert M. Dyer,
Attorney, City of Canton

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

NON-COLLUSION AFFIDAVIT OF BIDDER

STATE OF GEORGIA

COUNTY OF CHEROKEE

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

He or she is _____ of
(Owner, Partner, Officer, Representative or Agent)

_____, 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 Canton, Georgia, 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) _____

(Title) _____

Subscribed and Sworn before me this _____ day of _____, 20____

(Notary Public) *(signature)*

My Commission Expires: _____

(SEAL)

O.C.G.A. § 50-36-1(e)(2) Affidavit

By executing this affidavit under oath, as an applicant for a City of Canton contract for public benefit as referenced in O.C.G.A § 50-36-1, I am stating the following with respect to my application for a City of Canton contract for public benefit:

- 1) _____ I am a United States citizen
- 2) _____ I am a legal permanent resident of the United States
- 3) _____ I am a qualified alien or non-immigrant under Federal Immigration and Nationality Act with an alien number issued by the Department of Homeland Security or other federal immigration agency.

My alien number issued by the Department of Homeland Security or other federal immigration agency is: _____

The undersigned applicant also hereby verifies that he or she is 18 years or older and has provided at least one secure and verifiable document, as required by O.C.G.A. § 50-36-1(e)(1), with this affidavit.

The secure and verifiable document provided with this affidavit can best be classified as:

_____.

In making the above representation under oath, I understand that any person who knowingly and willfully makes a false, fictitious, or fraudulent statement or representation in an affidavit shall be guilty of a violation of O.C.G.A. § 16-10-20, and face criminal penalties as allowed by such criminal statute.

Executed in _____ (city), _____ (state).

Signature of Applicant

Date:

Printed Name of Applicant

Sworn to and subscribed before me

This _____ day of _____, 20____

Notary Public

My commission expires: _____

SECURITY AND IMMIGRATION COMPLIANCE ACT CERTIFICATION

Pursuant to the Georgia Security and Immigration Compliance Act of 2006, Contractor understands and agrees that compliance with the requirements of OCGA 13-10-91 and Georgia Department of Labor Rule 300-10-1 et. seq. are conditions of Agreement. Contractor further agrees that such compliance shall be attested through execution of Contractor Affidavit and Agreement required by Georgia Department of Labor Rule 300-10-1-.07, or a substantially similar contractor affidavit. Contractor’s fully executed affidavit is attached and is incorporated into this Agreement by reference herein.

By initialing in the appropriate line below, Contractor certifies that the following employee number category as identified in OCGA 13-10-91 is applicable to Contractor:

- 1. _____ 500 or more employees;
- 2. _____ 100 or more employees;
- 3. _____ Fewer than 100 employees.

Contractor understands and agrees that, in the event Contractor employs or contracts with Subcontractor in connection with this Agreement, Contractor shall:

- 1. Secure from each Subcontractor an indication of the employee-number category as identified in OCGA 13-10-91; and
- 2. Secure from each Subcontractor an attestation of Subcontractor’s compliance with OCGA 13-10-91 and Georgia Department of Labor Rule 300-10-1-.02 by causing each Subcontractor to execute the attached Subcontractor Affidavit required by Georgia Department of Labor Rule 300-10-1-.08, or a substantially similar subcontractor affidavit. Contractor further understands and agrees that Contractor shall require the executed Subcontractor Affidavit to become a part of the agreement between Contractor and each Subcontractor. Contractor agrees to maintain records of each Subcontractor attestation required hereunder for inspection by Owner.

BY: Authorized Officer or Agent

Date

Title of Authorized Officer or Agent if Contractor

Printed Name of Authorized Officer or Agent

Subscribed and Sworn Before Me on this
_____ day of _____, 20____

Notary Public
My Commission Expires:

Contractor Affidavit Under O.C.G.A. § 13-10-91(b)(1)

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 the City of Canton 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 applicability provisions and deadlines 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 and the undersigned contractor will contract for the physical performance of services in satisfaction of such contract only with subcontractors who present an affidavit to the contractor with the information required by O.C.G.A. § 13-10-91(b). Contractor hereby attests that its federal work authorization user identification number and date of authorization are as follows:

Federal Work Authorization User Identification No.: _____

Date of Authorization: _____

Name of Contractor: _____

Name of Project: Old Ballground Sanitary Sewer Phase 2 and Etowah River Trail Extension

Name of Public Employer: City of Canton, Georgia

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

Printed Name and Title of Authorized Officer or Agent

Sworn to and subscribed before me

This _____ day of _____, 20__

Notary Public

My commission expires: _____

Subcontractor Affidavit Under O.C.G.A. § 13-10-91(b)(3)

By executing this affidavit, the undersigned subcontractor 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 contract with _____ (name of contractor) on behalf of the City of Canton 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 applicability provisions and deadlines in O.C.G.A. § 13-10-91. Furthermore, the undersigned subcontractor will continue to use the federal work authorization program throughout the contract period and the undersigned subcontractor will contract for the physical performance of services in satisfaction of such contract only with sub-subcontractors who present an affidavit to the subcontractor with the information required by O.C.G.A. § 13-10-91(b). Additionally, the undersigned subcontractor will forward notice of the receipt of an affidavit from a sub-subcontractor to the contractor within five business days of receipt. If the undersigned subcontractor receives notice that a sub-subcontractor has received an affidavit from any other contracted sub-subcontractor, the undersigned subcontractor must forward, within five business days of receipt, a copy of the notice to the contractor. Subcontractor hereby attests that its federal work authorization user identification number and date of authorization are as follows:

Federal Work Authorization User Identification No.: _____

Date of Authorization: _____

Name of Subcontractor: _____

Name of Project: Old Ballground Sanitary Sewer Phase 2 and Etowah River Trail Extension

Name of Public Employer: City of Canton, Georgia

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

Printed Name and Title of Authorized Officer or Agent

Sworn to and subscribed before me

This _____ day of _____, 20__

Notary Public

My commission expires: _____

PERFORMANCE BOND

CONTRACTOR (name and address):

SURETY (name and address of principal place of business):

OWNER (name and address):

City of Canton
110 Academy Street
Canton, GA 30114

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description (name and location):

Old Ballground Sanitary Sewer Phase 2 and Etowah River Trail Extension in Canton, GA.

BOND

Bond Number:

Date (not earlier than the Effective Date of the Agreement of the Construction Contract):

Amount:

Modifications to this Bond Form: [] None [] See Paragraph 16

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

SURETY

Contractor's Name and Corporate Seal (seal)

Surety's Name and Corporate Seal (seal)

By: Signature

By: Signature (attach power of attorney)

Print Name

Print Name

Title

Title

Attest: Signature

Attest: Signature

Title

Title

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers.(2)Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Paragraph 3.

3. If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after:

3.1 The Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor, and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Paragraph 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor, and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;

3.2 The Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

3.3 The Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

4. Failure on the part of the Owner to comply with the notice requirement in Paragraph 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

5. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owners concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 7 in excess

of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:

5.4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

5.4.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

6. If the Surety does not proceed as provided in Paragraph 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Paragraph 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication for:

7.1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

7.2 additional legal, design professional, and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 5; and

7.3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

8. If the Surety elects to act under Paragraph 5.1, 5.3, or 5.4, the Surety's liability is limited to the amount of this Bond.

9. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors, and assigns.

10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.

11. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

14. Definitions

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

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

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

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

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

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

16. Modifications to this Bond are as follows:

PAYMENT BOND

CONTRACTOR (name and address):

SURETY (name and address of principal place of business):

OWNER (name and address):

City of Canton, GA
110 Academy Street
Canton, GA 30114

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description (name and location):

Old Ballground Sanitary Sewer Phase 2 and Etowah River Trail Extension in Canton, GA

BOND

Bond Number:

Date (not earlier than the Effective Date of the Agreement of the Construction Contract):

Amount:

Modifications to this Bond Form None See Paragraph 18

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

SURETY

Contractor's Name and Corporate Seal (seal)

Surety's Name and Corporate Seal (seal)

By: _____
Signature

By: _____
Signature (attach power of attorney)

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers.(2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials, and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.
2. If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.
3. If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.
4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.
5. The Surety's obligations to a Claimant under this Bond shall arise after the following:
 - 5.1 Claimants who do not have a direct contract with the Contractor,
 - 5.1.1 have furnished a written notice of non-payment to the

Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and

5.1.2 have sent a Claim to the Surety (at the address described in Paragraph 13).

5.2 Claimants who are employed by or have a direct contract with the Contractor have sent a Claim to the Surety (at the address described in Paragraph 13).

6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.

7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

7.2 Pay or arrange for payment of any undisputed amounts.

- 7.3 The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.
8. The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.
9. Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.
10. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.
11. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.
12. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.
13. Notice and Claims to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.
14. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.
15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

16. Definitions

16.1 **Claim:** A written statement by the Claimant including at a minimum:

1. The name of the Claimant;
2. The name of the person for whom the labor was done, or materials or equipment furnished;
3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;
4. A brief description of the labor, materials, or equipment furnished;
5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;
7. The total amount of previous payments received by the Claimant; and
8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.

16.2 **Claimant:** An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms of "labor, materials, or equipment" that part of the water, gas, power, light,

heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

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

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

16.5 **Contract Documents:** All the documents that comprise the agreement between the Owner and Contractor.

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

18. Modifications to this Bond are as follows:

STANDARD GENERAL CONDITIONS OF THE
CONSTRUCTION CONTRACT

TABLE OF CONTENTS

	Page
Article 1 – Definitions and Terminology	4
1.01 Defined Terms.....	4
1.02 Terminology.....	7
Article 2 – Preliminary Matters.....	8
2.01 Delivery of Bonds and Evidence of Insurance.....	8
2.02 Copies of Documents.....	8
2.03 Commencement of Contract Times; Notice to Proceed	8
2.04 Starting the Work.....	8
2.05 Before Starting Construction	8
2.06 Preconstruction Conference; Designation of Authorized Representatives	9
2.07 Initial Acceptance of Schedules	9
Article 3 – Contract Documents: Intent, Amending, Reuse.....	9
3.01 Intent.....	9
3.02 Reference Standards	9
3.03 Reporting and Resolving Discrepancies	10
3.04 Amending and Supplementing Contract Documents	10
3.05 Reuse of Documents	11
3.06 Electronic Data.....	11
Article 4 – Availability of Lands; Subsurface and Physical Conditions; Hazardous Environmental Conditions; Reference Points	11
4.01 Availability of Lands	11
4.02 Subsurface and Physical Conditions	12
4.03 Differing Subsurface or Physical Conditions.....	12
4.04 Underground Facilities	13
4.05 Reference Points	14
4.06 Hazardous Environmental Condition at Site.....	14
Article 5 – Bonds and Insurance	16
5.01 Performance, Payment, and Other Bonds	16
5.02 Licensed Sureties and Insurers	16
5.03 Certificates of Insurance	16
5.04 Contractor’s Insurance.....	17
5.05 Owner’s Liability Insurance	18
5.06 Property Insurance	18
5.07 Waiver of Rights	19
5.08 Receipt and Application of Insurance Proceeds	20
5.09 Acceptance of Bonds and Insurance; Option to Replace.....	20
5.10 Partial Utilization, Acknowledgment of Property Insurer.....	21

Article 6 – Contractor’s Responsibilities	21
6.01 Supervision and Superintendence	21
6.02 Labor; Working Hours.....	21
6.03 Services, Materials, and Equipment	21
6.04 Progress Schedule	21
6.05 Substitutes and “Or-Equals”	22
6.06 Concerning Subcontractors, Suppliers, and Others	24
6.07 Patent Fees and Royalties	25
6.08 Permits.....	25
6.09 Laws and Regulations.....	26
6.10 Taxes	26
6.11 Use of Site and Other Areas	26
6.12 Record Documents.....	27
6.13 Safety and Protection	27
6.14 Safety Representative	28
6.15 Hazard Communication Programs	28
6.16 Emergencies	28
6.17 Shop Drawings and Samples	28
6.18 Continuing the Work	29
6.19 Contractor’s General Warranty and Guarantee.....	30
6.20 Indemnification	30
6.21 Delegation of Professional Design Services	31
Article 7 – Other Work at the Site.....	31
7.01 Related Work at Site	31
7.02 Coordination.....	32
7.03 Legal Relationships.....	32
Article 8 – Owner’s Responsibilities	32
8.01 Communications to Contractor.....	32
8.02 Replacement of Engineer.....	32
8.03 Furnish Data	32
8.04 Pay When Due	33
8.05 Lands and Easements; Reports and Tests	33
8.06 Insurance	33
8.07 Change Orders.....	33
8.08 Inspections, Tests, and Approvals.....	33
8.09 Limitations on Owner’s Responsibilities	33
8.10 Undisclosed Hazardous Environmental Condition.....	33
8.11 Evidence of Financial Arrangements	33
8.12 Compliance with Safety Program.....	33
Article 9 – Engineer’s Status During Construction	33
9.01 Owner’s Representative.....	33
9.02 Visits to Site	33
9.03 Project Representative	34
9.04 Authorized Variations in Work	34
9.05 Rejecting Defective Work	34
9.06 Shop Drawings, Change Orders and Payments	34

9.07	Determinations for Unit Price Work	34
9.08	Decisions on Requirements of Contract Documents and Acceptability of Work	35
9.09	Limitations on Engineer’s Authority and Responsibilities.....	35
9.10	Compliance with Safety Program.....	35
Article 10 – Changes in the Work; Claims		36
10.01	Authorized Changes in the Work	36
10.02	Unauthorized Changes in the Work	36
10.03	Execution of Change Orders.....	36
10.04	Notification to Surety.....	36
10.05	Claims.....	36
Article 11 – Cost of the Work; Allowances; Unit Price Work.....		37
11.01	Cost of the Work.....	37
11.02	Allowances.....	39
11.03	Unit Price Work	40
Article 12 – Change of Contract Price; Change of Contract Times.....		40
12.01	Change of Contract Price.....	40
12.02	Change of Contract Times	41
12.03	Delays.....	41
Article 13 – Tests and Inspections; Correction, Removal or Acceptance of Defective Work.....		42
13.01	Notice of Defects	42
13.02	Access to Work	42
13.03	Tests and Inspections	42
13.04	Uncovering Work.....	43
13.05	Owner May Stop the Work.....	43
13.06	Correction or Removal of Defective Work.....	43
13.07	Correction Period.....	44
13.08	Acceptance of Defective Work	44
13.09	Owner May Correct Defective Work	45
Article 14 – Payments to Contractor and Completion.....		45
14.01	Schedule of Values	45
14.02	Progress Payments	45
14.03	Contractor’s Warranty of Title	47
14.04	Substantial Completion.....	48
14.05	Partial Utilization	48
14.06	Final Inspection.....	49
14.07	Final Payment	49
14.08	Final Completion Delayed.....	50
14.09	Waiver of Claims	50
Article 15 – Suspension of Work and Termination.....		50
15.01	Owner May Suspend Work	50
15.02	Owner May Terminate for Cause.....	51
15.03	Owner May Terminate For Convenience.....	52
15.04	Contractor May Stop Work or Terminate	52

Article 16 – Dispute Resolution	52
16.01 Methods and Procedures	52
Article 17 – Miscellaneous	53
17.01 Giving Notice	53
17.02 Computation of Times	53
17.03 Cumulative Remedies	53
17.04 Survival of Obligations	53
17.05 Controlling Law	53
17.06 Headings	53

ARTICLE 1 – Definitions And Terminology

1.01 *Defined Terms*

A. Wherever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

1. *Addenda* - Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
2. *Agreement*—The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.
3. *Application for Payment*—The form acceptable to Engineer which is to be used by 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.
4. *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.
5. *Bid*—The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
6. *Bidder*—The individual or entity who submits a Bid directly to Owner.
7. *Bidding Documents*—The Bidding Requirements and the proposed Contract Documents (including all Addenda).

8. *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.
9. *Change Order*—A document recommended by Engineer which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.
10. *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.
11. *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.
12. *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.
13. *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).
14. *Contract Times*—The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any; (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer's written recommendation of final payment.

15. *Contractor*—The individual or entity with whom Owner has entered into the Agreement.
16. *Cost of the Work*—See Paragraph 11.01 for definition.
17. *Drawings*—That part of the Contract Documents prepared or approved by Engineer 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.
18. *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.
19. *Engineer*—The individual or entity named as such in the Agreement.
20. *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.
21. *General Requirements*—Sections of Division 1 of the Specifications.
22. *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.
23. *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.
24. *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.
25. *Liens*—Charges, security interests, or encumbrances upon Project funds, real property, or personal property.
26. *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.
27. *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.
28. *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.
29. *Owner*—The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.
30. *PCBs*—Polychlorinated biphenyls.
31. *Petroleum*—Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60° 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.
32. *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.
33. *Project*—The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.
34. *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.

35. *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.
36. *Resident Project Representative*—The authorized representative of Engineer who may be assigned to the Site or any part thereof.
37. *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.
38. *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.
39. *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.
40. *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.
41. *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.

42. *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.
43. *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.
44. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.
45. *Successful Bidder*—The Bidder submitting a responsive Bid to whom Owner makes an award.
46. *Supplementary Conditions*—That part of the Contract Documents which amends or supplements these General Conditions.
47. *Supplier*—A manufacturer, fabricator, supplier, distributor, material man, 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.
48. *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.

49. *Unit Price Work*—Work to be paid for on the basis of unit prices.
50. *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.
51. *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. The words and terms discussed in Paragraph 1.02.B through F are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. Intent of Certain Terms or Adjectives:
 1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,”

“suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09 or any other provision of the Contract Documents.

C. Day:

1. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.

D. Defective:

1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
 2. does not conform to the Contract Documents; or
 3. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 4. 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).
5. Furnish, Install, Perform, Provide:

6. 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.
7. 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.
8. 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.
9. 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.
10. 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. When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.
- B. *Evidence of Insurance:* Before any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance

which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with Article 5.

2.02 Copies of Documents

- A. Owner shall furnish to Contractor up to ten printed or hard copies of the Drawings and Project Manual. Additional copies will be furnished upon request at the cost of reproduction.

2.03 Commencement of Contract Times; Notice to Proceed

- A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

2.04 Starting the Work

- A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

2.05 Before Starting Construction

- A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), Contractor shall submit to Engineer for timely review:
 1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;
 2. a preliminary Schedule of Submittals; and

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

2.06 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit instructions, receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.07 *Initial Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference attended by Contractor, Engineer, and others as appropriate will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.

1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

ARTICLE 3 – Contract Documents: 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. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that reasonably may be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the indicated result will be provided whether or not specifically called for, at no additional cost to Owner.
- C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

3.02 *Reference Standards*

- A. Standards, Specifications, Codes, Laws, and Regulations
 1. Reference to standards, specifications, manuals, or codes of any technical

society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard, specification, manual, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 *Reporting and Resolving Discrepancies*

A. Reporting Discrepancies:

1. *Contractor's Review of Contract Documents Before Starting Work:* Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor discovers, or has actual knowledge of, and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.
2. *Contractor's Review of Contract Documents During Performance of Work:* If, during the performance of the Work,

Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) any standard, specification, manual, or code, or (c) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.

3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. Resolving Discrepancies:

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:
 - a. the provisions of any standard, specification, manual, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference in the Contract Documents); or
 - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Amending and Supplementing Contract Documents*

- A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and

conditions thereof by either a Change Order or a Work Change Directive.

- B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:
1. A Field Order;
 2. Engineer's approval of a Shop Drawing or Sample (subject to the provisions of Paragraph 6.17.D.3); or
 3. Engineer's written interpretation or clarification.

3.05 *Reuse of Documents*

- A. Contractor and any Subcontractor or Supplier shall not:
1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions; or
 2. reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer.
- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

3.06 *Electronic Data*

- A. Unless otherwise stated in the Supplementary Conditions, the data furnished by Owner or Engineer to Contractor, or by Contractor to Owner or Engineer, that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or

information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.

- B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party.
- C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

ARTICLE 4 – Availability of Lands; Subsurface and Physical Conditions; Hazardous Environmental Conditions; Reference Points

4.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.02 *Subsurface and Physical Conditions*

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

1. those reports known to Owner of explorations and tests of subsurface conditions at or contiguous to the Site; and
2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).

B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

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. is of such a nature as to establish that any "technical data" on which Contractor is entitled to rely as provided in Paragraph 4.02 is materially inaccurate; or
2. is of such a nature as to require a change in the Contract Documents; or
3. differs materially from that shown or indicated in the Contract Documents; or
4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;
5. then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

B. *Engineer's Review:* After receipt of written notice as required by Paragraph 4.03.A, Engineer will promptly review the pertinent condition, determine the necessity of Owner's obtaining additional exploration or tests with respect thereto, and advise Owner in writing (with a copy to Contractor) of Engineer's findings and conclusions.

C. *Possible Price and Times Adjustments:*

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
 - a. such condition must meet any one or more of the categories described in Paragraph 4.03.A; and
 - b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.07 and 11.03.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:
 - a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or
 - b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or
 - c. Contractor failed to give the written notice as required by Paragraph 4.03.A.
3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided

in Paragraph 10.05. However, neither Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

4.04 *Underground Facilities*

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

1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data provided by others; and
2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
 - a. reviewing and checking all such information and data;
 - b. locating all Underground Facilities shown or indicated in the Contract Documents;
 - c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction; and
 - d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. *Not Shown or Indicated:*

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.05.

4.05 *Reference Points*

- A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.06 *Hazardous Environmental Condition at Site*

- A. *Reports and Drawings:* The Supplementary Conditions identify those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at the Site.
- B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:
 1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto;or

2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
 3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.
- D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 4.06.E.
- E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered written notice to Contractor: (i) specifying that such condition and any affected area is or has been rendered safe for

the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.

- F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.
- G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph

4.06.G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

- H. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5 – Bonds And Insurance

5.01 Performance, Payment, and Other Bonds

- A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.
- B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall

be executed by such sureties as are 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 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed each bond.

- C. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

5.02 Licensed Sureties and Insurers

- A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Owner or Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

5.03 Certificates of Insurance

- A. Contractor shall deliver to Owner, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.

- B. Owner shall deliver to Contractor, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.
- C. Failure of Owner to demand such certificates or other evidence of Contractor's full compliance with these insurance requirements or failure of Owner to identify a deficiency in compliance from the evidence provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance.
- D. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor.
- E. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner in the Contract Documents.

5.04 *Contractor's Insurance*

- A. Contractor shall purchase and maintain such insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:
 - 1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;
 - 2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;
 - 3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;

- 4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:
 - a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or
 - b. by any other person for any other reason;
 - 5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and
 - 6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.
- 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 inclusive, be written on an occurrence basis, include as additional insureds (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;
 - 2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;
 - 3. include contractual liability insurance covering Contractor's indemnity

obligations under Paragraphs 6.11 and 6.20;

4. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);
5. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and
6. include completed operations coverage:
 - a. Such insurance shall remain in effect for two years after final payment.
 - b. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

5.05 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 5.04, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.

5.06 *Property Insurance*

- A. Unless otherwise provided in the Supplementary Conditions, Owner shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such

deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:

1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee;
2. be written on a Builder's Risk "all-risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage (other than that caused by flood), and such other perils or causes of loss as may be specifically required by the Supplementary Conditions.
3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);
4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;
5. allow for partial utilization of the Work by Owner;
6. include testing and startup; and
7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and

Engineer with 30 days written notice to each other loss payee to whom a certificate of insurance has been issued.

- B. Owner shall purchase and maintain such equipment breakdown insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee.
- C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other loss payee to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.
- D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.
- E. If Contractor requests in writing that other special insurance be included in the property insurance policies provided under this Paragraph 5.06, Owner shall, if possible, include such insurance, and the cost thereof

will be charged to Contractor by appropriate Change Order. Prior to commencement of the Work at the Site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.

5.07 *Waiver of Rights*

- A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or loss payees thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) under such policies for losses and damages so caused. 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. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners,

employees, agents, consultants and subcontractors of each and any of them for:

1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and
 2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them.

5.08 *Receipt and Application of Insurance Proceeds*

- A. Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Owner and made payable to Owner as fiduciary for the loss payees, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost

thereof covered by an appropriate Change Order.

- B. Owner as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Owner as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, Owner as fiduciary shall give bond for the proper performance of such duties.

5.09 *Acceptance of Bonds and Insurance; Option to Replace*

- A. If either Owner or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.01.B. Owner and Contractor shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

- A. If Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

ARTICLE 6 – Contractor’s Responsibilities

6.01 *Supervision and Superintendence*

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

6.02 *Labor; Working Hours*

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.

- B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner’s written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

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 incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
- C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

6.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 as it may be adjusted from time to time as provided below.
 - 1. Contractor shall submit to Engineer for acceptance (to the extent indicated in

Paragraph 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

6.05 *Substitutes and "Or-Equals"*

A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.

1. "*Or-Equal*" Items: If in Engineer's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an "or-equal" item, in which case review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:
 - a. in the exercise of reasonable judgment Engineer determines that:

- 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
- 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole; and
- 3) it has a proven record of performance and availability of responsive service.

b. Contractor certifies that, if approved and incorporated into the Work:

- 1) there will be no increase in cost to the Owner or increase in Contract Times; and
- 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

2. Substitute Items:

- a. If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.
- b. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.
- c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented by the General Requirements, and as Engineer may

decide is appropriate under the circumstances.

d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:

1) shall certify that the proposed substitute item will:

- a) perform adequately the functions and achieve the results called for by the general design,
- b) be similar in substance to that specified, and
- c) be suited to the same use as that specified;

2) will state:

- a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time,
- b) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and
- c) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;

3) will identify:

- a) all variations of the proposed substitute item from that specified, and

b) available engineering, sales, maintenance, repair, and replacement services; and

4) shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change.

B. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.

C. *Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by a Change Order in the case of a substitute and an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.

D. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

E. *Engineer's Cost Reimbursement:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by

Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

F. *Contractor's Expense:* Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

6.06 *Concerning Subcontractors, Suppliers, and Others*

A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.

B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor,

Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.

C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity; nor
2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.

E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.

F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or

Suppliers or delineating the Work to be performed by any specific trade.

- G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as a loss payee on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

6.07 *Patent Fees and Royalties*

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

disclosed by Owner in the Contract Documents.

- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.08 *Permits*

- A. Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees

necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

6.09 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.
- C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

6.10 *Taxes*

- A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which

are applicable during the performance of the Work.

6.11 *Use of Site and Other Areas*

A. Limitation on Use of Site and Other Areas:

- 1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.
- 2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.
- 3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.

- B. *Removal of Debris During Performance of the Work:* During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials,

rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

- C. *Cleaning*: Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.
- D. *Loading Structures*: Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

6.12 *Record Documents*

- A. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to Engineer for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to Engineer for Owner.

6.13 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the

necessary protection to prevent damage, injury or loss to:

1. all persons on the Site or who may be affected by the Work;
 2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.
 - C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.
 - D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.
 - E. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or

omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

- F. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 *Safety Representative*

- A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

6.15 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

6.16 *Emergencies*

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

6.17 *Shop Drawings and Samples*

- A. Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals (as required by Paragraph 2.07). Each submittal will be identified as Engineer may require.

1. Shop Drawings:

- a. Submit number of copies specified in the General Requirements.
- b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 6.17.D.

2. Samples:

- a. Submit number of Samples specified in the Specifications.
- b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 6.17.D.

- B. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. Submittal Procedures:

1. Before submitting each Shop Drawing or Sample, Contractor shall have:
 - a. reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the

requirements of the Work and the Contract Documents;

- b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
 - c. determined and verified the suitability of all materials offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
 - d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.
2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval of that submittal.
 3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawings or Sample submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

D. Engineer's Review:

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by

the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

E. Resubmittal Procedures:

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

6.18 *Continuing the Work*

- A. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or

disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraph 15.04 or as Owner and Contractor may otherwise agree in writing.

6.19 Contractor's General Warranty and Guarantee

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on representation of Contractor's warranty and guarantee.
- B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
 2. normal wear and tear under normal usage.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:
1. observations by Engineer;
 2. recommendation by Engineer or payment by Owner of any progress or final payment;
 3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
 4. use or occupancy of the Work or any part thereof by Owner;
 5. any review and approval of a Shop Drawing or Sample submittal or the

issuance of a notice of acceptability by Engineer;

6. any inspection, test, or approval by others; or
7. any correction of defective Work by Owner.

6.20 Indemnification

- A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable .
- B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor,

Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:

1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

6.21 *Delegation of Professional Design Services*

A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.

B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear

such professional's written approval when submitted to Engineer.

C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.

D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.

E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

ARTICLE 7 – Other Work at the Site

7.01 *Related Work at Site*

A. Owner may perform other work related to the Project at the Site with Owner's employees, or through other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:

1. written notice thereof will be given to Contractor prior to starting any such other work; and
2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.

B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner, and Owner, if Owner is

performing other work with Owner's employees, proper and safe access to the Site, provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.

- C. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 7, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

7.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:
1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;

2. the specific matters to be covered by such authority and responsibility will be itemized; and
3. the extent of such authority and responsibilities will be provided.

- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

7.03 *Legal Relationships*

- A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.
- B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's wrongful actions or inactions.
- C. Contractor shall be liable to Owner and any other contractor under direct contract to Owner for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's wrongful action or inactions.

ARTICLE 8 – Owner's Responsibilities

8.01 *Communications to Contractor*

- A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

8.02 *Replacement of Engineer*

- A. In case of termination of the employment of Engineer, Owner shall appoint an engineer to whom Contractor makes no reasonable objection, whose status under the Contract Documents shall be that of the former Engineer.

8.03 *Furnish Data*

- A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

8.04 *Pay When Due*

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

8.05 *Lands and Easements; Reports and Tests*

- A. Owner's duties with respect to providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

8.06 *Insurance*

- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 5.

8.07 *Change Orders*

- A. Owner is obligated to execute Change Orders as indicated in Paragraph 10.03.

8.08 *Inspections, Tests, and Approvals*

- A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 13.03.B.

8.09 *Limitations on Owner's Responsibilities*

- A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

8.10 *Undisclosed Hazardous Environmental Condition*

- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 4.06.

8.11 *Evidence of Financial Arrangements*

- A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents.

8.12 *Compliance with Safety Program*

- A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed pursuant to Paragraph 6.13.D.

ARTICLE 9 – Engineer's Status During Construction

9.01 *Owner's Representative*

- A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract Documents.

9.02 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will

conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 9.09. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

9.03 *Project Representative*

- A. If Owner and Engineer agree, Engineer will furnish a Resident Project Representative to assist Engineer in providing more extensive observation of the Work. The authority and responsibilities of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 9.09. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

9.04 *Authorized Variations in Work*

- A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor,

who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

9.05 *Rejecting Defective Work*

- A. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

9.06 *Shop Drawings, Change Orders and Payments*

- A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.
- B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.
- C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.
- D. In connection with Engineer's authority as to Applications for Payment, see Article 14.

9.07 *Determinations for Unit Price Work*

- A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written

decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of Paragraph 10.05.

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

- A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question.
- B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believes that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.
- C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.
- D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such

authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with, the Contract Documents.
- E. The limitations upon authority and responsibility set forth in this Paragraph 9.09 shall also apply to the Resident Project Representative, if any, and assistants, if any.

9.10 *Compliance with Safety Program*

- A. While at the Site, Engineer's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Engineer has been informed pursuant to Paragraph 6.13.D.

ARTICLE 10 – Changes In The Work; Claims

10.01 *Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).
- B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

10.02 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.D.

10.03 *Execution of Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:
 - 1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;
 - 2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount

of time for Work actually performed in accordance with a Work Change Directive; and

- 3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

10.04 *Notification to Surety*

- A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

10.05 *Claims*

- A. *Engineer's Decision Required:* All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.
- B. *Notice:* Written notice stating the general nature of each Claim shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered

to the Engineer and the other party to the Contract within 60 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Times shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).

- C. *Engineer's Action:* Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:
1. deny the Claim in whole or in part;
 2. approve the Claim; or
 3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.
- D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.
- E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.
- F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not

submitted in accordance with this Paragraph 10.05.

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

11.01 Cost of the Work

A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 11.01.B, and shall include only the following items:

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be

included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.
3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.
4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
5. Supplemental costs including the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.

- b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
- c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.
- d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
- e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
- f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.06.D), provided such losses and damages have resulted from causes other than the negligence of Contractor, any

Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

- g. The cost of utilities, fuel, and sanitary facilities at the Site.
- h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, express and courier services, and similar petty cash items in connection with the Work.
- i. The costs of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain.

B. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

- 1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), 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 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, all of which are to be considered administrative costs covered by the Contractor's fee.
- 2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.

- 3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
- 4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
- 5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A.

C. *Contractor's Fee:* When all the Work is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.

D. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

11.02 Allowances

A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

B. *Cash Allowances:*

- 1. Contractor agrees that:
 - a. the cash allowances include the cost to Contractor (less any applicable trade

discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

- b. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

C. *Contingency Allowance:*

- 1. Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

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

11.03 *Unit Price Work*

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

- D. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:

- 1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and
- 2. there is no corresponding adjustment with respect to any other item of Work; and
- 3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

**ARTICLE 12 – Change of Contract Price;
Change of Contract Times**

12.01 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.
- B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:
 - 1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or
 - 2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or
 - 3. where the Work involved is not covered by unit prices contained in the Contract

Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).

C. *Contractor's Fee:* The Contractor's fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or
2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be 15 percent;
 - b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five percent;
 - c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 12.01.C.2.a and 12.01.C.2.b is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;
 - d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;
 - e. the amount of credit to be allowed by Contractor to Owner for any change which 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. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

12.02 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.
- B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

12.03 *Delays*

- A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.
- B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment

being essential to Contractor's ability to complete the Work within the Contract Times.

- C. If Contractor is delayed in the performance or progress of the Work by 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 not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.C.
- D. Owner, Engineer, and their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.
- E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

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

13.01 Notice of Defects

- A. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor. Defective Work may be rejected, corrected, or accepted as provided in this Article 13.

13.02 Access to Work

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner,

independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

13.03 Tests and Inspections

- A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.
- B. Owner shall employ and pay 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 in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in Paragraph 13.04.C; and
 3. as otherwise specifically provided in the Contract Documents.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.
- D. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or

equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.

- E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation.
- F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

13.04 *Uncovering Work*

- A. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.
- B. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.
- C. If it is found that the uncovered Work is defective, Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or

replacement of work of others); and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05.

- D. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

13.05 *Owner May Stop the Work*

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

13.06 *Correction or Removal of Defective Work*

- A. Promptly after receipt of written notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).

B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

13.07 *Correction Period*

A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. repair such defective land or areas; or
2. correct such defective Work; or
3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.

B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair

or replacement of work of others) will be paid by Contractor.

C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.

D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

E. Contractor's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

13.08 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Owner may do so. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness) and for the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Engineer's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the

parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

13.09 *Owner May Correct Defective Work*

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days written notice to Contractor, correct, or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 13.09, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.
- C. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the

necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 13.09.

ARTICLE 14 – Payments to Contractor and Completion

14.01 *Schedule of Values*

- A. The Schedule of Values established as provided in Paragraph 2.07.A will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.02 *Progress Payments*

A. *Applications for Payments:*

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale,

invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

B. Review of Applications:

1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:
 - a. the Work has progressed to the point indicated;
 - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation

of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and any other qualifications stated in the recommendation); and

- c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
 - a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or
 - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
 - a. to supervise, direct, or control the Work, or
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or

- c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
 - d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or
 - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:
- a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;
 - c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or
 - d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

C. Payment Becomes Due:

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by Owner to Contractor.

D. Reduction in Payment:

1. Owner may refuse to make payment of the full amount recommended by Engineer because:
 - a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;
 - b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;
 - c. there are other items entitling Owner to a set-off against the amount recommended; or
 - d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.
2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, when Contractor remedies the reasons for such action.
3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by 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 covered by any Application for Payment, whether

incorporated in the Project or not, will pass to Owner no later than the time of payment free and clear of all Liens.

14.04 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion.
- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the tentative certificate to Owner, notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will, within said 14 days, execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.
- 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. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.

- E. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the tentative list.

14.05 *Partial Utilization*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:
 - 1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 14.04.A through D for that part of the Work.
 - 2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready

for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

14.06 *Final Inspection*

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

14.07 *Final Payment*

A. *Application for Payment:*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments.
2. The final Application for Payment shall be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.6;
 - b. consent of the surety, if any, to final payment;
 - c. a list of all Claims against Owner that Contractor believes are unsettled; and
 - d. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise

satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

B. Engineer's Review of Application and Acceptance:

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract Documents have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of payment and present the Application for Payment to Owner for payment. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable subject to the provisions of Paragraph 14.09. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. Payment Becomes Due:

1. Thirty days after the presentation to Owner of the Application for Payment and accompanying documentation, the amount recommended by Engineer, less any sum Owner is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages, will become due and will be paid by Owner to Contractor.

14.08 Final Completion Delayed

- A. If, through no fault of Contractor, final completion of the Work is significantly

delayed, and if Engineer so confirms, Owner shall, upon receipt of Contractor's final Application for Payment (for Work fully completed and accepted) and recommendation of Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by Owner for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to Engineer with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

14.09 Waiver of Claims

- A. The making and acceptance of final payment will constitute:
 1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and
 2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

ARTICLE 15 – Suspension of Work and Termination

15.01 Owner May Suspend Work

- A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to Contractor and Engineer which will fix the date on which

Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefor as provided in Paragraph 10.05.

15.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events will justify termination for cause:

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);
2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;
3. Contractor's repeated disregard of the authority of Engineer; or
4. Contractor's violation in any substantial way of any provisions of the Contract Documents.

B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:

1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion);
2. incorporate in the Work all materials and equipment stored at the Site or for which

Owner has paid Contractor but which are stored elsewhere; and

3. complete the Work as Owner may deem expedient.

C. If Owner proceeds as provided in Paragraph 15.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.

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

F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B and 15.02.C.

15.03 *Owner May Terminate For Convenience*

- A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;
 3. all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and
 4. reasonable expenses directly attributable to termination.
- B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days

written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.

- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this Paragraph.

ARTICLE 16 – Dispute Resolution

16.01 *Methods and Procedures*

- A. Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation will be governed 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 participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.

C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:

1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions; or
2. agrees 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 any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:

1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended; or
2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.02 Computation of Times

A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

17.03 Cumulative Remedies

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of

them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract 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 apply.

17.04 Survival of Obligations

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive 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 law of the state in which the Project is located.

17.06 Headings

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

SUPPLEMENTARY CONDITIONS

The Standard General Conditions of the Construction Contract and other provisions of the Contract Documents are amended or supplemented by these Supplementary Conditions as indicated below. All provisions of the Standard General Conditions, which are not so amended or supplemented, remain in full force and effect. The terms used in these Supplementary Conditions which are defined in the Standard General Conditions of the Construction Contract have the meanings assigned to them in the General Conditions.

S.C.-2.02.A.

Delete paragraph 2.02 of the General Conditions in its entirety and insert the following in its place:

A. OWNER shall furnish to CONTRACTOR up to six copies of the Contract Documents as are reasonably necessary for the execution of the Work. Additional copies will be furnished, upon request, at the cost of reproduction.

S.C.-3.01.C.

Add the following new paragraph immediately after paragraph 3.01.C. of the General Conditions, which is to read as follows:

D. The Drawings are intended to conform and agree with the Specifications; if, however discrepancies occur, the ENGINEER will decide which shall govern. Special specifications stated on the Drawings govern that particular piece of Work and have equal weight and importance as the printed specifications. In the event of any discrepancies between the Drawings and the figures written thereon, the figures are to be taken as correct.

S.C.-4.05.A.

Add the following new paragraphs immediately after paragraph 4.05.A. of the General Conditions, which is to read as follows:

B. It will be the CONTRACTOR'S responsibility to flag, protect, or provide offset references for the remonumentation of any property corners or rights-of-way markers that are disturbed by the Work on the Project. In the even these markers are damaged or removed, it

will be the CONTRACTOR'S responsibility to re-establish those markers that were present prior to Work on the project.

C. It shall be the CONTRACTOR'S responsibility to verify all reference points shown on the Contract Documents prior to beginning Work on the site. This verification shall be conducted by professionally qualified personnel in a manner that will verify the accuracy of the information shown in the Contract Documents. On projects that involve the connection to, or additions to existing structures, the elevations of existing structures shall also be verified. Any finding that differs from information shown on the Contract Documents shall be submitted to the ENGINEER for resolution.

D. Additional surveys necessary for the construction staking shall be performed by the CONTRACTOR, the cost of which shall be incorporated into the appropriate items of Work. On projects in which payment is classified by depth of cut, the construction staking shall be performed in a manner that will allow for the determination of cut classification if the classification is to be other than what is shown in the Contract Documents. During construction of the project, the CONTRACTOR shall keep a daily log and record of the location of all underground pipes, all structures, and any deviation from the plans. The CONTRACTOR shall keep and furnish this daily log and record in a manner that will allow the ENGINEER to incorporate these items into the Contract Documents.

S.C.-5.01.A.

In paragraph 5.01.A. of the General Conditions, delete the phrase “becomes due” and replace it with “is made by the OWNER”.

S.C.-5.01.B.

Delete paragraph 5.01.B. of the General Conditions in its entirety and insert the following in its place:

B. All Bonds shall be in the form prescribed by the Contract Documents. The surety shall hold a current certificate of authority to transact business in Georgia from the Georgia Insurance Commissioner, or in lieu thereof the OWNER may require that the surety be named on the current list of “Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies” as published in Circular 570 by the U.S. Treasury Department. All Bonds signed by an agent must be accompanied by a certified copy of such agent’s authorization to act for the surety.

S.C.-5.01.C

In paragraph 5.01.C. of the General Conditions, delete the number “20” and replace it with “10”. Also add the following new sentences to the end of the paragraph:

The OWNER may stop all work on the project until the new or additional bonds are furnished. If the bonds are not provided within the ten-day period, the OWNER may terminate the contract. Additionally, the OWNER may complete the project as the agent of, and at the expense of, the CONTRACTOR and his or her sureties in accordance with O.C.G.A. 36-91-40(b).

S.C.-5.04.B.6.

Add the following new paragraph immediately after paragraph 5.04.B.6. of the General Conditions, which is to read as follows:

C. The limits of liability for the insurance required by paragraph 5.04 of the General Conditions shall provide coverage for not less

than the following amounts or greater where required by Laws and Regulations:

1. Worker’s Compensation and related coverages under paragraphs 5.04.A.1 and A.2. of the General Conditions:
 - a. State: Statutory Limit
 - b. Federal: Statutory Limit
 - c. Employer’s Liability:.....\$1,000,000
2. Contractor’s general Liability under paragraphs 5.04.A.3 through A.6 of the General Conditions which shall include completed operations and product liability coverages and eliminate the exclusion with respect to property under the care, custody and control of Contractor:
 - a. General Aggregate:..... \$2,000,000
 - b. Products – Completed Operation Aggregate: \$2,000,000
 - c. Personal & Advertising Injury: \$1,000,000
 - d. Each Occurrence (Bodily Injury and Property Damage)..... \$1,000,000
 - e. Property Damage liability insurance will provide Explosion, Collapse, and Underground coverages where applicable.
3. Automobile Liability under paragraph 5.04.A.6 of the General Conditions:
 - a. Bodily Injury:
 - 1) Each Person: \$1,000,000
 - 2) Each Accident: \$1,000,000
 - b. Property Damage
 - 1) Each Accident: \$1,000,000
 - OR
 - c. Combined Single Limit of:.... \$2,000,000

S.C.-6.02.B.

Add the following new paragraph immediately after paragraph 6.02.B. of the General Conditions, which is to read as follows:

C. Regular working hours for this project are Monday through Friday between the times of 7:00 A.M. and 6:00 P.M. Approval for work outside of regular working hours requires City Council approval, and work performed beyond

regular working hours shall be done at no additional cost to OWNER. CONTRACTOR shall reimburse OWNER for all extra costs associated with such work including additional support services, engineering services, inspection services, testing services, utilities or other applicable costs. The ENGINEER will determine the extent of additional services needed due to CONTRACTOR'S working outside regular work hours.

S.C.-6.06.B.

B. If the Bid or Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other persons or organizations (including those who are to furnish the principal items of materials or equipment) to be submitted to OWNER in advance of the specified date prior to the Effective Date of the Agreement for acceptance by OWNER and ENGINEER, and if CONTRACTOR has submitted a list thereof in accordance with the Bid or Supplementary Conditions, OWNER'S or ENGINEER'S acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other person or organization so identified may be revoked on the basis of reasonable objection after due investigation, in which case CONTRACTOR shall submit an acceptable substitute at no charge in Contract Price. No acceptance by OWNER or ENGINEER of any such Subcontractor, Supplier or other person or organization shall constitute a waiver of any right of OWNER or ENGINEER to reject defective work.

S.C.-6.06.G.

Add the following new paragraph immediately after paragraph 6.06.G. of the General Conditions, which is to read as follows:

H. If more than twenty-five percent of the work (as measured by dollar value and not including specialty work that is customarily

subcontracted) is to be performed by one or more subcontractors then CONTRACTOR is obligated to notify OWNER in writing of this intent with the submission of the Bid and to provide such supplemental information within five days of the bid as outlined herein under Section 11 of INSTRUCTIONS TO BIDDERS.

S.C.-6.10.A.

Add the following new paragraph immediately after paragraph 6.10.A. of the General Conditions, which is to read as follows:

B. When applicable, the CONTRACTOR shall provide a written tabulation, plus other documentation as may be required, of all taxes, including sales tax, paid by the CONTRACTOR. This is to assist the OWNER in obtaining sales and/or use tax refunds for eligible machinery and equipment used for the primary purpose of reducing or eliminating air or water pollution as provided for in Chapter 48-8-3 (36) and (37) of the Official Code of Georgia. Such written tabulation shall be included with each partial payment request. Any refunds will accrue to the OWNER.

S.C.-6.13.B

Add the following new paragraph immediately after paragraph 6.13.B. of the General Conditions, which is to read as follows:

C. All property affected by work on the project shall be replaced or restored to a condition as good as when the CONTRACTOR entered upon the Work. In case of failure on the part of the CONTRACTOR to restore such property, or make good such damages or injury, the OWNER may, after 48 hours written notice, or sooner in the case of an emergency, proceed to repair, rebuild, or otherwise restore such property, improvements or facilities as may be deemed necessary. The cost thereof will be deducted from any monies due or which may become due the CONTRACTOR under this Contract.

S.C.-6.17.D.3.

Add the following new paragraph immediately after paragraph 6.17.D.3. of the General Conditions, which is to read as follows:

4. If more than two reviews of the same submittal are required of the ENGINEER or other representative of the OWNER due to unverified, incomplete, inaccurate, erroneous or nonconforming Submittals, then the CONTRACTOR shall be responsible for the reimbursement of the ENGINEER, the OWNER or his representative for the cost of said reviews. The occurrence of such submittals shall be deemed a failure to comply with General Conditions paragraphs 6.01.A and 6.06.A.

S.C.-7.02

Delete paragraph 7.02 of the General Conditions in its entirety and insert the following in its place:

7.02 Coordination

A. If OWNER contracts with others for the performance of other work on the Project site, the CONTRACTOR shall attend and participate in coordination meetings with the other on-site Contractors.

B. Should CONTRACTOR cause damage to the work or property of any separate of contractor at the site, or should any claim arising out of or resulting from CONTRACTOR'S performance of the Work at the site be made by any separate contractor against CONTRACTOR, OWNER, ENGINEER or ENGINEER'S Consultants or any other person, CONTRACTOR shall promptly attempt to settle with such other contractor by agreement, or to otherwise resolve the dispute by mediation, arbitration, or at the law. CONTRACTOR shall, to the fullest extent permitted by Laws and Regulations, indemnify and hold OWNER, ENGINEER and ENGINEER's Consultants and the officers, directors, employees, agents, and other consultants of each and any of them harmless from and against all claims, costs,

losses and damages, (including, but not limited to, all fees and charges of engineers, architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs) arising directly, indirectly or consequentially out of or resulting from any action, legal or equitable, brought by a separate contractor against OWNER, ENGINEER, or ENGINEER'S Consultants or the officers, directors, employees, agents, or other consultants of each and any of them to the extent based on a claim caused by, arising out of, or resulting from CONTRACTOR'S performance of Work. Should a separate contractor cause damage to the Work or property of CONTRACTOR or should the performance of work by any separate contractor at the site give rise to any other claim, CONTRACTOR shall not institute any action, legal or equitable, against OWNER, ENGINEER, or ENGINEER'S Consultants or the officers, directors, employees, agents, or other consultants of each and any of them or permit any action against any of them to be maintained and continued in its name for its benefit in any court or before any mediator or arbitrator which seeks to impose liability on or to recover damages from OWNER, ENGINEER, or ENGINEER'S Consultants or the officers, directors, employees, agents, or other consultants of each and any of them on account of any such damage or claim. If CONTRACTOR is delayed at any time in performing or furnishing Work by any act or neglect of a separate contractor and OWNER and CONTRACTOR are unable to agree as to the extent of any adjustment in Contract Times attributable thereto, CONTRACTOR may make a claim for an extension of time in accordance with Article 12. An extension of the Contract Times shall be CONTRACTOR'S exclusive remedy with respect to OWNER, ENGINEER, or ENGINEER'S Consultants or the officers, directors, employees, agents, or other consultants of each and any of them for any delay, disruption, interference or hindrance caused by

any separate contractor. This paragraph does not prevent recovery from OWNER, ENGINEER, or ENGINEER'S Consultants or the officers, directors, employees, agent, or other consultants of each and any of them for activities that are their respective responsibilities.

S.C.-8.02.A.

In paragraph 8.02.A. of the General Conditions, delete the phrase "...to whom CONTRACTOR makes no reasonable objection,..."

S.C.-9.03.A.

Add the following new paragraph immediately after paragraph 9.03.A. of the General Conditions, which is to read as follows:

B. The Resident Project Representative will be authorized to review the Work and products furnished, but the Resident Project Representatives will not be authorized to alter or waive any requirements of the Contract Documents.

S.C.-9.10.A.

Add the following supplement to paragraph 9.10.A. in the General Conditions, which is to read as follows:

CONTRACTORS, Subcontractors, Suppliers and others on the Project, or their sureties, shall maintain no direct action against the ENGINEER or other representatives of the OWNER for any claim arising out of, in connection with, or resulting from the engineering or other services performed for OWNER. Only the OWNER will be the beneficiary of any undertaking by the ENGINEER or other representatives of the OWNER.

S.C.-11.01.A.1.

In paragraph 11.01.A.1 of the General Conditions, delete the word "bonuses."

S.C.-12.01.C.2.f.

Add the following new paragraph immediately after the paragraph 12.01.C.2.f. of the General Conditions, which is to read as follows:

g. Except the total aggregate fees paid the CONTRACTOR and all lower tiered Subcontractors shall not exceed 26.8 percent of the cost of the work.

S.C.-12.02.B.

Add the following new paragraph immediately after paragraph 12.02.B. of the General Conditions, which is to read as follows:

C. The CONTRACTOR shall proceed with the Work at a rate of progress, which will insure completion within the Contract Time. It is expressly understood and agreed by and between the CONTRACTOR and the OWNER that the Contract Time of the Work described herein is a reasonable time, taking into consideration the average climatic and economic conditions, and other factors prevailing in the locality of the Work. If the CONTRACTOR shall fail to perform the Work required within the Contract Time, or extended Contract Time if authorized by Change order, then the CONTRACTOR shall pay to the OWNER the full amount of liquidated damages specified in the Contract Documents for each calendar day that the CONTRACTOR shall be in default after the time stipulated in the Contract Documents.

S.C.-12.03.A.

In paragraph 12.03.A. of the General Conditions, delete the phrase "...fires, floods, epidemics, abnormal weather conditions or acts of God." and replace it with "...fires, floods, quarantine restrictions, strikes, freight embargoes, epidemics, abnormal and unforeseeable weather conditions of acts of God."

S.C.-14.02.C.

Delete paragraph 14.02.C. of the General Conditions in its entirety and insert the following in its place:

C. Prompt Payment Clause

1. Owner and Contractor agree that all partial payments and final payments shall be subject to the Georgia Prompt Pay Act, as originally enacted and amended, and as set forth in O.C.G.A. 13-11-1 through 13-11-11, except as provided below to the extent authorized by law:

2. Interest Rate: For purposes of computing interest on late payments, the rate of interest shall be one-half percent per month or a pro-rata fraction thereof on the unpaid balance as may be due.

3. Payment Periods:

a) When the Contractor has performed in accordance with the provisions of these Contract Documents, the Owner shall pay the Contractor within 45 days of receipt by the Owner or the Owner's representative of any properly completed Application for Payment, based upon work completed or service provided pursuant to the terms of these Contract Documents.

4. When a subcontractor has performed in accordance with the provisions of its subcontract and the subcontract conditions precedent to payment have been satisfied, the Contractor shall pay to that subcontractor and each subcontractor shall pay to its subcontractor, within ten days of receipt by the Contractor or subcontractor of each periodic or final payment, the full amount received for such subcontractors work and materials based on work completed or service provided under the subcontract, less retainage expressed as a percentage, but such retainage shall not exceed that retainage being held by the Owner, provided that the subcontractor has provided or provides such satisfactory reasonable assurances of continued performance and financial responsibility to

complete its work as the Contractor in its reasonable discretion may require, including but not limited to a payment and performance bond.

5. Interest on Late Payment: Except otherwise provided in these Contract Documents and/or in O.C.G.A. 13-11-5, if a periodic or final payment to the Contractor is delayed by more than the time allotted in Paragraph b. of this Prompt Payment Clause or if a periodic or final payment to a subcontractor is delayed more than ten days after receipt of periodic or final payment by the Contractor or subcontractor, the Owner, Contractor, or subcontractor, as the case may be, shall pay interest to its Contractor, or subcontractor beginning on the day following the due dates as provided in Paragraph b. of this Prompt Payment Clause at the rate of interest as provided herein. Interest shall be computed per month or a pro-rata fraction thereof on the unpaid balance. There shall be no compounded interest. No interest is due unless the person or entity being charged interest received "Notice" as provided in Paragraph d. of this Prompt Payment Clause. Acceptance of progress payments or final payment shall release all claims for interest on said payments.

6. Notice of Late Payment and Request of Interest: Any person or entity asserting entitlement to interest on any periodic or final payment pursuant to the provisions of this Prompt Payment Clause shall provide "notice" to the person or entity being charged interest of the charging party's claim to interest on late payment. "Notice" shall be in writing, served by U.S. Certified Mail – Return Receipt Requested at the time the properly completed Application for Payment is received by the Owner or Owner's

representative, and shall set forth the following:

- a) A short and concise statement that interest is due pursuant to the provisions of the Georgia Prompt Pay Act and this Prompt Payment Clause;
- b) The principal amount of the periodic or final payment which is allegedly due to the charging party; and
- c) The first day and date upon which the charging party alleges that said interest will begin to accrue, pursuant to the provisions of the Georgia Prompt Pay Act and this Prompt Payment Clause.

D. These "Notice" provisions are of the essence; therefore, failure to comply with any requirement as set forth in the Prompt Payment Clause precludes the right to interest on any alleged late payment to which said "Notice" would otherwise apply.

1. Integration with the Georgia Prompt Pay Act: Unless otherwise provided in these Contract Documents, the parties hereto agree that these provisions of this Prompt Payment Clause supersede and control all provisions of the Georgia Prompt Pay Act (O.C.G.A. 13-11-1 through 13-11-11 (1994)), as originally enacted and as amended, and that any dispute arising between the parties hereto as to whether or not the provisions of this contract or the Georgia Prompt Pay Act control will be resolved in favor of these Contract Documents and its terms.

S.C.-14.02.D.1.c.

Delete paragraph 14.02.D.1.c. of the General Conditions in its entirety and insert the following in its place:

c. items entitling OWNER to retain set-offs from the amount recommended to cover accrued

charges against CONTRACTOR for Liquid Damages or compensation to ENGINEER or other representatives of OWNER that are chargeable to CONTRACTOR in accordance with the Contract Documents.

S.C.-14.06.A.

14.06 Final Review of Construction

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

S.C.-14.07.C.

In paragraph 14.07.C. of the General Conditions, delete the phrase "Thirty days..." and replace it with "Forty-five days..."

S.C.-14.09.A.2.

Delete paragraph 14.09.A.2. of the General Conditions in its entirety and insert the following in its place:

2. A waiver of all claims by CONTRACTOR against OWNER.

S.C.-15.02.A.4.

Add the following new paragraphs immediately after paragraph 15.02.A.4. of the General Conditions, which is to read as follows:

5. The CONTRACTOR is adjudged bankrupt or insolvent;

6. The CONTRACTOR makes a general assignment for the benefit of creditors;

7. A trustee or receiver is appointed for the CONTRACTOR of for any of CONTRACTOR'S property;

8. The CONTRACTOR files a petition to take advantage of any debtor's act, or to reorganize under the bankruptcy or applicable laws;

9. The CONTRACTOR repeatedly fails to make prompt payments to Subcontractors or Material Suppliers for labor, materials or equipment;

S.C.-17.01.A.

Add the following new paragraph immediately after paragraph 17.01.A. in the General Conditions, which is to read as follows:

B. The CONTRACTOR shall file all "Notices of Commencement" required for this Project in accordance with O.C.G.A. §44-14-361.5 et.seq. and §36-82-104 et.seq., as applicable. The CONTRACTOR shall respond to all requests for copies of a Notice of Commencement. Should the OWNER or ENGINEER receive such a request, this request will be forwarded to the CONTRACTOR for further handling. The name and general description of the Project shall be as stated in the Invitation to Bid.

END OF SECTION

SECTION 01012

MOBILIZATION AND DEMOBILIZATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Mobilization and Demobilization

1.02 MEASUREMENT AND PAYMENT

- A. All work performed as part of mobilization and demobilization will be measured as a lump sum when mobilization and demobilization is listed as a separate bid item.
- B. When mobilization and demobilization is listed in the Bid Proposal as a separate bid item, partial payments will be made on the following basis:
 - 1. Mobilization shall be limited to 1.00% of the total bid amount up to a maximum of \$10,000.00.
 - 2. Mobilization shall constitute 70 percent of the total lump sum bid for mobilization and demobilization. Partial payments will be made in two equal or approximately equal payments.
 - a. The first payment will be made on the first pay estimate as long as work performed to date on other Contract pay items exceeds \$1,000.00.
 - b. The second payment will be made on the first pay estimate after the Contractor has earned five (5) percent or more of the total Contract amount for other items. Both payments will be made simultaneously when requirements a. and b. are met at the same time.
 - 3. Demobilization shall constitute 30 percent of the total lump sum bid for mobilization and demobilization. Payment for demobilization may be authorized after final acceptance of the project.
- C. When mobilization and demobilization is not listed in the Proposal as a separate bid item, then all costs associated with mobilization and demobilization will be considered incidental to the Contract, and no separate payment will be made.

****END OF SECTION****

SECTION 01050

FIELD ENGINEERING BY CONTRACTOR

PART 1 - GENERAL

1.1 GENERAL

- 1.1.1 The Contractor shall: Provide, at no additional cost to the owner, field engineering services required for the Project.
 - 1.1.1.1 Survey work required in execution of the Project.
 - 1.1.1.2 Civil, structural or other professional engineering services specified, or required to execute Contractor's construction methods.
- 1.1.2 Prior to construction or sitework, the Engineer will identify existing control points indicated on the drawings, as needed.

PART 2 - PRODUCT

2.1 SURVEY REFERENCE POINTS

- 2.1.1 Existing basic horizontal and vertical control points for the project are those designated on drawings.
- 2.1.2 The Contractor shall locate and protect control points prior to starting any clearing, grubbing or construction, and preserve all permanent reference points during construction. The Contractor shall provide, at his expense, any temporary staking, including necessary off-set staking to preserve the control points.
 - 2.1.2.1 The Contractor shall make no changes or relocation without prior written notice to Engineer.
 - 2.1.2.2 The Contractor shall report to Engineer when any reference point is lost or destroyed, or requires relocation due to changes in the scope of the project.
 - 2.1.2.3 The Contractor shall require a surveyor to replace project control points which may be lost or destroyed. Establish replacements based on original survey control.

2.2 PROJECT SURVEY REQUIREMENTS

2.2.1 Establish lines and levels, locate and lay out, by instrumentation and similar appropriate means:

2.2.2 Construction Staking

2.2.2.1 Stakes for grading, fill and topsoil placement

2.2.2.2 Stakes for pipeline alignment and manhole locations

2.2.2.3 Pipeline elevations and invert elevations.

2.2.2.4 From time to time, verify layouts by the same methods.

2.2.3 Topographic Layout

Prior to any construction adjacent to a wetland area, existing ground shall be surveyed and existing ground elevations and gradients shall be recorded. Such information shall be submitted to the Engineer prior to construction near the wetland area. Such information shall be submitted to the Engineer.

2.2.4 Roadway and Driveway Restoration

Prior to the installation of the sanitary sewer across any roadway or driveway by open cut, boring or tunneling, the profile of the roadway or driveway and the cross-sections to be disturbed by construction shall be surveyed. This information shall be submitted to the Engineer prior to any construction. Upon the completion of the sanitary sewer installation, the profile of any restored roadway or driveway and cross-sections disturbed by construction shall be surveyed. Such information shall be submitted to the Engineer.

2.2.5 Record Drawing Surveying

2.2.5.1 Establish necessary control points and provide necessary equipment to accurately record the location of the sanitary sewer system and water main as constructed.

2.2.5.2 Record the location of force main and water main at every fitting and bend.

2.2.5.3 Vertical locations shall be shown referenced to Mean Sea Level. Reference all horizontal locations to the NAD83 datum (latest adjustment) and reference all vertical locations to the NAVD88 datum.

PART 3 - EXECUTION

3.1 RECORDS

Maintain a complete, accurate log of all control and as-built survey work as it progresses.

3.2 SUBMITTALS

3.2.1 On request of the Engineer, submit documentation to verify accuracy of field engineering work.

3.2.2 Upon the submittal of the final pay request and prior to final payment, provide an ASCII text file with the record locations of the new sanitary sewer system in accordance with the City of Canton Sanitary Sewer Standards, including at a minimum the following information:

3.2.2.1 Station

3.2.2.2 Northing

3.2.2.3 Easting

3.2.2.4 Elevation (top of fitting on force main, ground elevation, top of pipe elevation, top of manhole, invert elevation (in and out),

3.2.2.5 Description of point (Point ID, fitting description, manhole number,

3.2.2.6 For the gravity sewer line, this data (northing, easting, elevation, station) shall be collected and submitted to the Engineer for every manhole, including the Manhole ID, the Manhole Lid Elevation, the Invert elevations, and the description of the each pipe entering and leaving the manhole (Diameter, Material, Invert, Type (i.e., force main, service, sewer main, etc.)

3.2.2.7 For the force main, this data (northing, easting, elevation, station), shall be collected and submitted to the Engineer for the entire length of the force main. The force main shall be located at 50 foot intervals (finished ground and top of pipe). All sudden changes in elevation shall also be located and recorded. All fittings and air release valves shall also be located and recorded. The size and material of the force main shall also be recorded.

Along with submittal of electronic text file, Contractor shall submit a red-line copy of a set of construction plans detailing all aspects of the construction that differ from the original construction plans.

****END OF SECTION****

SECTION 01060

REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.1 GENERAL

The Contractor shall, without additional expense to the Owner, be responsible for obtaining any necessary licenses, permits and complying with any and all applicable Federal, State and Municipal laws, codes and regulations in connection with the prosecution of the work included in this contract.

1.2 SAFETY AND HEALTH

The Contractor shall take proper safety and health precautions to protect the Work, the workers, the public, and the property of others.

1.3 NPDES Permit

If the disturbed area exceeds 1.0 acre or if the disturbed area is within 200 feet of a state water, the Contractor shall be required to comply with the EPD's General Permit GAR100002 as the primary permittee. **THIS PROJECT IS EXPECTED TO DISTURB MORE THAN 1.0 ACRE AND IS ALSO WITHIN 200 FEET OF A STATE WATER.** Therefore the Contractor will be required to comply with the EPD's General Permit GAR100002 as the primary permittee. Please note the requirements set forth in the plan set and in the permit documents. The latest permit is available on the Georgia EPD Website.

1.4 DEFINITIONS:

Design Professional: The term Design Professional shall mean a professional licensed by the State of Georgia in the field of: engineering, architecture, landscape architecture, forestry, geology, or land surveying and is a Certified Professional in Erosion and Sediment Control.

PART 2 – PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

The Contractor as a minimum shall perform the following duties:

- A. Maintain the erosion and sediment control on the project site in accordance with the approved plans.
- B. Install and maintain the erosion and sedimentation control devices and practice best management practices to comply with the requirements and intent of the Erosion, Sedimentation and Pollution Control Plan.
- C. Comply with all federal, state and local regulations regarding erosion and sediment control.
- D. Comply with all requirements of the EPD's NPDES Permit No. GAR 100002.
- E. Comply with all requirements of the City of Canton regarding work inside and adjacent to the right of way of any roadways on this project.
- F. Comply with all easement stipulations.

****END OF SECTION****

SECTION 01150

MEASUREMENT AND PAYMENT

1. GENERAL

No quantities shall be measured for payment except items listed in the proposal, unless the Owner has approved "extra" work, in writing, in accordance with the contract documents and has so advised the Contractor before the work was actually performed.

Any and all other materials, labor, etc., furnished and required shall be considered as incidental to the items to be measured for payment.

The unit or lump sum prices bid for the various items shall be full compensation for furnishing all materials, tools, equipment, labor and incidentals necessary and/or required to complete the work as shown on the plans and called for in the specifications.

The quantities to be paid for shall be determined by actual measurement or count of the amount placed. The Engineer shall make all measurements and the Contractor shall make certain all work has been measured before concealing; otherwise, he may be required to uncover or make accessible any work so concealed in order to receive payment for such items.

2. FORCE MAIN

All force main shall be measured horizontally and payment shall be made at the unit price bid per linear foot. Unit price bid for force main shall include any and all clearing and grubbing of right-of-way required for the construction, property restoration and other work that is not designated as a pay item. Price shall also include polyethylene encasement.

3. FORCE MAIN TESTING

No separate payment will be made for required pressure testing of the force main. Contractor's cost for testing shall be included in the bid price of the force main pipe.

4. STEEL CASINGS

Payment for this item shall be made at the unit price bid per linear foot and shall include furnishing all incidentals and extra labor required to complete installation of the force main and/or sewer in the steel pipe. Unit price bid shall also include payment for furnishing and installing grout in the annular space between the force main and the steel pipe. Unit price bid shall also include full compensation for all tools, labor, and materials necessary to seal up the steel pipe after installation of force main pipe. Where solid rock is encountered in the bore and verified by the Owner's representative, the additional fee

per linear foot in item 3 of the bid form shall be paid to the Contractor for the length of casing installed through the solid rock.

5. POLYETHYLENE CASING FOR FORCE MAIN AND WATER MAINS

All ductile iron force main pipe shall be encased in polyethylene tubing. Payment for this tubing shall be included in the unit price bid per linear foot for the force main.

6. STANDARD MANHOLES

Manholes will be counted in place. Each manhole will be measured from the invert of the lowest pipe at the centerline to the top of the brickwork. Price of the manhole shall include cast iron ring, cover and steps.

Payment will be made at the unit price bid per each for manholes having a depth of six feet or less, measured from the invert of the lowest pipe to the top of the brickwork, and the unit price bid shall include the manhole ring, cover, boots, steps and water proof manhole casting and cover if required. It shall also include the cost of vents where shown. When the depth of manholes exceeds six feet, the difference between the actual depth and six feet will be paid for at the unit price bid per vertical foot for extra depth for manholes.

7. WATER PROOF MANHOLE VENTS

Waterproof manhole vents shall be counted in place. Payment will be made as a part of the unit price bid for manholes.

8. WATERTIGHT FRAME & COVERS

Watertight frame & covers payment will be made as a part of the unit price bid for manholes.

9. SEWER PIPE

All sewer lines will be measured horizontally from center to center of manholes, and cut determined by the difference in elevation from the ground surface of the center line of the ditch to the invert grade of sewer.

Payment will be made at the unit price bid per foot for each size, cut classification and type of pipe as included in the proposal and as shown on the plans and in the specifications.

Unit price bid for sewer pipe shall include any and all clearing and grubbing of right-of-way required for the construction of sewer lines, property restoration and other work that is not designated as a pay item.

The unit price per linear foot of pipe shall also include stabilizer stone used for Class "C" bedding. The unit price shall also include Class "B" bedding, where shown, and installation of stone to 2/3 of the pipe diameter where P.V.C. pipe is used. If poor soil conditions require using stabilizer stone in excess of these minimum requirements, then the stone will be paid for extra at the bid price for stabilizer stone.

10. CONNECTING TO EXISTING SEWER OR MANHOLE

The price bid for connection to existing manholes shall include and shall be full compensation for all labor, materials, tools, equipment, and incidentals necessary to complete the connection as shown on the contract drawings, including drop manholes and extra depths of the same. Payment shall be made on a per each basis at the unit price bid for that type and size connection. All tools, materials, equipment, labor and other incidentals necessary to core and connect to the existing manhole, rework the manhole invert and plug any existing sewer mains to be abandoned shall be included in the unit price bid. No payment shall be made under any other item for work necessary to make connections to existing manholes, except under the category of subgrade stabilizer which shall be paid for separately at the unit price bid. Connection shall be completed in accordance with City of Canton Sanitary Sewer Standards.

11. SOLID ROCK EXCAVATION

The quantity of rock excavation to be paid for shall be the average actual length times the average actual depth, times a width equal to the nominal diameter of the pipe plus 24 inches. Solid rock excavation will be paid for at the unit price bid per cubic yard.

12. ADDITIONAL SUBGRADE STABILIZER

Subgrade stabilizer stone will be paid for at the unit price bid per ton. Stone that is used for Class "C" bedding will not be paid for as subgrade stabilizer, nor will it be paid for where Class "B" is shown on the plans. It will be paid for where job conditions require stabilizer stone beyond the minimum bedding requirements shown on the plans only where extra stone is approved in writing by the Engineer. Where stabilizer stone is eligible for payment the quantity (tonnage) will be taken from delivery tickets, if these are identified separately from non-legible stone; otherwise, the quantity will be computed by measuring the volume placed and applying a weight of 120 pounds per cubic foot. If a discrepancy exists the computed quantities shall govern.

13. MISCELLANEOUS CONCRETE

Miscellaneous concrete for thrust blocking of the force main and other uses shall be measured in place. Payment under this item at the unit price bid per cubic yard shall cover all costs of furnishing and placing miscellaneous concrete.

14. PIPE FOR SERVICE LINE

The actual length of service lines for sanitary sewer that is installed and accepted will be measured in place and paid for at the unit price bid per linear foot.

15. SERVICE CLEANOUTS

Cleanouts shall be paid for at the unit price bid for each constructed and accepted. The unit price bid for each shall include all materials, labor, equipment, tools and other incidentals required to complete installation as shown on the detailed drawings.

16. TEMPORARY SILT FENCE “Sd1” – DOUBLE ROW OF TYPE C

Double Row of Type C Silt fence shall be measured in place and paid for at the unit price bid per linear foot for 2 side by side silt fences. Payment shall be full compensation for all materials and labor necessary to install, maintain and eventually remove and properly dispose of silt fencing as indicated on the plans or called for in the specifications. Silt fence must be installed in accordance with the Manual for Erosion Control in Georgia in order to be eligible for payment. Silt fence that is not properly trenched in will not be paid for. Silt fence materials that are not in accord with the Manual for Erosion Control in Georgia will not be paid for.

17. TEMPORARY SILT FENCE “Sd1” – SINGLE ROW OF TYPE C

Single Row of Type C Silt fence shall be measured in place and paid for at the unit price bid per linear foot for one row of silt fence. Payment shall be full compensation for all materials and labor necessary to install, maintain and eventually remove and properly dispose of silt fencing as indicated on the plans or called for in the specifications. Silt fence must be installed in accordance with the Manual for Erosion Control in Georgia in order to be eligible for payment. Silt fence that is not properly trenched in will not be paid for. Silt fence materials that are not in accord with the Manual for Erosion Control in Georgia will not be paid for.

18. CONSTRUCTION EXIT “Co”

Temporary construction exits that are installed and accepted in accordance with the Manual for Erosion Control in Georgia will be counted in place and paid for at the unit price bid per each. Payment shall be full compensation for all labor, materials, geotextile underlayment, stone and miscellaneous items necessary for construction of the construction exit as indicated on the plans. No additional payment will be made for maintenance or removal of the exit.

19. EROSION CONTROL MATTING “Mb”

Erosion control matting shall be paid for on a square yard basis for matting actually placed and maintained. The unit price shall be full compensation for all labor, tools, equipment, and materials necessary to put matting in place.

20. CHECK DAMS “Cd”

Check dams shall be paid for on a per unit basis for each. The unit price shall be full compensation for all labor, tools, equipment, and materials necessary to put the check dams in place in accordance with the Manual for Erosion Control in Georgia.

21. STORM DRAIN OUTLET PROTECTION “ST”

Storm drain outlet protection shall be paid for on a per unit basis for each. The unit price shall be full compensation for all labor, tools, equipment, and materials necessary to put the storm drain outlet protection in place.

22. INLET SEDIMENT TRAP “Sd2”

Inlet sediment traps shall be paid for on a per unit basis for each. The unit price shall be full compensation for all labor, tools, equipment, and materials necessary to put the inlet sediment trap in place.

23. FILL DIRT

No payment shall be made for any fill dirt shown on the plans.

24. MISCELLANEOUS IRON FITTINGS AND SPECIALS

Miscellaneous ductile iron fittings and specials will be counted in place. A list of the fittings installed including their weights shall accompany each pay request.

Payment for mechanical joint fittings will be made at the unit price bid per pound for iron specials and fittings and will be made on an individual basis for each iron fitting installed. Weight of iron fittings will be calculated at the AWWA C110 weight for 350 PSI mechanical joint fittings not including weight of joint accessories, and this payment will cover the cost of joint accessories.

25. RESTRAINED JOINTS

No extra payment shall be made for restrained joints. The price should be included in the pipe bid price.

26. LOCATOR TAPE

No separate payment will be made for locator tape. The cost of installing this item shall be included in the contractor's bid price for the installation of PVC service line.

27. WYES AND BENDS

Wyes and bends that are installed and accepted will be counted in place by size and type. Payment for wyes and bends will be made at the unit price bid per each of the various sizes and types of wyes and bends.

28. ASPHALT TOPPING TYPE "F" (For Asphalt Resurfacing of Streets)

If directed by the Owner, the Contractor will pave the designated portion of street with 1-1/2" type "F" topping. Asphalt topping type "F" will be paid for at the unit price bid per square yard of the material actually placed and accepted.

29. CONCRETE BASE FOR TRENCHES (For Asphalt Resurfacing of Streets)

Before asphalt topping is placed a layer of concrete shall be placed in compacted trench as shown in the details. The base shall be finished flush with existing pavement. Payment will be on a linear foot basis as measured along the pipe centerline.

30. EXFILTRATION AND INFILTRATION TESTING

Payment for this item should be included in the bid price of the pipe.

31. GRASSING (All Types)

The area to be seeded will be measured when a satisfactory solid stand of grass has been obtained, and the area will be obtained by multiplying the length times the width. Grassing will be paid for at the unit price bid per square yard. Grassing shall conform to the requirements of the Manual for Erosion Control in Georgia.

Special grassing (sod) will be replaced as sod and will be paid for under the unit price bid per square yard for sod. Sod placed without the direction of the Engineer or Owner shall be paid for as seeded grassing.

Before seeding or sodding is placed, the Contractor shall consult with the Engineer to determine which form of grassing shall be utilized.

32. TEMPORARY STRAW MULCH STABILIZATION (Ds1)

Straw mulch stabilization placed for temporary purposes in areas where the Contractor needs to return after a short absence (such as a weekend) shall be paid for at the unit price bid per square yard. The Engineer's field representative must approve the use of this item prior to its installation to be eligible for payment. Mulch placed such that the soil is still visible shall not be measured or eligible for payment.

33. LANDSCAPING

The lump sum price bid for landscaping is for landscaping removed and replaced that is not covered by other proposal items. The price shall include, but not limited to all labor,

materials, laying and staking, fertilizing, mulching and guaranteeing involved in the installation.

34. REMOVE AND REPLACE FENCE

Fencing payment will be made at the unit price bid per linear foot for the actual number of linear feet of fence removed and replaced.

35. REMOVE AND REPLACE CONCRETE CURB AND GUTTER

Concrete curb and gutter removed and replaced shall be paid for at the unit price bid per linear foot.

36. REMOVE AND REPLACE ASPHALT DRIVEWAY

Asphalt pavement shall be removed, disposed of, and replaced as detailed on the plans. Payment shall be made on a square yard basis. The width used in payment calculations shall be the actual replacement width up to a maximum of nominal pipe diameter plus 48". The unit price bid per square yard for removal and replacement of asphalt pavement shall be full compensation for all labor, materials, tools, and equipment necessary to remove, dispose of, and replace asphalt pavement.

37. REMOVE AND REPLACE CONCRETE DRIVEWAY

Concrete pavement shall be removed, disposed of, and replaced as detailed on the plans. Payment shall be made on a square yard basis. The width used in payment calculations shall be the actual replacement width up to a maximum of nominal pipe diameter plus 48". The unit price bid per square yard for removal and replacement of concrete pavement shall be full compensation for all labor, materials, tools, and equipment necessary to remove, dispose of, and replace concrete or pavement.

38. REMOVE AND REPLACE GRAVEL DRIVEWAY

Gravel driveways shall be removed and restored to a condition equal to or better than that before construction.

Removal and replacement of gravel driveway shall be measured in place and paid for at the unit price bid per square yard. The unit price bid shall be full compensation for removal proper disposal of debris and replacement of gravel driveway to a condition equal to or better than existed before construction.

39. REMOVE AND REPLACE SIDEWALK

Sidewalk removed and replaced will be measured in place and paid for at the unit price bid per linear foot for type of sidewalk removed and replaced.

40. REPLACING RIGHT-OF-WAY MARKERS OR IRON PINS

When existing concrete markers or iron pins are moved during the construction of the sanitary sewer, the Contractor shall replace the iron pin or concrete markers. The iron pin or marker shall be offset and replaced in the same existing location. All concrete markers or iron pins replaced shall be paid at the bid price for each.

41. REMOVE AND REPLACE 6" BRICK WALL

6" brick wall removed and replaced shall be paid at the unit price bid per linear foot for the actual number of linear feet of wall removed and replaced.

42. DUST CONTROL

Dust control efforts completed in accordance with the Manual for Erosion and Sediment Control in Georgia shall be paid for at the lump sum price bid and shall include all materials, equipment, tools and labor necessary to complete the work. Payment for this item shall be included in the final pay request only.

43. REMOVE AND REPLACE HEADWALL

Removing and replacing storm drain headwalls shall be paid for at the unit price bid per each to remove and replace the headwall to the satisfaction of the Engineer and Owner and in accordance with City of Canton standards.

44. TREE PROTECTION FENCING

Payment for tree protection fencing shall be made at the unit price bid per linear foot for the actual number of linear foot of tree save fence installed in accordance with the Georgia Manual for Erosion and Sediment Control. Payment will only be made for the tree protection fence placed at the direction of the field engineer.

45. REMOVE AND REPLACE CONCRETE DITCH

Concrete ditch or flumes removed and replaced shall be paid at the unit price bid per linear foot for the actual number of linear feet of concrete ditch removed and replaced.

46. INSTALLATION OF VERTICAL 2" PVC PIPING FOR GPS DATA COLLECTION

The Contractor shall be paid the unit price bid per each location of 2" PVC piping installed for the purpose of as-built data collection. The Contractor shall be responsible for all materials, labor, equipment and other incidentals necessary to install, label and protect the PVC vertical sections from the time that the force main and water main is installed until the Contractor's Surveyor can make the necessary measurements and cut the pipe off below the ground. If debris clogs the pipe or if the pipe is broken off or lost,

the Contractor will be required to excavate the area down to the main to reinstall the PVC pipe at the Contractor's expense.

47. REMOVE AND REPLACE CULVERT

Storm drains and culverts removed and replaced shall be paid at the unit price bid per linear foot for the actual number of linear feet of storm drains removed and replaced.

48. REMOVE AND REPLACE LIGHT POLE

Light poles removed and replaced shall be paid for at the unit price bid for each.

49. STORM WATER MONITORING - COMPLIANCE WITH EPD NPDES GAR 100002 PERMIT

In accordance with these specifications, the Contractor shall comply with the EPD's NPDES GAR 100002 Permit. The bid proposal has been set up to include all costs of the monitoring, inspecting, required fees, filing of notices, reporting and other requirements of the Permit as required by the contract documents and the NPDES GAR 100002 within the unit prices bid per month for compliance.

50. TURBIDITY BARRIER

Turbidity barriers installed and later removed in accordance with the erosion control plans shall be paid at the unit price bid per linear foot.

51. STREAM BANK STABILIZATION

Stream bank stabilization completed in accordance with the Manual for Erosion and Sediment Control in Georgia shall be paid for at the unit price bid for each.

52. WATER MAINS

Measurement of the pipe in place will be along the main axis of the pipe line, and no deduction in the length of the pipe will be made for space occupied by valves, specials and fittings. In case of branch lines, measurement of said lines will be made from the center line of the main line to the end of the branch line or to the center of the valve or special at the end of the branch line. The unit price bid for pipe shall include all of the materials, labor and incidentals necessary for the completion of the pipeline as called for under these specifications.

Pipe will be paid for at the unit price bid per linear foot for the various sizes and kinds of pipe. The payment for water mains shall include all associated costs for installing the water main at the location and depth shown on the plans. There shall be no additional pay for

extra depth where extra depth is incurred due to valve locations, tie-ins, restrained joint requirements, installation for future road improvements, conflicts with other utilities or storm sewers, or other field conditions.

53. POLYETHYLENE CASING FOR WATER MAINS

All ductile iron water main pipe shall be encased in polyethylene tubing. Payment for this tubing shall be included in the unit price bid per linear foot for the water main.

54. VALVES AND VALVE BOXES

The actual number of valves and valve boxes installed will be counted after they are in place. Valves and valve boxes will be paid for at the unit price bid for valves per each, for each size and type of valve as shown on the plans. The unit price shall include all necessary excavation, setting of the valves and valve boxes, concrete collar around the valve boxes, valve stem extensions, 6" ductile iron pipe from the operating nut to the valve box, and all necessary incidentals to complete the work. Retainer glands for valves shall be paid for separately.

55. VALVE MARKER

Line valve markers, where required, will be counted in place, and will be paid for at the unit price bid per each. For this project, new line valves shall be marked with concrete valve markers and new valves shall also be marked by cutting V's into the curbing adjacent to the valve, with the point of the V pointing towards the valve.

56. CONNECT TO EXISTING WATER MAINS OR VALVES

Connections to existing water mains and valves shall be paid for at the unit price bid per each for the various size connections, including the extra labor involved in locating the existing facilities for the connection. The unit price shall be full compensation for all labor, tools, equipment, and basic appurtenances. Sleeves, fittings, etc. shall be paid for separately as described in the measurement and payment section under the heading "Miscellaneous D.I. Fittings and Specials". This item does not apply to tapping water mains.

This unit price includes plugging the abandoned section of line with fittings. If a "Cut and Plug..." item is done in conjunction with a "Connect to Existing ..." item, the cost of the "Cut and Plug" item shall be included in the price of the "Connect to Existing" item and the Contractor shall only be paid for the one "Connect to Existing .." item. This criteria applies to any cut/plug performed in the same excavation as a "Connect to Existing", since the Contractor is already being paid for the excavation and the cutting of the existing water main in the excavation.

57. MISCELLANEOUS DUCTILE IRON FITTINGS AND SPECIALS

Ductile iron fittings and specials will be counted in place. Payment will be made at the unit

price bid per pound for miscellaneous fittings. Weight of the fittings shall be determined by the AWWA C110 weight for 350 PSI mechanical joint fittings, NOT the manufacturer's listed weight for the brand's version of C110 fittings. Weight used for payment shall not include the weight of joint accessories, and this payment shall cover the cost of joint accessories. A list of the fittings installed including their weights shall accompany each pay request. Retainer glands shall be paid for separately.

58. MISCELLANEOUS CONCRETE FOR BLOCKING AND THRUST COLLARS

The actual quantity of concrete used for blocking pipe and bends and for thrust collars will be measured in place. This item will be paid for at the price bid per cubic yard of concrete for miscellaneous concrete. Any reinforcing steel bars or threaded rod required shall also be included in the payment made per cubic yard for concrete blocking.

59. RETAINER GLANDS

Retainer glands for mechanical joints shall be paid for at the unit price bid per each for each size as listed in the proposal.

60. CUT AND PLUG EXISTING WATER MAINS / SERVICES

The Contractor shall be paid in accordance with his unit price bid per each for cutting and plugging water mains of various sizes. Unit price bid shall be full compensation for labor, tools, equipment and incidentals required to complete the work. Materials used in a "Cut and Plug" item will be paid for separately at the price bid for the type material. Water mains shall be cut and plugged using solid sleeves and DIP plugs or using DIP caps, not concrete.

If two plugs are required in the same excavation (as in the case of plugging both ends of a cut water main), they will be considered as one item. If a "Cut and Plug..." item is done in conjunction with a "Connect to Existing ..." item, the cost of the "Cut and Plug" item shall be included in the price of the "Connect to Existing" item and the Contractor shall only be paid for the one "Connect to Existing .." item. This criteria applies to any cut/plug performed in the same excavation as a "Connect to Existing", since the Contractor is already being paid for the excavation and the cutting of the existing water main in the excavation. "Cut and Plug" items are only payable when one side of the plug will be against a live, pressurized water main at the completion of the project.

61. REMOVE EXISTING WATER VALVE BOX

Removing existing water valve boxes shall be paid for per each valve box removed. Price shall include all materials and labor necessary to complete the work as directed by the Engineer. No payment shall be made for this item if only a portion of the valve box is removed.

62. CONCRETE THRUST COLLARS AND ANCHORS

The concrete used in thrust collars and anchors shall be paid for under miscellaneous concrete. The retainer glands used shall be paid for under retainer glands.

63. RECONNECT EXISTING WATER METER

Reconnection of existing water meters shall be paid for at the unit price bid per each water meter reconnected. The unit price bid shall include all labor, tools, equipment, and incidental materials necessary to reconnect the water meter and restore service. The Contractor shall install a service saddle, corporation cock, new copper service tubing, curb stop, reconnect the water meter, and restore service. New copper services shall be installed from the proposed water main to the existing meter. Copper service pipe and PVC casing will be paid for separately on a per linear foot basis for the size of pipe used. All other materials will be considered incidental and will be included in the unit price. If the existing water meter or box is damaged in the process of reconnection, the Contractor shall replace the meter and/or box at his/her own expense.

64. COPPER WATER SERVICE

Copper tubing for service connections shall be paid for at the unit price bid per linear foot of pipe installed. The cost of service saddles, corporation cocks, new curb stops, and service fittings shall be included in the payment of this item. Longside services shall be bored under the roadway and shortside services can be open cut. The Contractor shall make sure that the new copper service tubing is installed at least eighteen inches below any proposed ditches cut or storm drains installed for the new roadway.

65. REMOVE AND REPLACE RCP

Payment for removal and replacement of RCP storm drains will be made per linear feet of all sizes of RCP pipe replaced. Unit price shall include all labor and materials necessary for removal and replacement.

66. REMOVE AND REPLACE CMP

Payment for removal and replacement of CMP storm drains will be made per linear feet of all sizes of CMP pipe replaced. Unit price shall include all labor and materials necessary for removal and replacement.

67. REMOVE AND REPLACE CONCRETE STORM DRAIN

Payment for removal and replacement of concrete storm drains will be made per linear feet of all sizes of concrete pipe replaced. Unit price shall include all labor and materials necessary for removal and replacement.

68. REMOVE AND REPLACE DROP INLET

Payment for removal and replacement of drop inlets will be made per each drop inlet removed and replaced. Unit price shall include all labor and materials necessary for removal and replacement.

69. REMOVE AND REPLACE TREES AND BUSHES

Payment for removal and replacement of trees and bushes will be made per each for all types and sizes of trees or bushes replaced. Unit price shall include all labor and materials necessary for removal and replacement.

70. ABANDON EXISTING MANHOLE

Abandoning existing manholes shall be paid for at the unit price bid per each for each manhole abandoned and accepted by the Engineer. Unit price shall include all materials, labor and equipment necessary to abandon the manhole.

71. CUT AND PLUG EXISTING SEWER LINE

All cut and plugs shall be paid for at the unit price bid for each size as listed in the proposal. The number of cut and plugs installed shall be counted in the field and shall be full compensation to locate, excavate and plug existing sewer or force main line with concrete.

72. OUTSIDE DROP MANHOLES

Outside Drop Manholes will be counted in place. Payment will be made at the unit price bid per each for outside drop manholes having a depth of six feet or less, measured from the invert of the lowest pipe to the top of the brickwork, and the unit price bid shall include the manhole frame, cover, boots, steps, and water proof manhole frame and cover if required. Payment for each outside drop manhole shall also include all outside vertical piping and other incidentals to construct the outside drop manhole in accordance with the standard details included in the plans. The unit price shall also include the cost of vents where shown on the plans. When the depth of outside drop manholes exceeds six feet, the difference between the actual depth and six feet will be paid for at the unit price bid per vertical foot for extra depth for outside drop manholes.

Where outside drop manholes exceed 16 feet in depth from the rim to the invert, manholes must be supplied with concrete footings and safety platforms as shown on the details. No extra payment shall be made to the contractor for these features as required.

73. WATERTIGHT FRAME & COVERS

Payment for watertight frames and covers as required will be made as a part of the unit price bid for manholes.

74. NPDES INSPECTIONS AND CONSTRUCTION STORM WATER MONITORING IN COMPLIANCE WITH NPDES GAR 100002 PERMIT

In accordance with the storm water monitoring plan and notes on the plans and Section 00820 of these Specifications, certain parts of the compliance have been assigned to the Contractor and certain parts have been assigned to the approved environmental engineer. The bid proposal has been set up to pay the Contractor on a monthly basis for all monitoring, inspecting, filing of notices and reporting as required by the contract documents and the NPDES GAR 100002. For this pay item, a month is defined as 30 days, with the time for the first month beginning on the first day of land disturbance.

75. STREAM BANK STABILIZATION

Stream bank stabilization shall be paid for at the unit price bid per each for each stream bank stabilization installed, restored and accepted. Payment shall include all tools, labor, materials and other incidentals required for the installation as detailed on the plans and described in the Manual for Erosion and Sediment Control in Georgia.

76. BY-PASS PUMPING

Payment for bypass pumping shall be made at the lump sum price bid for all bypass pumping required for all sanitary sewer rehabilitation. The Contractor shall be responsible for plugging or diverting the flow of wastewater as needed for sanitary sewer rehabilitation. Wastewater flow control shall be performed as specified in Section 02600 – Wastewater Flow Control.

77. MOBILIZATION AND DEMOBILIZATION

Payment for the Contractor's mobilization and demobilization efforts shall be made in accordance with the specifics defined in the M&P section of Section 01012.

78. REMOVE AND REPLACE POWER POLE

Power poles removed and replaced shall be paid for at the unit price bid per lump sum for power poles removed and replaced.

****END OF SECTION****

SECTION 01152

APPLICATIONS FOR PAYMENT

PART 1 - GENERAL

- A. Submit applications for Payment to the Engineer in accord with the schedule established by Conditions of the Contracts and Agreements between Owner and Contractor.
- B. Related Requirements in other parts of the Project Manual:
 - 1. Lump Sum: Agreement between Owner and Contractor.
 - 2. Progress payments, retainages and final payment: Conditions of the Contract.
- C. Related Requirements specified in other Sections:
 - 1. Contract Closeout: Section 01700

1.02 FORMAT AND DATA REQUIRED

- A. Submit applications on a form approved by Engineer, with itemized data typed in proper format. All pages of the payment application shall be 8.5" x 11".

1.03 SUBSTANTIATING DATA FOR PROGRESS PAYMENTS

- A. When the Owner or the Engineer requires substantiating data, Contractor shall submit suitable information, with a cover letter identifying:
 - 1. Project.
 - 2. Application number and date.
 - 3. Detailed list of enclosures.
 - 4. For stored products:
 - a. Item number and identification as shown on application.
 - b. Description of specific material.
- B. Submit one copy of data and cover letter for each copy of application.

1.04 SUBMITTAL PROCEDURE

- A. Submit application for payment to the Engineer at the times stipulated in the Agreement.
- B. Number: Five copies of each application.
- C. When the Engineer finds the application properly completed and correct, he will transmit a certificate for payment to Owner, with a copy to Contractor.

****END OF SECTION****

SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Definitions
- B. General Requirements for Submittals
- C. Submittal Procedures
- D. Construction Progress Schedules
- E. Shop and Erection Drawings, Product Data, and Samples
- F. Operations and Maintenance Data
- G. Manufacturers' Certificates
- H. Construction Photographs
- I. Project Record Documents
- J. Video

1.02 RELATED SECTIONS

- A. Section 01450 - Quality Control
- B. Section 01700 - Contract Closeout
- C. Section 01720 - Project Record Documents

1.03 DEFINITIONS

- A. The term "submittals" shall mean shop drawings, if any, manufacturer's drawings, catalog sheets, brochures, descriptive literature, diagrams, schedules, calculations, material lists, performance charts, test reports, office and field samples, and items of similar nature which are normally submitted for the Engineer's review for conformance with the design concept and compliance with the Contract Documents.

1.04 GENERAL REQUIREMENT FOR SUBMITTALS

- A. Project data shall include manufactures' standard schematic drawings modified to delete information which is not applicable to the project. Each copy of descriptive literature shall be clearly marked to identify pertinent information as it applies to the project.

- B. Where samples are required, they shall be adequate to illustrate materials, equipment or workmanship, and to establish standards by which completed Work is judged. Provide sufficient size and quantity to clearly illustrate functional characteristics of product and material, with integrally related parts and attachment devices.
- C. All submittals shall be marked to identify the project, Contractor, subcontractor, or supplier; pertinent Plans; and specification section if applicable.
- D. Prior to submittal to the Engineer, the Contractor shall review and check submittals, and shall indicate review by his stamp, initials, and date.
- E. If the submittals indicate deviations from the Plans and/or Specifications, the Contractor shall advise the Engineer, in the letter of transmittal of the deviation and the reasons thereof. All deviations and variances shall be clearly marked on the submittal with a bold red mark. All additional costs resulting from modifications requested by the Contractor shall be borne by the Contractor.
- F. In the event the Engineer does not specifically reject the use of material or equipment at variance to that which is shown on the Plans or specified, the Contractor shall, at no additional expense to the Owner, and using methods reviewed by the Engineer, make any changes necessary to accommodate the material and equipment.
- G. Additional information on particular items, such as special drawings, schedules, calculations, performance curves, and material details shall be provided when specifically requested in the Specifications.
- H. Where manufacturers' brand names are given in the Specifications the Contractor shall submit names and descriptive literature of such materials and products proposed for use in this Contract.
- I. No material shall be fabricated or shipped unless the applicable drawings or submittals have been reviewed and approved by the Engineer and returned to the Contractor.
- J. All bulletins, brochures, instructions, parts lists, and warranties packaged with and accompanying materials and products delivered to and installed in the project shall be saved and transmitted to the Owner through the Engineer.

1.05 SUBMITTAL PROCEDURES

- A. Scheduling and Handling
 - a. The Contractor shall schedule submittals well in advance of the need for the material or equipment for construction and

shall allow time to make delivery of material or equipment after submittal is approved.

- b. The Contractor shall develop a submittal schedule that allows sufficient time for initial review, correction, resubmission, and final review of all submittals. The Engineer shall review and return submittals to the Contractor as expeditiously as possible but the amount of time required for review will vary depending on the complexity and quantity of data submitted. In no case will a submittal schedule be acceptable which allows less than 30 days for initial review by the Engineer. The time for review shall in no way be justification for delays or additional compensation to the Contractor.
- c. The Engineer's review of submittals covers only general conformity to the Plans, Specification, and general conformity with dimensions and elevations. The Contractor shall be responsible for accuracy of dimensions and elevations. The Contractor shall be responsible for accuracy of dimensions and elevations. No quantities will be determined or verified by the Engineer. The Contractor is responsible for any errors, omissions, or deviations from the contract requirements. Review of submittals in no way relieves the Contractor from his obligation to furnish required items according to the Plans and Specifications.
- d. The Contractor shall submit nine (9) copies of submittal documents unless otherwise specified in the following paragraphs or in the Special Conditions.
- e. The Contractor shall revise and resubmit submittals as required and identify all changes made since previous submittal.
- f. The Contractor shall assume the risk for material or equipment that is fabricated or delivered prior to approval. No material or equipment shall be incorporated into the Work or included in periodic progress payments until approval has been obtained in the specified manner.

B. Transmittal Form and Numbering

- 1. The Contractor shall transmit each submittal with a Submittal Form approved by the Engineer.
- 2. The Contractor shall sequentially number each transmittal form beginning with the number 1.

3. The Contractor shall revise submittals with original number and sequential alphabetic suffix.
4. Videotapes submittal number shall be in accordance with requirements of this section.

C. Contractor's Stamp

1. The Contractor shall apply Contractor's stamp, initials, and date certifying that the items have been reviewed in detail and are correct and in accordance with Contract Documents, except as noted by any requested variance.
2. As a minimum, Contractor's Stamp shall include:
 - a. Contractor's name
 - b. Job number
 - c. Submittal number
 - d. Certification statement that the Contractor has reviewed the submittal and it is in compliance with the Contract Documents.
 - e. Signature line for Contractor
 - f. The Contractor shall place Contractor's Stamp on the front page of each document.

1.06 CONSTRUCTION PROGRESS SCHEDULES

- A. The Contractor shall submit Construction Progress Schedules to the Engineer monthly.

1.07 SHOP AND ERECTION DRAWINGS, PRODUCT DATA, AND SAMPLES

- A. The Contractor shall submit shop and erection drawings, product data, and samples in accordance with Section 01340 - Shop and Erection Drawings, Product Data, and Samples.

1.08 OPERATIONS AND MAINTENANCE DATA

- A. When specified in Specification sections, the Contractor shall submit manufacturers' printed instructions for delivery, storage, assembly, installation, start-up, operation, adjusting, finishing, and maintenance.
- B. The Contractor shall identify conflicts between manufacturers' instruction and Contract Documents.

1.09 MANUFACTURERS' CERTIFICATES

- A. When specified in Specification section, the Contractor shall submit manufacturers' certificate of compliance for review by the Engineer, and for project records.
- B. The Contractor shall 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 the Engineer.

1.10 CONSTRUCTION PHOTOGRAPHS

- A. When required by Specification sections, the Contractor shall submit photographs taken prior to start of construction to show original site conditions.
- B. When required by Specification sections, the Contractor shall submit photographs monthly with pay estimate.
- C. The Contractor shall make two prints; color, matte, finish; 3x5 inch size; mounted on 8-1/2x11 inch soft card stock, with left edge binding margin for three-hole punch. The Contractor shall submit one print to the Engineer and retain the other prints.
 - 1. For linework, the Contractor shall provide photographs at a frequency that will document the Work before and, as the Work is being backfilled.
- D. The Contractor shall identify photographs with date, time, orientation, and project identification.

1.11 PROJECT RECORD DOCUMENTS

- A. The contractor shall submit Project Record Documents in accordance with Section 01720 - Project Record Documents.

1.12 VIDEO

- A. The Contractor shall submit television videotapes as required by the Engineer and/or Owner.
- B. Transmittal forms for videotapes shall be numbered sequentially.

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

Not Applicable

****END OF SECTION****

SECTION 01311

CONSTRUCTION SCHEDULES AND MEETINGS

PART 1 - GENERAL

- A. Promptly after award of the contract, the Contractor shall prepare and submit to the Engineer estimated construction progress schedules for the Work, with subschedules of related activities which are essential to its progress.
- B. Submit revised progress schedules periodically.

1.02 FORM OF SCHEDULES

- A. Prepare schedules in the form of a horizontal bar chart,
 - 1. Provide separate horizontal bar for each trade or operation.
 - 2. Horizontal time scale: Identify the first work day of each week.
 - 3. Scale and spacing: To allow space for notations and future revisions.
 - 4. Minimum sheet size: 11" by 17".
- B. Format of listings: The chronological order of the start of each item of work.
- C. Identification of listings: By major specification section numbers.

1.03 CONTENT OF SCHEDULES

- A. Construction Progress Schedule:
 - 1. Show the complete sequence of construction by activity.
 - 2. Show the dates for the beginning, and completion of, each major element of construction.
 - 3. Show projected percentage of completion for each item, as of the first day of each month.
- B. Submittals Schedule for Shop Drawings, Product data and samples. Show:
 - 1. The dates for Contractor's submittals.
 - 2. The dates approved submittals will be required from the Engineer.
- C. Products Delivery Schedule Dates.
- D. Provide sub schedules to define critical portions of prime schedules.

1.04 PROGRESS REVISIONS

- A. Indicate progress of each activity to date of submission.
- B. Show changes occurring since previous submission of schedules:
 - 1. Major changes in scope.
 - 2. Activities modified since previous submission.
 - 3. Revised projections of progress and completion.
 - 4. Other identifiable changes.
- C. Provide a narrative report as needed to define:
 - 1. Problem areas, anticipated delays, and the impact on the schedule.
 - 2. Corrective action recommended, and its effect.

1.05 SUBMISSIONS

- A. Submit initial schedules within 15 days after award of Contract.
 - 1. The Engineer will review schedules and return review copy within 15 days after receipt.
 - 2. If required, resubmit within 7 days after return of review copy.
- B. Submit revised progress schedules at construction meetings or with each application for payment.
- C. Submit one reproducible transparency and one opaque reproduction.

1.06 DISTRIBUTION

- A. Distribute copies of the reviewed schedules to:
 - 1. Job site file.
 - 2. Subcontractors.
 - 3. Other concerned parties.
- B. Instruct recipients to report promptly to the Contractor, in writing, any problems anticipated by the projections shown in the schedules.

1.07 CONSTRUCTION MEETINGS

- A. A construction meeting shall be scheduled once each month. The meeting shall be held on site at a time and date mutually agreed upon by the Contractor and Engineer and Owner.

1.08 PRECONSTRUCTION CONFERENCE

After award of the bid and prior to beginning construction, a conference will be held with the representatives of the Contractor, Owner, Engineer and the affected utility companies to discuss schedules and utility conflicts in the Project. This conference is intended to establish lines of communication between the parties involved. Time and place of preconstruction conference will be determined at time of bid award.

****END OF SECTION****

SECTION 01340

SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

PART 1 - GENERAL

1.01.1 SCOPE

Submit shop drawings, product data and samples required by the Contract Documents. Designate in the construction schedule, or in a separate coordinated schedule, the dates for submission and the dates that reviewed shop drawings, product data and samples will be needed.

1.02 SHOP DRAWINGS

A. Shop drawings shall be submitted in a clear and thorough manner to the Engineer. Copies returned to the Contractor will be marked as follows:

1. "No Exceptions Noted" - Indicates the drawings have been reviewed for conformance with the contract documents and no exceptions have been taken. Proceed with the work.
2. "Make Corrections Noted" - Indicates the drawings have been reviewed for conformance with the contract documents and work may proceed in accordance with all comments. Resubmittal will not be required.
3. "Revise and Resubmit" - Indicates the drawings have been reviewed for conformance with the contract documents, and work may not proceed. After items to which exceptions have been taken are corrected, Contractor shall again submit copies for review.
4. "Rejected" - Indicates the drawings have been reviewed for conformance with the contract documents and are too incomplete or in an unacceptable condition for review. A notation will be made on the shop drawings as to the exceptions taken. Drawings shall be revised and resubmitted for review before proceeding with the work.
5. "Submit Specified Item" - Indicates that one or more items in the submittal were missing or incomplete. Work may commence on any items to which no exceptions were taken; missing or incomplete items must be submitted as noted.

B. Details shall be identified by reference to sheet and detail, schedule or room numbers shown on Contract Drawings.

1.03 PRODUCT DATA

A. Preparation

1. Clearly mark each copy to identify pertinent products or models.

2. Show performance characteristics and capacities.
3. Show dimensions and clearances required.
4. Show wiring or piping diagrams and controls.

B. Manufacturer's standard schematic drawings and diagrams:

1. Modify drawings and diagrams to delete information which is not applicable to the work.
2. Supplement standard information to provide information specifically applicable to the work.

1.04 SAMPLES

A. Office samples shall be of sufficient size and quantity to clearly illustrate:

1. Functional characteristics of the product, with integrally related parts and attachment devices.
2. Full range of color, texture and pattern.

1.05 CONTRACTOR RESPONSIBILITIES

A. Review shop drawings, product data and samples prior to submission.

B. Determine and verify:

1. Field measurements.
2. Field construction criteria.
3. Catalog numbers and similar data.
4. Conformance with specifications.

C. Coordinate each submittal with requirements of the work and of the contract documents.

1. Notify the Engineer in writing, at time of submission, of any deviations in the submittals from requirements of the contract documents.
2. Begin no fabrication or work which requires submittals until return of submittals with Engineer approval.

1.06 SUBMISSION REQUIREMENTS

A. Make submittals promptly in accordance with approved schedule, and in such sequence as to cause no delay in the work or in the work of any other contractor.

B. Telecopier sheets, Faxes, and copies of faxes are not allowed as shop drawing submittals.

C. Number of submittals required:

1. Shop drawings: Submit the number of opaque reproductions which the Contractor requires plus three copies which will be retained by the Engineer.
2. Product data: Submit the number of copies which the Contractor requires, plus three which will be retained by the Engineer.
3. Samples: Submit the number stated in each specification section.

D. Submittals shall contain:

1. The date of submission and the dates of any previous submissions.
2. The project title and number.
3. Contract identification.
4. The names of:
 - a. Contractor.
 - b. Supplier.
 - c. Manufacturer.
5. Identification of the product, with the specification section number.
6. Field dimensions, clearly identified as such.
7. Relation to adjacent or critical features of the work or materials.
8. Applicable standards, such as ASTM or Federal Specifications numbers.
9. Identification of deviations from contract documents.
10. Identification of revisions on resubmittals.
11. An 8 in. x 3 in. blank space for contractor and Engineer stamps.
12. Contractor's stamp, initialed or signed, certifying his review of submittal, verification of products, field measurements and field construction criteria, and coordination of the information within the submittal with requirements of the Work and of Contract Documents.

1.07 RESUBMISSION REQUIREMENTS

A. Make any corrections or changes in the submittals required by the Engineer and resubmit until approved.

B. Shop Drawings and Product Data:

1. Revise initial drawings or data and resubmit as specified for the initial submittal.

2. Indicate any changes which have been made other than those requested by the Engineer.

C. Samples: Submit new samples as required for initial submittal.

****END OF SECTION****

SECTION 01410

TEST REQUIREMENTS

GENERAL

Materials furnished for all construction shall be subject to test at all times by the Engineer and any samples or specimens selected for test shall be furnished at no cost. The cost of all such test shall be borne by the contractor. All tests shall be made by a recognized testing laboratory, acceptable to the Engineer. The following minimum test reports or certificates shall be furnished to the Engineer prior to incorporation of the material in the work.

Cement: Certified mill tests that all cement meets the applicable specifications and that it is not more than 90 days from date of manufacture to incorporation into the work.

Concrete: See Section 03000.

Fine Aggregate: Approval of source of supply by the Engineer and certificate by supplier that the specifications have been met.

Coarse Aggregate: Same as above for fine aggregate.

Brick: No laboratory tests will be required of brick, unless so directed by the Engineer.

P.V.C. Sewer Pipe: P.V.C. sewer pipe shall be tested to certify that the pipe meets the material specifications.

Ductile Iron Pipe: Certified tests of the manufacturer that the pipe furnished meets the material specifications in Section 02606 and 02710.

Precast Manholes: Shop drawings of manholes shall be submitted showing the complete design of the manhole proposed. Engineer's approval of design, materials and manufacturing procedure shall be obtained before any manholes are delivered to the job site.

Bitumastic Materials: Manufacturers furnishing bitumastic materials shall supply certified test reports in duplicate that their materials meet the specifications. The quarry furnishing stone for the base shall furnish certified test reports that their material meets the specifications.

Asphaltic Plant Mix: A certificate shall be furnished by the supplier of an asphaltic plant mix that the material furnished meets the requirements of the specifications of the Georgia Highway Department.

Soil Testing: General. The Contractor will select a qualified independent testing laboratory for the purpose of identifying soils, checking densities, and classifying soils materials during construction. Payment for the testing will be by the Contractor.

The Contractor shall include the cost of retaining a soils testing agency during backfill operation to adequately test each 6 inch lift of backfill. Proper compaction shall be obtained for each lift before continuing backfill operation on top of that lift. Compaction reports shall be submitted to the engineer showing passing compaction tests for each lift.

Moisture-Density Tests. Testing shall be in accordance with ASTM Methods D698 and D1557. A test shall be performed on each type of material used in the work regardless of source. Tests will be accompanied by particle-size analyses of the soils tested (ASTM Methods D421 and D422). Changes in color, gradation, plasticity or source of fill material will require the performance of additional tests. Copies of all test results shall be furnished the Engineer.

Field Density Tests. Tests shall be made in accordance with ASTM Method D1556. If any compaction test reveals that fill or backfill is not compacted as specified, the Contractor shall scarify and re-compact as required to achieve the specified density. Additional compaction tests shall be made to verify proper compaction.

Submittals. The soils technician will submit formal reports of all compaction tests and retests to the Contractor, Owner and Engineer as soon as possible upon completion of the required tests.

This report information is to include but not be limited to the following:

1. Date of the test and date submitted.
2. Location of test.
3. Wet weight, moisture content and dry weight of field sample.
4. Description of soil.
5. Maximum dry density and moisture content of the lab sample which best matches the field sample in color, texture, grain size and maximum dry density.
6. Ratio of field dry density to maximum lab dry density expressed as a percentage.
7. Comments concerning the field density passing or failing the specified compaction.
8. Comments about re-compaction if required.

Compaction Results. The soils technician is to advise the Engineer and Contractor immediately of any compaction tests failing to meet the specified minimum requirements. No additional lift is to be placed on a lift with any portion failing.

Grading: Upon completion of other construction operations, the entire site, within the limits shown on the Drawings, shall be brought to the finished grades indicated and which will provide proper drainage. All surfaces shall be raked smooth and shall be free of all vegetable matter, debris and stones larger than 2-1/2 inches. Allow for thickness of required stone.

Mill Tests: Mill tests, if any, shall be conducted and reports submitted as specified for such material. Mill or shop tests shall be accomplished by the manufacturer or supplier of the materials, and may be conducted by an independent testing laboratory. These tests shall be performed in accordance with the ASTM Standard, if specified, or with other applicable standards.

The cost of mill tests shall be included in the lump sum price bid, and no additional payment will be made.

Laboratory Tests: Laboratory tests shall be conducted and test reports submitted where this type of test is specified. All laboratory tests shall be made by a reputable independent laboratory. These tests shall be performed in accordance with ASTM Standards, if specified, or other applicable standards if no reference is included.

The contractor shall arrange for all tests of preliminary samples of materials and mixtures, in order to determine suitability of source and for initial design mixes of concrete. The cost of these preliminary tests shall be included in the lump sum price of the contract and no additional payment will be made.

Routine tests of materials incorporated into the project will be performed by an independent testing laboratory. Samples shall be provided by the Contractor. The Contractor will pay for all concrete cylinder tests and preliminary tests to determine initial design mixes.

Soils tests for gradation, moisture content and density will be paid for by the Contractor.

Field Tests: Field tests of mechanical and electrical equipment, piping systems, electrical systems, control systems, ventilation systems, heating systems, water mains, pressure mains, sewers, drains, and similar facilities shall be conducted where this type of test is specified.

Field tests include determination of performance, capacity, efficiency, function, tightness, leakage or other special requirements. These tests shall be performed in accordance with applicable standards and test codes.

Field tests shall be set up and accomplished by the Contractor who shall provide all tools, equipment, instruments, personnel and other facilities required for the satisfactory completion of each test.

Factory Tests: Factory tests of mechanical and electrical equipment relative to performance, capacity, rating, efficiency, function or special requirements shall be conducted in the factory or shop for each item when this type of test is specified. These tests shall be performed in accordance with applicable standards and test codes.

Factory tests shall be set up and accomplished by the equipment manufacturer who shall provide all shop space, tools, equipment, instruments, personnel and other facilities required for the satisfactory completion of each test.

The cost of factory tests shall be included in the lump sum price of the Contract and no additional payment will be made for factory testing.

Reference Standards: Reference to the standards of any technical society, organization, or association, or to codes of local or state authorities, shall mean the latest standard, code, specification, or tentative standards adopted and published at the date of taking bids, unless specifically state otherwise.

Qualifications of Laboratory:

- A. Meet "Recommended Requirements for Independent Laboratory Qualification", published by American Council of Independent Laboratories.
- B. Meet basic requirements of ASTM E 329, "Standards of Recommended Practice for Inspection and Testing Agencies for concrete and steel as used in construction."
- C. Authorized to operate in the State in which the Project is located.

Laboratory Duties:

- A. Promptly submit written report of each test and inspection: One copy each to the Engineer, Owner, Contractor, and one copy to Record Documents file. Each report shall include:
 - 1. Date issued.
 - 2. Project title and number.
 - 3. Testing laboratory name, address and telephone number.
 - 4. Name and signature of laboratory inspector.
 - 5. Date and time of sampling or inspection.
 - 6. Record of temperature and weather conditions.
 - 7. Date of test.
 - 8. Identification of product and specification section.
 - 9. Location of sample or test in the project.
 - 10. Type of inspection or test.
 - 11. Results of tests and compliance with contract documents.
 - 12. Interpretation of test as required by the Engineer or the Owner.

- B. Perform additional tests as required by the Engineer or the Owner.

Limitations of Authority of Testing Laboratory:

- A. Laboratory is not authorized to:
 - 1. Release, revoke, alter or enlarge on requirements of Contract Documents.
 - 2. Approve or accept any portion of the work.
 - 3. Perform any duties of the contractor.

Contractor's Responsibilities:

- A. Cooperate with laboratory personnel provide access to work, to Manufacturer's operations.
- B. Secure and deliver to the laboratory adequate quantities of representational samples of materials proposed to be used and which require testing.
- C. Provide to the laboratory the preliminary design mix proposed to be used for concrete, and other materials mixes which require control by the testing laboratory.
- D. Furnish copies of products test reports as required.
- E. Furnish incidental labor and facilities:
 - 1. To provide access to work to be tested.
 - 2. To obtain and handle samples at the project site or at the source of the product to be tested .
 - 3. To facilitate inspections and tests.
 - 4. For storage and curing of test samples.
- F. Notify laboratory sufficiently in advance of operations to allow for laboratory assignment of personnel and scheduling of tests.
 - 1. When tests or inspections cannot be performed after such notice, reimburse Owner for laboratory personnel and travel expenses incurred due to Contractor's negligence.
- G. Employ and pay for the services of a separate, equally qualified independent testing laboratory to perform additional inspections, sampling and testing required:

1. For the Contractor's convenience.
2. When initial tests indicate work does not comply with Contract Documents.

****END OF SECTION****

SECTION 01450
QUALITY CONTROL

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Quality Assurance
- B. Control of Work
 - 1. Authority of Engineer
 - 2. Owner as Engineer
 - 3. Conformity with Plans and Specifications
 - 4. Cooperation of Contractor
 - 5. Cooperation Between Contractors
 - 6. Construction Layouts
 - 7. Authority and Duties of Engineer's Inspector
 - 8. Owner's Representative
 - 9. Inspection of the Work
 - 10. Removal of Unacceptable and Unauthorized Work
 - 11. Load Restrictions
 - 12. Maintenance During Construction
 - 13. Failure to Maintain the Work
 - 14. Test period and Final Acceptance
- C. Control of Materials
 - 1. Source of Supply and Quality Requirements
 - 2. Certification of Compliance
 - 3. Plant Inspection
 - 4. Storage of Materials and Equipment
 - 5. Unacceptable Materials

6. Owner-Furnished Materials

7. Transportation of Materials

1.02 RELATED SECTIONS

A. Section 01090 - Reference Standards.

B. Section 01300 - Submittals.

1.03 QUALITY ASSURANCE

- A. The Contractor shall monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. The Contractor shall comply with manufacturer's instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, the Contractor shall request clarification from the Engineer before proceeding.
- D. The Contractor shall comply with specified standards as minimum quality for the Work except where more stringent tolerance, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. All Work shall be performed by persons qualified to produce required and specified quality.
- F. The Contractor shall verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
- G. The Contractor shall not subcontract work involving excavation, including pipe replacement point repairs, point repairs at manhole connections, manhole replacement, and service lateral reconnection and repair. Work involving excavation shall be performed by the Prime Contractor who must be qualified to construct Class "A" sewer lines.

1.04 CONTROL OF WORK

A. Authority of Engineer

- 1. The Engineer shall give all orders and directions contemplated under this Contract relative to the execution of the Work. The Engineer shall determine the amount, quality, acceptability, and fitness of the several kinds of Work and materials that are to be paid for under this Contract and shall decide all questions that may arise in relation to said Work and the construction thereof. The Engineer's estimates and decisions shall be final and conclusive, except as otherwise expressly provided herein. Should any

questions arise between the parties relative to the Contract, the determination or decision of the Engineer shall be precedent to the right of the Contractor to receive any money or payment for Work.

2. The Engineer shall decide the meaning and intent of any portion of the Specifications and of any Plans or Standard Drawings where the same may be found obscure or to be in dispute.
3. Any differences or conflicts in regard to their work that may arise between the Contractor under this Contract and other contractors performing work for the Owner shall be adjusted and determined by the Engineer.
4. The Owner, in consultation with the Engineer, shall have the authority to suspend the Work wholly in part, due to failure of the Contractor to carry out provisions of the Contract; for failure to carry out orders; for such periods as he may deem necessary due to unsuitable weather; for conditions considered unsuitable for prosecution of the Work; or for any other condition or reason deemed to be in the public interest.
5. The Engineer shall have the authority to regulate and coordinate the stages of progress of construction, or items of Work of the respective Contractors to affect necessary cooperation and satisfactory performance and completion. The Engineer's decision shall be binding in any dispute in the Work arising between Contractors.

B. Owner as Engineer

1. The Marietta BLW, as Owner, may choose to carry out the surveying, engineering design, and/or construction inspection for a particular Contract or Project, in which case the applicable references in these Specifications to Engineer and Engineer's inspector shall be construed as referring to the Owner or the Owner's agents and employees.

C. Conformity with Plans and Specifications

1. All Work and all materials furnished shall be in close conformity with the liens, grades, trenching sections, cross-sections, dimensions, material requirements, and testing requirements that are specified (including specified tolerances) in the Plans and Specifications.
2. If the Engineer finds the materials furnished, Work performed, or finished product not within close conformity with the Plans and Specifications, but that the portion of the Work affected will, in his opinion, result in a finished product having a level of safety, economy, durability, and workmanship acceptable to the Owner,

he will advise the Owner of his determination that the affected Work be accepted and remain in place. In this event, the Engineer will document his determination and recommend to the Owner a basis of acceptance that may provide for an adjustment in the Contract Price for the affected portion of the Work. The Engineer's determination and recommended Contract Price adjustments will be based on sound engineering judgment and such tests and retests of affected Work as are, in his opinion, needed. Changes in the Contract Price shall be covered by change order.

3. If the Engineer finds the material furnished, Work performed, or the finished product are not in close conformity with the Plans and Specifications and have resulted in an unacceptable finished product, the affected Work or materials shall be removed and replaced or otherwise corrected by, and at the expense of the Contractor in accordance with the Engineer's written notification.
4. For the purpose of this subsection, the term "close conformity" shall not be construed as waiving the Contractor's responsibility to complete the Work in accordance with the Contract, Plans, and Specifications. The term shall not be construed as waiving the Engineer's right to insist on strict compliance with the requirements of the Contract, Plans, and Specifications during the Contractor's prosecution of the Work when, in the Engineer's opinion, such compliance is essential to provide an acceptable finished portion of the Work.
5. For the purpose of this subsection, the term "close conformity" is also intended to provide the Engineer with the authority to use sound engineering judgment in his determinations as to acceptance of Work that is not in strict conformity but will provide a finished product equal to or better than that intended by the requirements of the Contract, Plans, and Specifications.

D. Cooperation of Contractor

1. The Contractor shall, and will, in good workmanlike manner, do and perform all Work and furnish all supplies and materials, machinery, equipment, facilities, and means, necessary for proper completion of all the Work required by the Contract, within the time specified, and in accordance with provisions of these Contract Documents. The Work performed shall be in accordance with the directions of the Engineer. The Contractor shall furnish, erect, maintain, and remove such temporary works as may be required. The Contractor alone shall be responsible for the safety, efficiency, and adequacy of his operations, appliances, methods, and for any damage which may result from the failure or improper construction, maintenance, or operation. The Contractor shall observe, comply with, and be subject to all terms, conditions,

requirements, and limitations of the Contract Documents, and shall do, carry on, and complete the entire Work to the satisfaction of the Engineer and the Owner.

2. If, through acts of neglect on the part of the Contractor, any other contractor or any subcontractor suffers loss or damage on their work, the Contractor agrees to settle with such other contractor or subcontractor by agreement or arbitration. If such other contractor or subcontractor shall assert any claim against the Owner on account of any damage alleged to have been sustained, the Owner shall notify the Contractor who shall indemnify and save harmless the Owner against any such claim.
3. The Contractor will be supplied with two copies each of the Plans and Specifications. The Contractor shall have on the Work at all times one copy each of the Plans and Specifications. A reasonable number of additional copies of Plans and Specifications may be obtained by the Contractor upon request.
4. The Contractor shall give constant attention to the Work to facilitate the progress thereof, and he shall cooperate with the Engineer and the Resident Project Representative and with other Contractors in every way possible. The Engineer shall allocate the Work and suggest the sequence of construction in case of controversy between Contractors. THE CONTRACTOR SHALL HAVE COMPETENT SUPERINTENDENT ON THE WORK AT ALL TIMES WHO IS FULLY AUTHORIZED AS HIS AGENT ON THE WORK. The superintendent shall be capable of reading and thoroughly understanding the Plans and Specifications and shall receive and fulfill any instructions from the Engineer or his authorized representative.

E. Construction Layout

1. The Owner reserves the right to contract for and perform other or additional work on or near the Work covered by this Contract.
2. When separate contracts are let within the limits of any one project, each contractor shall conduct his work so as not to interfere with or hinder the progress of completion of the work being performed by other contractors, contractors working on the same project shall cooperate with each other as directed by the Engineer.
3. Each contractor involved shall assume all liability, financial or otherwise, in connection with his contract and shall protect and save harmless the Owner and Engineer from any and all damages or claims that may arise because of inconvenience, delays, or loss

experienced by him because of the presence and operations of other contractors working within the limits of the same project.

4. The Contractor shall arrange his work and shall place and dispose of the materials being used so as not to interfere with the operation of other contractors within the limits of the same project. He shall join his work with that of the others in an acceptable manner shall perform it in proper sequence to that of the others to the satisfaction of the Engineer.

F. Construction Layout

1. The Engineer will furnish the Contractor with benchmarks, control points, and any other measurements that the Engineer may deem necessary for the proper prosecution and control of the Work.
2. The Contractor shall satisfy himself as to the accuracy of all measurements before proceeding with the Work. All stakes and markings set by the Engineer for his own use or for the Contractor's guidance shall be scrupulously preserved by the Contractor. Any stakes or markings lost or destroyed by the Contractor's forces through negligence shall be replaced by the Engineer at the Contractor's expense when so ordered by the Engineer.
3. The Contractor shall furnish, free of charge, to the Engineer, such incidental labor as he may require in establishing points and lines necessary to the prosecution of the Work to satisfactory completion.

G. Authority and Duties of Engineer's Inspector

1. The Engineer's Inspector shall have full authority to reject any defective material or workmanship and to inform the Contractor that construction is being improperly performed (if such is the case), subject to final decision of the Engineer. Engineer's Inspectors will not be authorized to revoke, alter, enlarge, or relax the provisions of the Plans and Specifications or to issue any instructions contrary thereto.
2. The Contractor may request, and the Engineer will issue, written instructions on any important questions which may develop in respect to the acceptance or rejections of materials or workmanship.

H. Owner's Representative

1. The Owner may assign a representative to observe the construction of the Work and advise the Owner of the Work's prosecution. The resident project representative shall not act as inspector. The

Contractor shall continue to deal directly with the Engineer's Inspector as described above. The Owner's Representative shall have full access to all job records and shall be allowed to take supplemental samples of materials used on the job.

I. Inspection of the Work

1. The Owner's Field Representative will observe all phases of the Work in progress. The Contractor shall furnish the Owner and Engineer with every reasonable facility for ascertaining whether or not the Work as performed is in accordance with the requirements and intents of the Plans and Specifications. Should any Work be covered or hidden prior to the approval thereof by the Owner's Field Representative, it shall be uncovered for examination and recovered at the Contractor's expense.
2. Should the Contract Work include relocation, adjustment, or any other modification to existing facilities, not the property of the Owner, authorized representatives of the owners of such facilities shall have the right to inspect such work. Such inspection shall in no case make any facility owner a party to the Contract, and shall in no way interfere with the rights of the parties to this Contract.

J. Removal of Unacceptable and Unauthorized work

1. All work that does not conform to the requirements of the Contract, Plans, and Specifications will be considered by the Engineer as provided in this section.
2. Unacceptable Work, whether the result of poor workmanship, use of defective materials, damage through carelessness, or any other cause found to exist prior to the final acceptance of Work, shall be removed immediately and replaced in an acceptable manner in accordance with the provision of section 01700 - Contract Closeout.
3. No work shall be done without lines and grades having been approved by the Engineer. Work done contrary to the instructions of the Engineer, work done beyond the lines shown on the Plans, except as herein specified, or extra work done without authority, will be considered as unauthorized and will not be paid for under the provisions of this Contract. Work so done may be ordered removed or replaced at the Contractor's expense.
4. Upon failure on the part of the Contractor to comply forthwith with any order of the Engineer made under the provisions of this section, the Engineer will have authority to cause unacceptable work to be remedied or removed and replaced and unauthorized work to be removed and to recover the costs incurred by the Owner

from the Contractor. Said monies may be deducted from any amounts due the Contractor.

K. Load Restrictions

1. The Contractor shall comply with all legal load restrictions in the hauling of materials on public roads beyond the limits of the Work. A special permit will not relieve the Contractor of liability for damage that may result from the moving of material or equipment.
2. The operation of equipment of such weight or so loaded as to cause damage to structures or to any other type of construction will not be permitted. Hauling of materials over a base course or surface course under construction shall be limited as directed by the Engineer. No loads will be permitted on a concrete pavement, base, or structure, before the expiration of the curing period. The Contractor shall be responsible for all damage done by his hauling equipment and shall correct such damage at his own expense.

L. Maintenance During Construction

1. The Contractor shall maintain the Work during construction and until the Work is accepted. This maintenance shall constitute continuous and effective Work prosecuted day by day, with adequate equipment and forces so that the Work is maintained in satisfactory condition at all times.
2. All costs of maintenance work during construction and before the project is accepted shall be included in the unit prices bid on the various Contract Items, and the Contractor will not be paid an additional amount for such work.

M. Failure to Maintain the Work

1. Should the Contractor at any time fail to maintain the Work as provided in this section, the Engineer shall immediately notify the Contractor of such noncompliance. Such notification shall specify a reasonable time within which the Contractor shall be required to remedy such unsatisfactory maintenance to the exigency that exists.
2. Should the Contractor fail to respond to the Engineer's notification, the Engineer may suspend any work necessary for the Owner to correct such unsatisfactory maintenance condition, depending on the exigency that exists. Any maintenance cost incurred by the Owner shall be recovered from the Contractor in the manner deemed most appropriate by the Owner.

N. Test Period and Final Acceptance

1. As each separate principal part of the Work is completed it shall be immediately inspected by the Engineer. If found to be in substantial compliance with the Plans and Specifications, it shall be tentatively accepted by the Engineer. Thereafter, all such completed and accepted parts of the Work shall be maintained in good condition by and at the expense of the Contractor until final acceptance by the Owner of all Work covered by the Contract.
2. After the principal operating parts of the Work have been completed and tentatively accepted, they shall be operated simultaneously as a single unit, by and at the expense of the Contractor in the presence of the Engineer, for a period of not less than thirty (30) days. During the test period, the Contractor shall make all such repairs and/or adjustments as may be found necessary to develop the capacities and complete operating functions called for or implied in the Specifications.
3. Operation and maintenance work prior to, during, and after the test period shall be by and at the expense of the Contractor shall be continued until all work performed under the Contract has been formally accepted by the Owner.
4. After the test period has been concluded and the construction of all work under Contract has been completed, the Engineer, the Contractor, and a representative of the Owner shall make a joint final inspection of all phases of the Work. If the Work is not acceptable at the time of such inspection, the Engineer will notify the Contractor of the defects that must be remedied before final acceptance can be made.

1.05 CONTROL OF MATERIALS

A. Source of Supply and Quality Requirements

1. The materials used in the Work shall conform to the requirements of the Contract, Plans, and Specifications. Unless otherwise specified, such materials that are manufactured or processed shall be new (as compared to used or reprocessed).
2. In order to expedite the inspection and testing of materials, the Contractor shall furnish complete statements to the Engineer as to the origin, composition, and manufacture of all materials used in the Work. Such statements shall be furnished promptly after execution of the Contract, but in all cases prior to delivery of such materials.
3. At the Engineer's option, materials may be approved at the source of supply before delivery is started. If it is found that source's of

supply of previously approved materials do not produce specified products; the Contractor shall furnish materials from other sources.

B. Certification of Compliance

1. The Engineer may permit the use (with the approval of the Owner), prior to sampling and testing, of certain materials or assemblies when accompanied by manufacturer's certificates of compliance stating that such materials or assemblies fully comply with the requirements of the Contract. The certificate shall be signed by the manufacturer. Each lot of such materials or assemblies delivered to the Work must be accompanied by a certificate of compliance in which the lot is clearly identified.
2. Materials or assemblies used on the basis of certificates of compliance may be sampled and tested at any time and, if found not to be in conformity with Contract requirements, will be subject to rejection whether in place or not.
3. The form and distribution of certificates of compliance shall be as approved by the Engineer.
4. When a material or assembly is specified by "brand name or equal" and the Contractor elects to furnish the manufacturer's certificate of compliance for each lot of such material or assembly delivered to the Work, such certificate for compliance shall clearly identify each lot delivered and shall certify as to conformance to the specified performance, testing, quality, or dimensional requirements; and suitability of the material or assembly for the use intended in the Contract Work.
5. Should the Contractor propose to furnish an "or equal" material or assembly the Contractor shall furnish the manufacturer's certificates of compliance as herein before described for the specified brand name material or assembly. However, the Engineer shall be the sole judge as to whether the proposed "or equal" is suitable for use in the Work.
6. The Engineer reserves the right to refuse permission for use of materials or assemblies on the basis of certificates of compliance.
7. It is understood and agreed that the Owner shall have the right to retest any material which has been tested and approved at the source of supply after it has been delivered to the site. The Engineer shall have the right to reject only material which, when retested, does not meet the requirement of the Contract, Plans or Specifications.

C. Storage of Materials and Equipment

1. Materials shall be stored to assure the preservation of their quality and fitness for the Work. Stored materials, even though approved before storage, may again be inspected prior to their use in the Work. Stored materials shall be located to facilitate their prompt inspection. The Contractor shall coordinate the storage of all materials with the Engineer. Storage facilities shall be provided at the expense of the Contractor, and all costs shall be included in the unit prices bid on the various Contract Items. The Contractor will not be paid an additional amount for the provision of such storage facilities.
2. Machinery, control equipment, etc. subject to damage by exposure to the elements shall be stored in a bonded warehouse or other locations that have been approved by the Engineer.
3. Unless otherwise shown on the Plans, the storage of materials and the location of the Contractor's parked equipment or vehicles shall be as directed by the Engineer. Private property shall not be used for storage purposes without written permission of the private property owner or lessee of such property. The Contractor shall make all arrangements and bear all expenses for the storage of materials on private property. Upon request, the Contractor shall furnish the Engineer a copy of the property owner's permission. All storage sites on private property shall be restored to their original condition by the Contractor entirely at his own expense, except otherwise agreed to, in writing by the private property owner or lessee of the property.
4. The Contractor shall be responsible for loss, damage, or deterioration of materials and equipment caused by improper protection from the weather or from other sources of damage.

D. Unacceptable Materials

1. Any materials or assembly that does not conform to the requirements of the Contract, Plans, or Specifications shall be considered unacceptable and shall be rejected. The Contractor shall remove any rejected materials or assembly from the site of the Work, unless otherwise instructed by the Engineer.
2. No rejected material or assembly, the defects of which have been corrected by the Contractor, shall be returned to the site of the Work until such time as the Engineer has approved its use in the Work.

E. Owner-furnished Materials

1. The Contractor shall furnish all materials required to complete the Work, except those specified (if any) to be furnished by the Owner.
2. All costs of handling, transportation from the specified location to the site of Work, storage, and installation of Owner-furnished materials shall be included in the unit price bid for the Contract Item in which such Owner-furnished material is used. No additional payment for handling transportation will be made.
3. After any Owner-furnished material has been delivered to the locations specified, the Contractor shall be responsible for any demurrage, damage, loss, or other deficiencies that may occur during the Contractor's handling, storage, or use of such Owner-furnished material. The Owner will recover from the Contractor any cost incurred by the Owner in making good such loss due to the Contractor's handling, storage, or use of Owner-furnished materials.

F. Transportation of Materials.

1. Materials, including pipe, shall be transported in such a manner as to protect the materials for damage. Materials, even though inspected and approved before transportation, may again be inspected and/or tested after delivery to the site. Any damaged and/or unacceptable materials shall be removed from the site and replaced with materials meeting the Specifications.
2. The costs of transportation of materials and for replacing damaged or defective materials shall be borne by the Contractor.

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

Not Applicable

****END OF SECTION****

SECTION 01455

LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Laws to be observed
- B. Permits, Licenses, and Taxes
- C. Patented Devices, Materials, and Processes
- D. Responsibility for Safety
- E. Sanitary, Health, and Safety Precautions
- F. Public Convenience and Safety
- G. Protection and Restoration of Property
- H. Responsibility for Damage Claims
- I. Third Party Beneficiary Clause
- J. Use of a Section or Portion of the Work
- K. Privileges of the Contractor in Streets, Alleys, and Rights-of-Way
- L. Railway and Highway Crossings
- M. Personal Liability of Public Officials
- N. No Waiver or Legal Rights
- O. Environmental Protection
- P. Archeological and Historical Findings

1.02 RELATED SECTIONS

- A. Section 01570 - Traffic Regulations
- B. Section 02210 - Soil Erosion and Sediment Control

1.03 LAWS TO BE OBSERVED

- A. The Contractor shall be and remain fully informed of all federal and state laws, all local laws, ordinances, regulations and all orders and decrees of bodies or tribunals having any jurisdiction or authority which in any manner affect those engaged or employed in the Work, or which in anyway affect the conduct of the Work. He shall at all times observe and comply with all such laws, ordinances, regulations, orders, and decrees; and shall protect and indemnify the Owner and all his officers, agents, or servants against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order, or decree, whether by the Contractor or his employees.

1.04 PERMITS, LICENSES, AND TAXES

- A. The Contractor shall procure all permits and licenses, including those permits required by the Owner, pay all charges or fees, and give all notices necessary and incident to the due and lawful prosecution of the Work. There shall be no charge for building permits obtained from the Owner when the Contractor is building a structure for the Owner.

1.05 PATENTED DEVICES, MATERIALS, AND PROCESSES

- A. The Contractor shall hold and save the Owner and its officers, agents, servants, and employees harmless from liability of any nature or kind, including cost and expenses for, or on account of, any patented or unpatented invention, process, article, or appliance manufactured or used in the performance of the Contract, including its use by the Owner, unless otherwise specifically stipulated in the Contract Documents.
- B. If the Contractor uses any design, device or materials covered by letters, patent, or copyright, he shall provide for such use by suitable agreement with the owner of such patented, or copyrighted design, device, or material. It is mutually agreed and understood that without exception, the contract prices shall include all royalties or costs arising from the use of such design, device, or materials, in anyway involved in the Work. The Contractor and/or his sureties shall indemnify and save harmless the Owner from any and all claims for infringement by reason of the use of such patented or copyrighted design, device, or materials, or any trademark or copyright in connection with Work agreed to be performed under this Contract and shall indemnify the Owner for any cost, expense, or damage which it may be obligated to pay by reason of such infringement at anytime during the prosecution of the Work or after completion of the Work.

1.06 RESPONSIBILITY FOR SAFETY

- A. The Contractor, in the prosecution of his Work under this contract, is bound by the requirements of "Safety and Health Regulations for Construction" of the Occupational Safety and Health Administration, U.S.

Government Department of Labor, and of other authorities having jurisdiction in safety manners.

- B. Under the terms and conditions of this Contract, the Engineer and/or the Owner shall not act as Safety Engineer or Safety Supervisor, since such responsibility remains solely with the Contractor. The Engineer and/or the Owner shall not be responsible for establishing safety practices or for prescribing safety measures for the Contractor.
- C. The Contractor is solely and completely responsible for conditions of the job site, including safety of all persons and property affected directly or indirectly by his operation during the performance of the Work; and this requirement is not limited in application to normal working hours, but applies continuously twenty-four (24) hours per day until acceptance of the Work by the Engineer, and thereafter shall be subject to the terms and conditions of the Guaranty.
- D. The duty of the Owner and the Engineer to review the Work in order to determine its acceptability in accordance with the Specification and to conduct construction review of the Contractor's performance for the benefit of the Owner, shall not construed as a duty to review the adequacy of the Contractor's safety measures on or near the construction site and/or to direct the actions of the Contractor's employees in the performance of the Work as such a duty is not included in the responsibilities of the Owner and the Engineer.

1.07 SANITARY, HEALTH, AND SAFETY PRECAUTIONS

- A. The Contractor shall provide and maintain in a neat, sanitary condition such accommodations for the use of his employees as may be necessary to comply with the requirements of the State and Local Board of Health, or other bodies or tribunals having that jurisdiction. These accommodations shall be properly secluded from public observation. The Contractor is reminded that the guidelines set forth by the Occupational Safety and Health Act shall be the minimum that will govern working conditions during construction.
- B. Attention is directed to federal, state, and local laws, rules, regulations concerning construction safety and health standards. The Contractor shall not require any worker to work in surroundings or under conditions that are unsanitary, hazardous, or dangerous to his health or safety.
- C. All chemicals used during construction of the project or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer, reagent, or of other classification, must show approval of EPA, USDA, or FDS, according to the purpose for such chemicals and the disposal of residues there from are subject to the instructions of the manufacturers of the respective chemicals.

1.08 PUBLIC CONVENIENCE AND SAFETY

- A. The Contractor shall control his operations and those of his subcontractors and all suppliers to assure the least inconvenience to the traveling public. Under all circumstances, safety shall be the most important consideration.
- B. Where the Work is located in or near streets, alleys, or highway right-of-ways, the Contractor shall store construction materials and perform the Work in such a manner as will provide adequate and satisfactory convenience for the general public and residents along the Work.
- C. The Contractor shall contact all utilities affected by his Work, and coordinate with them such that fire, police, sanitation services, etc. will not be adversely affected.
- D. Storage of materials and the Work shall be arranged so that there shall be free access to all fire hydrants, valves, manholes and other utility appurtenances.
- E. The Contractor shall take such precautionary measures in the performance of the Work as will give maximum protection at all times to persons and property near the Work.

1.09 PROTECTION AND RESTORATION OF PROPERTY

- A. The Contractor shall not enter upon private property except right-of-way easements for any purpose without first obtaining permission from its owner and lessees, and he shall be responsible for the preservation of, and shall use every precaution necessary to prevent damage to all trees, shrubbery, fences, culverts, bridges, pavement, driveways, sidewalks, etc., and to all water, sewer, gas, telephone, electric lines, and other utilities thereof, and to all other public or private property along or adjacent to the Work. The Contractor shall notify the proper representatives of any public service corporation, any company, or any individual not less than twenty-four (24) hours in advance of any Work which might damage or interfere with the operation of their property, along or adjacent to the Work. The Contractor shall be responsible for all damage or injury to property of any character resulting from any act, omission, neglect, or misconduct in the manner or method of executing the Work or due to his non-execution of the Work or at anytime due to defective work or materials.
- B. The Contractor shall be responsible for the preservation of all public and private property, and shall protect carefully from disturbance or damage all monument and property marks until the Engineer has witnessed or otherwise referenced their location and shall not move them until directed by the Engineer.
- C. When and where any direct or indirect damage or injury is done to public or private property on account of any act, omission, neglect, or misconduct in the execution of the Work or in consequence of the non-execution

thereof on the part of the Contractor, he shall restore, at his expense, such property to a condition equal to or better than that existing before such damage or injury occurred, by repairing, rebuilding, or otherwise restoring as may be directed by the Engineer, or the Contractor shall make good such damage or injury in a manner acceptable to the injured property owner.

1.10 RESPONSIBILITY FOR DAMAGE CLAIMS

- A. The Contractor shall indemnify and save harmless the Engineer and the Owner and their officers and employees from all suits, actions, or claims of any character brought because of any injuries or damage received or sustained by any person, persons, or property on account of the operations of the Contractor; or on account or in consequence of any neglect in safeguarding the Work; or through use of unacceptable materials in constructing the work; or because of any act, omission, neglect, or misconduct of said Contractor; or because of any claims or amounts recovered from any infringements of patent, trademark, or copyright; or from any claims or amounts arising or recovered under the "Workmen's Compensation Act", or any other law, ordinance, order, or decree. Money due the Contractor under and by virtue of this Contract as may be considered necessary by the Owner for such purpose, may be retained for the use of the Owner or, in case no money is due, his surety may be held until such suit or suits, action or actions, claim or claims for injuries or damages as aforesaid shall have been settled and suitable evidence to that effect furnished to the Owner, except the money due the Contractor will not withheld when the Contractor produces satisfactory evidence that he is adequately protected by public liability and property damage insurance.
- B. The Owner shall not be liable to the Contractor damages or delays resulting from work by third parties or by injunctions or other restraining orders obtained by third parties, except that time will not be charged during such delays, as provided in Section 01015 - Prosecution and Progress.

1.11 THIRD PARTY BENEFICIARY CLAUSE

- A. It is specifically agreed between the parties executing the Contract that it is not intended by any of the provisions of any part of the Contract to create the public or any member thereof a third party beneficiary or to authorize anyone not a party to the Contract to maintain a suit for personal injuries or property damage pursuant to the terms or provisions of the Contract.

1.12 USE OF A SECTION OR PORTION OF THE WORK

- A. Whenever, in the opinion of the Engineer, any portion of the Work or structure is in suitable condition, it may be put into use upon the written order of the Engineer and such usage shall not be held to be in anyway an

acceptance of the Work or structure or any part thereof as a waiver of any of the provisions of these Specifications or Contract. Pending final completion and acceptance of the Work, all necessary repairs and renewals of any section of the Work so put into use, due to defective material or workmanship, to natural causes other than ordinary wear and tear or the operation of the Contractor shall be performed by, and at the expense of the Contractor. Warranty on equipment and structures shall begin on the date of final acceptance of the Work by the Owner. Use or occupancy by the Owner will not constitute a waiver of the requirement in the preceding sentence.

1.13 PRIVILEGES OF THE CONTRACTOR IN STREETS, ALLEYS, AND RIGHTS-OF-WAY

- A. For the performance of the contract, the Contractor will be permitted to occupy such portions of the public property as will not unduly restrict traffic or endanger the public. Contractor will insure that such occupancy of public property shall be in accordance with traffic control plans developed for the project.

1.14 RAILWAY AND HIGHWAY CROSSINGS

- A. Where the Work encroaches upon the right-of-way of any railway, public highway or other public utility, the Owner will obtain all easements or authority necessary to enter upon such right-of-way for the prosecution and completion of the Work; but the Contractor shall make all arrangements with the owner of the right-of-way for the actual construction work and shall perform the work on or across the right-of-way in the manner and at the times agreed upon with the right-of-way owner, and shall pay the costs thereof, including the costs, if any, of temporary construction performed by the right-of-way owner as a means of providing safe and continuous operation of its facilities during the construction period. The Contractor shall take the extra precautions for the safety of Work, the right-of-way facilities and the general public as may be necessary, by sheeting, bracing, and thoroughly supporting the side of any excavation and supporting and protecting any adjacent structures.
- B. Where required by any railway or highway owner, the Contractor shall post with the Owner thereof such bonds or insurance as may be required to guarantee the satisfactory replacement or repair of materials, paving, or grading within the right-of-way thereof.

1.15 PERSONAL LIABILITY OF PUBLIC OFFICIALS

- A. In carrying out any of the contract provisions or in exercising any power or authority granted to him by this Contract, there shall be no liability upon the Engineer, his authorized representative, or any official of the Owner, either personally or as an official of the Owner. It is understood

that in such matters they act solely as agents and representatives of the Owner.

1.16 NO WAIVER OF LEGAL RIGHTS

- A. Upon completion of the Work, the Owner will expeditiously make final inspection and notify the Contractor of final acceptance. Such final acceptance, however, shall not preclude the Owner from correcting any measurement, estimate, or certificate made before or after completion of the Work, nor shall the Owner be precluded from recovering from the Contractor or his surety, or both, such overpayment as may be sustained by failure on the part of the Contractor to fulfill his obligations under the Contract. A waiver on the part of the Owner of any breach of any part of the Contract shall not be held to be a waiver of any other subsequent breach.
- B. The Contractor, without prejudice to the terms of the Contract, shall be liable to the Owner for latent defects, fraud, or such gross mistakes as may amount to fraud, or as regards the Owner's rights under any warranty or guaranty.

1.17 ENVIRONMENTAL PROTECTION

- A. The Contractor shall comply with all Federal, State, and Local law regulations controlling pollution of the environment. He shall take necessary precautions to prevent pollution of streams, lakes, ponds, and reservoirs with fuels, oils, bitumen, chemicals, or other harmful materials and to prevent pollution of the atmosphere.

1.18 ARCHAEOLOGICAL AND HISTORICAL FINDINGS

- A. Should the Contractor encounter, during his operations, any building, part of a building, structure, or object which appears to be of historic archaeological significance, he shall immediately cease operations in that location and notify the Engineer. The Engineer will immediately investigate the Contractor's findings and will direct the Contractor to either resume his operations or to suspend operations as directed.
- B. Should the Engineer order suspension of the Contractor's operations in order to protect an archaeological or historical finding, or order the Contractor to perform extra work, such shall be covered by an appropriate Contract modification (change order) as provided in Section 01028 - Change Order Procedures.

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

Not Applicable

****END OF SECTION****

SECTION 01510
TEMPORARY UTILITIES

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Furnish, install and maintain temporary utilities required for construction, remove on completion of work.
- B. Related Requirements specified in other sections:
 - 1. Summary of work: Section 01010
 - 2. Field Offices and Sheds: Section 01590

1.02 REQUIREMENTS OF REGULATORY AGENCIES

- A. Comply with National Electric Code.
- B. Comply with Federal, State and local codes and regulations and with utility company requirements.

PART 2 - PRODUCTS

2.01 MATERIALS, GENERAL

- A. Materials may be new or used, but must be adequate in capacity for the required usage, must not create unsafe conditions, and must not violate requirements of applicable codes and standards.

2.02 TEMPORARY ELECTRICITY AND LIGHTING

- A. Contractor shall arrange with utility company, provide service required for power and lighting, and pay all costs for service and for power used.
- B. Contractor shall provide adequate artificial lighting for all areas of work when natural light is not adequate for work, and for areas accessible to the public.

2.03 TEMPORARY HEAT AND VENTILATION

- A. Provide temporary heat and ventilation as required to maintain adequate environmental conditions to facilitate progress of the work, to meet specified minimum conditions for the installation of materials, and to protect materials and finishes from damage due to temperature or humidity.
- B. Provide adequate forced ventilation for enclosed areas for curing of installed materials, to disperse humidity, and to prevent hazardous accumulations of dust, fumes, vapors, or

gases.

C. Portable heaters shall be standard approved units complete with controls.

D. Pay all costs of installation, maintenance, operation and removal, and for fuel consumed.

2.04 TEMPORARY TELEPHONE SERVICE

A. Arrange with local telephone service company, provide direct line telephone service at the construction site for the use of personnel and employees. Service required:

1. One direct line instrument in Field Office.
2. One direct line instrument in Owner's representative's office.
3. Other instruments at the option of the Contractor, or as required by regulations.
4. One fax machine for sending and receiving necessary information about the project.

B. Pay all costs for installation, maintenance and removal, and service charges for local calls. Toll charges shall be paid by the party who places the call.

2.05 TEMPORARY WATER

A. Arrange with the Owner to provide metered water for construction purposes, pay all cost associated for installation, maintenance and removal of the temporary water.

2.06 TEMPORARY SANITARY FACILITIES

A. Provide sanitary facilities in compliance with laws and regulations.

B. Service, clean and maintain facilities and enclosures.

PART 3 - EXECUTION

3.01 GENERAL

A. Comply with applicable requirements specified in Division 15 - Mechanical, and in Division 16 - Electrical.

B. Maintain and operate systems to assure continuous service.

C. Modify and extend system as work progress requires.

3.02 REMOVAL

A. Completely remove temporary materials and equipment when their use is no longer required.

B. Clean and repair damage caused by temporary installations or use of temporary facilities.

****END OF SECTION****

SECTION 01590
FIELD OFFICES AND SHEDS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Furnish, install and maintain temporary field offices during the entire construction period.
- B. Furnish, install and maintain storage and work sheds needed for construction.
- C. At completion of work, remove field offices, sheds and contents.
- D. Related requirements specified in other sections:
 - 1. Temporary utilities: Section 01510.

1.02 REQUIREMENTS OF REGULATORY AGENCIES

- A. Comply with requirements of Federal, State and local codes and regulations.

1.03 OTHER REQUIREMENTS

- A. Prior to installation of offices and sheds, consult with Engineer on location, access and related facilities.

1.04 REQUIREMENTS FOR FACILITIES

- A. Construction:
 - 1. Structurally sound, weathertight, with floors raised above ground.
 - 2. Temperature transmission resistance: compatible with occupancy and storage requirements.
 - 3. At Contractor's option, portable or mobile buildings may be used.
- B. Storage Sheds:
 - 1. To requirements of the various trades.
 - 2. Dimensions: Adequate for storage and handling of products.
 - 3. Ventilation: Comply with specified and code requirements for the products stored.
 - 4. Heating: Adequate to maintain required temperatures for the products stored.

PART 2 - PRODUCTS

2.01 MATERIALS, EQUIPMENT, FURNISHINGS

- A. May be new or used, but must be serviceable, adequate for the required purpose, and must not violate applicable codes or regulations.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Fill and grade sites for temporary structures to provide surface drainage.

3.02 INSTALLATION

- A. Construct temporary field offices and storage sheds on proper foundations, provide connections for utility services.
 - 1. Secure portable or mobile buildings when used.
 - 2. Provide steps and landings at entrance doors.
- B. Mount thermometer at convenient outside location, not in direct sunlight.
- C. Mount a rain gauge at convenient location for accurate rainfall data.

3.03 MAINTENANCE AND CLEANING

- A. Provide periodic maintenance and cleaning for temporary structures, furnishings, equipment and services.

3.04 REMOVAL

- A. Remove temporary field offices, contents and services at a time they are no longer needed.
- B. Remove storage sheds when they are no longer needed.
- C. Remove foundations and debris; grade the site to required elevations and clean the area.

****END OF SECTION****

SECTION 01600

MATERIALS AND EQUIPMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Products
- B. Transportation and Handling
- C. Delivery
- D. Product Handling
- E. Storage of Material

1.02 RELATED SECTIONS

- A. Section 01450 - Quality Control

1.03 PRODUCTS

- A. Products shall include the means, materials, equipment, or systems forming Work as approved by the Engineer. Products will not include machinery and equipment used for preparation, fabrication, conveying, and installation of Work. Products may also include existing materials or components designated for reuse.
- B. The Contractor shall not reuse materials and equipment designated to be removed except as approved by the Engineer or specified in the Contract Documents.

1.04 TRANSPORTATION AND HANDLING

- A. The Contractor shall transport and handle products in accordance with manufacturers' instructions.
- B. The Contractor shall promptly inspect shipments to ensure that the products comply with requirements, quantities are correct, and products are undamaged.
- C. The Contractor shall provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.
- D. The Contractor shall arrange for transportation, delivery, and handling of equipment and materials required for timely completion of the Work.

1.05 DELIVERY

- A. The Contractor shall arrange deliveries of products to accommodate the short-term site completion schedules and in ample time to facilitate inspection prior to installation. The Contractor shall avoid deliveries that cause lengthy storage or overburden of limited storage space.
- B. The Contractor shall coordinate deliveries to avoid conflict with Work and conditions at the site and to accommodate the following:
 - 1. Work of other contractors or the Owner.
 - 2. Limitation of storage space
 - 3. Availability of equipment and personnel for handling products.
 - 4. Owner's use of premises.
- C. The Contractor shall have products delivered to the site in manufacturers' original, unopened, labeled containers.
- D. Immediately upon delivery, the Contractor shall inspect shipment to ensure that:
 - 1. The product complies with requirement of Contract Documents
 - 2. Quantities are correct.
 - 3. Container and packages are intact and labels are legible.
 - 4. Products are properly protected and undamaged.

1.06 PRODUCT HANDLING

- A. The Contractor shall coordinate the off-loading of materials and equipment delivered to the job site. If necessary to move stored materials and equipment during construction, the Contractor shall relocate materials and equipment at no additional cost to the Owner.
- B. The Contractor shall provide equipment and personnel necessary to handle products by methods to prevent damage to products or packaging.
- C. The Contractor shall provide additional protection during handling as necessary to prevent breaking, scraping, marring, or otherwise damaging products or surrounding areas.
- D. The Contractor shall handle products by methods to prevent over bending or over stressing.
- E. The Contractor shall lift heavy components only at designated lifting points.

- F. The Contractor shall handle materials and equipment in accordance with Manufacturers' recommendations.
- G. The Contractor shall not drop, roll, or skid products off deliver vehicles. The Contractor shall hand carry or use suitable materials handling equipment.

1.07 STORAGE OF MATERIAL

- A. The Contractor shall store and protect materials in accordance with manufacturers' recommendations and requirements of these Specifications.
- B. The Contractor shall make necessary provisions for safe storage of materials and equipment. The Contractor shall place loose soil materials, and materials to be incorporated into the Work to prevent damage to any part of the Work or existing facilities and to maintain free access at all times to all parts of the Work and to utility service company installations in the vicinity of the Work. The Contractor shall keep material and equipment neatly and compactly stored in locations that will cause a minimum of inconvenience to other contractors, public travel, adjoining owners, tenants, and occupants. The Contractor shall arrange storage in a manner to provide easy access for inspection.
- C. The Contractor shall restrict storage to areas available on the construction site for storage of material and equipment as shown on Plans or as approved by the Engineer.
- D. The Contractor shall provide off-site storage and protection when on-site storage in not adequate.
- E. The Contractor shall not use lawns, grass plots, or other private property for storage purposes without written permission of the property owner or other person in possession or control of such premises.
- F. The Contractor shall protect stored materials and equipment against loss or damage.
- G. The Contractor shall store materials and products in Manufacturers' unopened containers.
- H. Materials delivered and stored along the line of the Work shall be neatly, safely, and compactly stacked along the work site in such a manner as to cause the lease inconvenience and damage to property owners and the general public, and shall not be closer than 3 feet to any fire hydrant. Public and private drives and street crossings shall be kept open.
- I. Damage to lawns, sidewalks streets, or other improvements shall be repaired or replaced by the Contractor to satisfaction of the Engineer and the property owner at no additional cost to the Owner.

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

Not Applicable

****END OF SECTION****

SECTION 01700
CONTRACT CLOSEOUT

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Comply with requirements stated in conditions of the contract and in specifications for administrative procedures in closing out the work.
- B. Related requirements in other parts of the contract documents.
 - 1. Fiscal provisions, legal submittals and additional administrative requirements: Conditions of the Contract.
- C. Related requirements specified in other sections:
 - 1. Operating and Maintenance Data: Section 01730
 - 2. Field Engineering: Section 01050

1.02 SUBSTANTIAL COMPLETION

- A. When contractor considers the work is substantially complete, he shall submit to Engineer:
 - 1. A written notice that the work, or designated portion thereof, is substantially complete.
 - 2. A list of items to be completed or corrected.
- B. Within a reasonable time after receipt of such notice, the Engineer will make a construction review to determine the status of completion.
- C. Should Engineer determine that the work is not substantially complete:
 - 1. Engineer will promptly notify the contractor in writing giving the reasons therefor.
 - 2. Contractor shall remedy the deficiencies in the work, and send a second written notice of substantial completion to the Engineer.
 - 3. Engineer will again review the work for completion status.
- D. When the Engineer finds that the work is substantially complete, he will:
 - 1. Prepare and deliver to Owner a tentative certificate of Substantial Completion with a tentative list of items to be completed or corrected before final payment.

2. After consideration of any objections made by the Owner as provided in conditions of the contract, and when Engineer considers the work substantially complete, he will execute and deliver to the Owner and the Contractor a definite Certificate of Substantial Completion with a revised tentative list of items to be completed or corrected.

1.03 FINAL CONSTRUCTION REVIEW

A. When Contractor considers the work is complete, he shall submit written certification that:

1. Contract documents have been reviewed.
2. Work has been reviewed for substantial compliance with contract documents.
3. Work has been completed generally in accordance with contract documents.
4. Equipment and systems have been tested in the presence of the Owner's representative and are operational.
5. Work is completed and ready for final construction review.

B. Engineer will perform a review to verify the status of completion with reasonable promptness after receipt of such certification.

C. Should Engineer consider that the work is incomplete or defective:

1. Engineer will promptly notify the Contractor in writing, listing the incomplete or defective work.
2. Contractor shall take immediate steps to remedy the stated deficiencies, and send a second written certification to Engineer that the work is complete.
3. Engineer will again review the work.

D. When the Engineer finds that the work is acceptable under the contract documents, he shall request the contractor to make closeout submittals.

1.04 CONTRACTOR'S CLOSEOUT SUBMITTALS TO ENGINEER

A. Operating and maintenance data, instructions to Owner's personnel: To requirements of Section 1730.

B. Spare Parts and Maintenance Materials: To requirements of Section 01730.

C. Evidence of Payment and Release of Liens: To requirements of General and Supplementary Conditions.

- D. Certificate of Insurance for Products and Completed Operation.
- E. Evidence of Payment and Release of Liens: Refer to requirements of General and Supplementary Conditions.
- F. At Contract close-out, legible record construction drawings will be submitted to the Engineer for the Owner containing the following:
 - 1. Depths of various elements of foundation in relation to finish grade.
 - 2. Horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - 3. Location of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.
 - 4. Field changes made by Field Order or by Change Order.
 - 5. Details not on original contract drawings.
 - 6. Record Drawing Data in accord with Section 01050 requirements.

1.05 FINAL ADJUSTMENT OF ACCOUNTS

- A. Submit a final pay request to the Engineer, including final affidavit.
- B. Final Pay Request shall reflect all adjustments to the Contract Sum:
 - 1. The original Contract Sum.
 - 2. Additions and deductions resulting from:
 - a. Previous change orders.
 - b. Allowances.

****END OF SECTION****

SECTION 01720

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Marking Devices
- B. Recording
- C. Submittals

1.02 RELATED SECTIONS

- A. Section 01300 - Submittals
- B. Section 01700 - Contract Closeout

1.03 MAINTENANCE OF DOCUMENTS

- A. The Contractor shall obtain from the Engineer one (1) set of blackline prints of the Contract Plans. These Plans shall be kept and maintained in good condition at the project site and a qualified representative of the Contractor shall enter upon these prints, from day-to-day, the actual "as-built" record of the construction progress. Entries and notations shall be made in a neat and legible manner and these prints shall be delivered to the Engineer upon completion of the construction. Approval for final payment will be contingent upon compliance with this provision.
- B. The Contractor shall maintain a record copy of the following items at the site for the Engineer's review:
 - 1. Specifications and schedules (with modifications noted).
 - 2. Addenda.
 - 3. Change orders and other documents which modify the original documents.
 - 4. Approved shop and erections drawings, product data, and samples including documentation of all submittals transmittals.
 - 5. Records of all changes made during construction.
 - 6. Field test records.
 - 7. Manufacturers' certificates.
 - 8. Equipment Manuals.

9. Inspection certificates.

- C. The Contractor shall maintain documents in a clean, dry, and legible condition.
- D. The Contractor shall not use record documents for construction purposes.
- E. The Contractor shall make documents available at all time for inspection by the Engineer.

1.04 MARKING DEVICES

- A. The Contractor shall provide colored pencil or felt-tip marking pen for all marking.

1.05 RECORDING

- A. The Contractor shall label each document "P R".
- B. The Contractor shall keep record information current with construction progress.
- C. The Contractor shall not permanently conceal any Work until required information has been recorded.
- D. Contract Plans and Shop Drawings shall have each item legibly marked to record actual construction including the following:
 - 1. Actual elevations.
 - 2. Actual horizontal and vertical location of piping, utilities corners, etc. above or below ground. Reference to building exterior lines or other permanent objects. The Contractor shall show direction of flow in pipe and elevation.
 - 3. Field Change of dimensions and detail.
 - 4. Changes made by Contract modification.
 - 5. Added details not on the original Contract.
- E. Each Section of the Specifications and Addenda shall be legibly marked to record the following:
 - 1. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.
 - 2. Other matters not originally specified.

1.06 SUBMITTALS

- F. At Contract Closeout, the Contractor shall deliver Project Record Documents and Samples to the Engineer.
- G. Project Record Documents and Samples shall be accompanied by transmittal letter, in duplicate, containing the following.
 - 1. Date.
 - 2. Project title and number.
 - 3. Contractor's name and address.
 - 4. Title and number of each record document.
 - 5. Certification that each document as submitted is complete and accurate.
 - 6. Signature of Contractor, or authorized representative.
 - 7. Other documents as directed by the Engineer.

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

Not Applicable

****END OF SECTION****

SECTION 01740
WARRANTIES AND BONDS

PART 1 - GENERAL

1.01 PROJECT MAINTENANCE AND WARRANTY

- A. Maintain and keep in good repair improvements covered by these drawings and specifications during the life of the contract.
- B. Indemnify the Owner against any repairs which may become necessary to any part of the work performed and to items of equipment and systems procured for or furnished under this Contract, arising from defective workmanship or materials used therein, for a period of one year after date of Substantial Completion.
- C. The Contractor shall not be obligated to make replacements which become necessary 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 (1) one-year warranty described above, the affected unit shall be disassembled, inspected, and modified or replaced as necessary to prevent further occurrences. All related components, which may have been damaged or rendered non-serviceable as a consequence of the failure, shall be replaced. A new (12) twelve-month warranty against defective or deficient design, workmanship, and materials shall commence on the day that the item is reassembled and placed back into operation. As used herein, multiple failures shall be interpreted to mean (2) two or more successive failures of the same kind in the same item or failures of the same kind in (2) 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 (1) one-year warranty. Should multiple failures occur in a given time, all products of the same size and type shall be disassembled, inspected, modified or replaced, as necessary and rewarranted for (1) one-year.

- E. The Contractor shall, at his own expense, furnish all labor, tools and equipment required and shall make such repairs and removals or shall perform such work or reconstruction as may be made necessary by any structural or functional defect or failure resulting from neglect, faulty workmanship of faculty materials, in any part of the Work performed by him. Such repair shall also include refilling of trenches, excavations or embankments which show settlement or erosion after backfilling or placement.
- F. Except as noted on the Drawings or as specified, all structures such as embankments and fences shall be returned to their original condition prior to the completion of the Contract. Any and all damage to any facility not designated for removal, resulting from the Contractor's operations, shall be promptly repaired by the Contractor at no cost to the Owner.
- G. In the event the Contractor fails to proceed to remedy the defects of which he has been notified within (15) fifteen days of the date of such notice, the Owner reserves the right to cause the required materials to be procured and the work to be done, as described in the drawings and specifications, and to hold the Contractor and the sureties on his bond liable for the cost and expense therefore.
- H. Notice to Contractor for repairs and reconstruction will be made in the form of a registered letter addressed to the Contractor at his home office.
- I. Neither the foregoing paragraphs nor any provision in the Contract Documents, nor any special guarantee time limit implies any limitation of the Contractor's liability with the law of the place of construction.

****END OF SECTION****

SECTION 02110
SITE PREPARATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Site Investigation
- B. Protection
- C. Dust Control
- D. Site Clearing
- E. Removal of Existing Structures and Materials
- F. Topsoil Stripping
- G. Burning of Material on the Work Site
- H. Material Storage and Disposal

1.2 RELATED SECTIONS

- A. Section 01300 - Submittals

1.3 REGULATORY REQUIREMENTS

- A. Conform to applicable code for disposal of debris and burning of debris on site.
- B. Coordinate clearing Work with affected utility companies.

1.4 SUBMITTALS

- A. The Contractor shall submit disposal agreement and release to the Engineer.

1.5 MEASUREMENT AND PAYMENT

- A. Site work shall be considered as an integral part of the Work and no separate measurement or payment shall be made.
- B. No separate measurement and payment for tree fences shall be made, the same being considered incidental to the Work unless a pay item is included in the Bid Proposal Form.

- C. The cost for removing existing structures and materials shall not be measured or paid for directly, but shall be considered incidental to the Work.
- D. Disposal of material resulting from site clearing shall be considered an incidental part of the Work and no separate measurement or payment shall be made.

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

3.1 SITE INVESTIGATION

- A. The Contractor shall verify that existing plant life designated to remain is tagged or identified.
- B. The Contractor shall identify an area for placing removed material and inform the Engineer for his approval.
- C. The Contractor shall make test holes when necessary for locating underground obstructions.

3.2 PROTECTION

- A. The Contractor shall identify the locations of all utilities in the project area.
- B. Where utilities are to be crossed, they shall be uncovered by hand excavation methods before other excavation near them is started. The Contractor shall coordinate all utility locations with the utility owner. Every pipe for water, gas, drainage, or other use, and every conduit, foundation, or other underground structure encountered shall be carefully protected from damage or displacement.
- C. The Contractor shall not remove vegetation which has been marked or identified to be saved by the Engineer. If any vegetation so marked appears to be in conflict with areas to be cleared, the Contractor shall inform the Engineer for his decision.
- D. The Contractor shall protect bench marks and survey control points around the project area.
- E. When directed by the Engineer, the Contractor shall provide fences to protect trees to remain at the Work area.
- F. The Contractor shall be responsible for the prevention and control of soil erosion and gullyng as a result of the construction. The Contractor shall

prevent excessive erosion within the sanitary sewer right-of-way and property immediately adjacent thereto. Ground where the soil has been exposed shall be revegetated with grass. Slopes in channel relocations shall be seeded and fertilized above the water line. Fill slopes shall be provided with adequate slope protection as detailed on the Plans or directed by the Engineer. All soil left within the right-of-way shall be leveled off, dressed out and seeded in a manner that will permit the ground surface to return to a natural state.

- G. Construction operations shall be planned and conducted in such a manner to prevent adverse impact on streams, lakes, and reservoirs with sediment or other harmful material used in the construction of the project. The Contractor shall comply with all regulations of the Environmental Protection Agency.
- H. The discharge ends of all channel relocations shall be aligned to provide direct flow into existing stream beds without an abrupt direction change.

3.3 DUST CONTROL

- A. The Contractor shall control objectionable dust caused by operation of vehicles and equipment in the work area. The Contractor shall apply water or use other methods, subject to approval of the Engineer, to control the amount of dust generated by construction operations.
- B. Work areas inside the Project site shall be broom cleaned and debris removed at the end of each working day. Damp mopping will be performed if required to collect dust. Floors and equipment shall be protected from foot traffic as required with walkway protection.

3.4 SITE CLEARING

- A. Prior to starting construction operations, the Contractor shall remove all vegetable growth, debris, and other objectionable matter standing or lying on the surface within the limits of the areas to be excavated or filled; and shall demolish and remove there from such buildings and other structures as are specifically designated on the Plans for removal.
- B. Clearing shall be performed to provide access and to ensure the safety of employees working at the project area.
- C. The Contractor shall remove trees and plants in a manner to prevent injury to remaining trees, plants, and structures which are to be preserved. All stumps shall be completely removed and disposed of in accordance with the requirements of this section.
- D. The Contractor shall remove undergrowth and deadwood without disturbing subsoil. The Contractor will not be allowed to bury any vegetation or debris.

- E. The Contractor shall saw cut along neat lines for removal of paving, curbs, and gutters as required to perform the Work.

3.5 REMOVAL OF EXISTING STRUCTURES AND MATERIALS

- A. All existing structures encountered within the established lines, grades, or trenching sections shall be removed by the Contractor, unless such existing structures are otherwise specified to be relocated, adjusted up or down, salvaged, abandoned in place, reused in the work, or to remain in place.
- B. Should the Contractor encounter an existing structure (above or below ground) in the work area for which the disposition is not indicated on the Plans, the Engineer shall be notified prior to disturbing such structure. The disposition of existing structures so encountered shall be immediately determined by the Engineer in accordance with the provisions of the Contract.
- C. It is intended that all existing materials or structures that may be encountered (within the lines, grades, or trenching sections established for completion of the Work), be utilized in the Work if they are suitable and acceptable to the Engineer. Such existing materials or structures which are not suitable or acceptable for use in the Work shall be disposed of as specified in this section.

3.6 MATERIAL STORAGE AND DISPOSAL

- A. The Contractor shall stockpile satisfactorily excavated material until required for backfill or fill. The Contractor shall place, grade, and shape stockpiles for proper drainage.
- B. All materials removed during site preparation and by excavation which are suitable for the purpose shall be used whenever practical for backfilling and for such other purposes as may be shown on the Plans or directed by the Engineer. All materials not used for such purposes shall be considered as waste materials and disposed of by the Contractor in an approved manner.
- C. Waste materials may be deposited in spoil banks at locations to be obtained by the Contractor. Such materials shall not be left in unsightly piles, but shall be spread in uniform layers and neatly leveled and shaped to the satisfaction the property owner.
- D. Spoil banks shall be provided with adequate openings to permit surface drainage of adjacent lands.
- E. No waste or surplus materials shall be placed or permitted to be used at points below the flow line of open channels.

- F. The tow of fill slopes will not be allowed to fall within stream or creek channels unless so noted on the plans or directed by the Engineer. No material shall be deposited within the flood plain of any stream in violation of any provision of the Flood Plain Ordinance of Cobb County.
- G. The Contractor shall locate and retain soil materials away from the edge of excavations. The Contractor shall not store soil materials within drip line of trees indicated to remain.
- H. Waste, loose soil, or other materials removed from the manholes shall not be deposited in streams. Depositing material along stream banks where it would be washed away by high stream flows will not be permitted. Surplus material may be deposited only in disposal areas approved by the Engineer.
- I. Depositing material along stream banks where it would be washed away by high stream flows shall not be permitted.
- J. Fuels, oils, bitumen, or other greasy or chemical substances originating from construction operations shall not be allowed to enter or be placed where it may contaminate soil, groundwater, or surface water.
- K. On completion of any part of the Work, proper disposal shall be made of all surplus or unused materials left within the construction limits of such work and the surface of the Work left in a neat and workmanlike condition.
- L. Where materials are to be disposed of on private property, the Contractor shall furnish to the Engineer a copy of a written release signed and approved by the private property owner, allowing the Contractor to dispose of the waste material on that private property, prior to beginning disposal operation.
- M. All waste material resulting from site preparation and excavation activities shall be disposed of in accordance with regulations established by the United States Environmental Protection Agency (EPA), and in a manner approved by the Engineer.

****END OF SECTION****

SECTION 02200

EARTHWORK

1. WORK INCLUDED: Earthwork for this project includes, but is not necessarily limited to:
 - A. Excavation for structures;
 - B. Furnishing and installing graded aggregate base under all concrete slabs on grade;
 - C. Filling and backfilling to attain indicated grades;
 - D. Trenching and trench backfilling;
 - E. Rough and finish grading around structures;
2. RELATED WORK
 - A. Testing laboratory services Section 01410
 - B. Subsurface conditions Section 02010
 - C. Grassing and Mulching Section 02480
3. SITE CONDITIONS

The accuracy of information contained in the plans and specifications as to topography, underground structures, foundation conditions, character of soil, position and quantity of ground and subsoil water, are not guaranteed by the Owner. Bidders must satisfy themselves by personal examination and by such other means as they desire with respect to actual site conditions. Unforeseen conditions shall not constitute a claim for increased compensation under the terms of the contract, nor constitute a basis for the cancellation thereof.
4. JOB CONDITIONS
 - A. Erect sheeting, shoring and bracing as necessary for protection of persons, structures and excavations.
 - B. Provide dewatering and drainage as required to accomplish work.
5. QUALITY ASSURANCE
 - A. Testing Agency

1. In place soil compaction tests to be performed by a testing laboratory employed by the Contractor.
 2. If the compaction does not meet the Specification, the Contractor shall remove the part of embankment not meeting the specifications and replace with properly compacted material and shall pay for all compaction tests made for such defective areas.
- B. Reference Standards
1. ASTM D698-78, Moisture-Density Relations of Soils
 2. ASTM D1556-64, Density of Soil in Place by the Sand-Cone Method.

6. FILL MATERIAL, GENERAL

- A. Fill material shall consist of soil or soil-rock mixture which is free from topsoil, organic matter, and other deleterious substances. Large boulders, thick rock or quartz layers which are not broken down by compaction equipment will not be suitable for use in the fill.
- B. Fill material shall be subject to the approval of the Engineer.

7. TRENCH AND STRUCTURAL BACKFILL

- A. On-site fill material used for trench and structural backfill shall meet the requirements of Article 6 above. Material shall be free of rock or stone larger than two inches.
- B. Granular material when required for trench and structural backfill shall be free from organic substance and other deleterious matter, shall be subject to the approval of the Engineer, and shall be in particle size grading within the following limits:
- (1) Passing the number four sieve: 100%
 - (2) Passing the number 200 sieve: 3% Maximum

8. AGGREGATE BASE UNDER CONCRETE SLAB

Aggregate base under concrete slabs on grade, where shown on the plans, shall be clean mineral aggregate with particle size grading within the following limits:

- (1) Passing the one inch mesh: 100%
- (2) Passing the number four sieve: Not more than 5%

(3) Passing the number 200 sieve: Not more than 1%

9. RIP RAP

The stone used for rip-rap shall meet the requirements of Section 805 of Ga. D.O.T. Specifications, 2001 edition, "Stone for Plain Rip-Rap," and shall have the weight shown on the plans or proposal.

10. NON-SPECIFIED MATERIALS

All other materials, not specifically described but required for a complete and proper installation, shall be as selected by the Contractor subject to the approval of the Engineer.

11. GENERAL

- A. Prior to all work of this Section, become thoroughly familiar with the site, the site conditions, and all portions of the work falling within this Section.
- B. Do not allow or cause any of the work performed or installed to be covered up or enclosed by work of this Section prior to all required inspections, tests, and approvals. Should any of the work be so enclosed or covered up before it has been approved, uncover all such work at no additional cost to the Owner.
- C. The Contractor will provide erosion and sediment control as shown on the plans. All erosion control measures taken shall comply with the Manual for Erosion and Sediment Control in Georgia ("the Manual"). The contractor shall periodically inspect and maintain all erosion control devices. Note that ANY statement or requirement of these specifications that conflicts or differs with the latest edition of the Manual for Erosion and Sediment Control in Georgia, the requirements of the Manual shall take precedence and govern the erosion control measures. Also, the requirements of the EPD's GAR 100002 NPDES permit shall govern and control erosion control efforts of the Contractor.

12. EXCAVATION

- A. Excavate to grades shown on the Drawings. Where excavation grades are not shown on the Drawings, excavate as required to accommodate the installation. Extend excavation as required for proper formwork construction.
- B. Backfill and compact all overexcavated areas as specified for fill below, and at no additional cost to the Owner unless so directed by the Engineer in which case the contractor shall be paid the price bid per cubic yard.
- C. Control grading in vicinity of structures to prevent surface water from running into excavated areas.

- D. Where depressions result from, or have resulted from the removal of surface or subsurface obstructions, open the depression to equipment working width and remove all debris and soft material as directed by the Engineer.
- E. Solid rock excavation.
 - 1. Notify the Engineer when rock is encountered and before its removal.
 - 2. Rock excavation shall be defined as solid rock in the original bed, or well defined ledges, or boulders and detached pieces or rock containing more than 1/2 cubic yard of rock each, which require drilling, blasting or the use of jack hammers to remove.
 - 3. Blasting operations shall be conducted in strict accordance with all existing ordinances and regulations, and shall be done by personnel licensed to use explosives. All structures shall be carefully protected and the blast covered by suitable material.
 - 4. Any damage caused by blasting shall be promptly repaired by the Contractor at his own expense. Explosives and other blasting supplies shall be stored in accordance with all state and local laws. Where rock is encountered in pipe trenches, foundation footings, pump pits and other parts of structures, the rock shall be removed to at least 6 inches below the bottom of the pipe, footings, pump pits, and other parts of structures. Then the surface shall be brought back to grade of the bottom of the structure by backfilling in 6" layers with selected material and tamping to the same average density of the undisturbed earth adjacent thereto.

13. TRENCHING

- A. Trench excavation shall be by open cut from the ground surface, unless otherwise called for on the plans or allowed by the Engineer. Not more than 100 feet of trench shall be opened on any line in advance of pipe laying.
- B. Pipe trenches shall be straight and true to grade and in the location shown on the plans. The bottom of the trenches shall be hand dressed so that the pipe has an even bearing on solid undisturbed earth throughout its entire length between bell, or coupling holes.
- C. Bell holes shall be excavated at all pipe joints for bell and spigot and mechanical joint pipe. Bell holes shall be large enough to facilitate the proper installation of all joints. No part of the pipe bell or coupling shall be in contact with sides or bottom of the trench.

- D. All trenches shall be of sufficient width to provide ample working space on each side of the pipe for maintaining a straight line of pipe.
- E. Water lines shall be laid at the elevations indicated. At points of interference with storm sewers and cross drains, pipe will be run under the conflicting utility.

14. FILL UNDER STRUCTURES

- A. Prior to placing any fill material, the subgrade shall be proof-rolled in the presence of the Engineer. Any unstable areas shall be repaired and the placing of fill materials shall proceed only after inspection and approval by the Engineer.
- B. Approval of the fill material by the Engineer shall be required prior to initiating filling operations.
- C. No fill shall be placed or compacted in a frozen condition or on top of frozen material. No fill material shall be placed when free water is standing on the surface of the area where the fill is to be placed and no compaction of fill will be permitted with free water on any point of the surface of the fill to be compacted.
- D. Scarify existing surfaces to provide bond with new material.
- E. Place fill and backfill in layers not exceeding six inches before compaction and thoroughly tamp with a sheepsfoot roller unless other wise indicated or specified. Compact to a density of not less than 95% of the maximum laboratory dry density, as determined by ASTM D698. The final two 6" lifts that brings the backfill to sub-grade shall be compacted to 98% of the maximum laboratory dry density, as determined by ASTM 0698. If necessary, in order to obtain the required compaction, the Contractor shall add moisture or shall air dry the material. Each lift must be tested and passed the required compaction before backfill operations are continued.
- F. Stones in earth fill must be well distributed and no stones over four inches in diameter may be left within 36 inches of finished grade.

15. BACKFILLING AROUND STRUCTURES

- A. Backfilling around structures shall not proceed until authorized by the Engineer.
- B. All formwork, debris and other undesirable material shall be removed prior to backfilling. Area shall be dewatered.
- C. Backfill material shall be as specified in this section. Backfill shall be placed in layers of 6 inches maximum and shall be of a moisture content which will permit proper compaction. Each layer shall be compacted by mechanical tampers and special care shall be taken to prevent uneven loading or damage to the structure.

- D. Compact backfill material to a minimum relative density of 95% as determined by ASTM D698 (Standard Proctor).

16. BACKFILLING TRENCHES

- A. The backfilling of pipe trenches shall be started immediately after the pipe installation has been approved by the engineer.
- B. Backfill material shall be as specified in this section. The material shall contain no rock greater than two inches in maximum dimension.
- C. Backfill shall be tamped in layers not over 6 inches thick. Tamping shall be done with mechanical tamps in such a manner as to thoroughly compact the backfill without moving or injuring the pipe. The remainder of the backfill may be placed in the trench by a machine, but the backfill shall be compacted to the top of the trench, either by pneumatic hand tamps, hydro-tamps, or other approved methods. After compaction, the dry weight per cubic foot shall be at least 95 percent of the maximum laboratory dry weight per cubic foot as determined by ASTM D698. The trench shall be backfilled and the surface brought to its original grade and profile contour.
- D. In rock excavation, the backfill from the bottom of the trench to one foot above the top of the pipe shall be finely pulverized soil, free from rocks and stones. The rest of the backfill shall not contain over 75% broken stone, and the maximum sized stone placed in the trench shall not have a weight exceeding 50 pounds. Excess rock and fragments of rock weighing more than 50 pounds shall be loaded and hauled to disposal as directed by the Engineer.

17. FINISH GRADING

- A. The contractor shall employ a competent person to interpret elevations and grading details shown on plans.
- B. Areas to be grassed shall be spread with selected topsoil that has been obtained from site clearing. The topsoil shall be mixed into the surface and compacted suitably for planting.
- C. Areas around buildings and structures shall be graded so as to prevent accumulation of water within the area.

18. TEMPORARY EROSION CONTROL

- A. The Contractor will provide erosion and sediment control as shown on the plans. All erosion control measures taken shall comply with the Manual for Erosion and Sediment Control in Georgia (“the Manual”). The contractor shall periodically

inspect and maintain all erosion control devices. Note that ANY statement or requirement of these specifications that conflicts or differs with the latest edition of the Manual for Erosion and Sediment Control in Georgia, the requirements of the Manual shall take precedence and govern the erosion control measures. Also, the requirements of the EPD's GAR 100002 NPDES permit shall govern and control erosion control efforts of the Contractor.

19. DISPOSAL OF EXCESS MATERIAL

- A. Excess material may be disposed of on site in areas selected by the Contractor and approved by the Engineer.
- B. Disposal sites shall be cleared and grubbed and topsoil stockpiled as required in Section 02100.
- C. Disposal sites shall be graded to be free draining, with side slopes no greater than 3:1, and to fit the existing topography.
- D. Upon completion of work at the disposal sites, the areas shall be finish graded as required in this section and grassed and mulching as required in section 02600.

20. GROUND WATER

Control of ground water shall be accomplished in a manner that will preserve the strength of the foundation soils, will not cause instability of the excavation slopes, and will not result in damage to existing structures. Where necessary to these purposes, the water level shall be lowered in advance of excavation, utilizing wells, well points or similar methods. The water level, as measured in piezometers, shall be maintained a minimum of three feet below the prevailing excavation level. Open pumping with sumps and ditches, if it results in boils, loss of fines, softening of the ground or instability of slopes, will not be permitted. Wells and well points shall be installed with suitable screens and filters so that continuous pumping of fines does not occur. The discharge shall be arranged to facilitate collection of samples by the Engineer. Silt collection bags shall be installed and utilized to prevent the loss of silt into state waters.

****END OF SECTION****

SECTION 02210

SOIL EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. The contractor is responsible for implementing best management practices to prevent and minimize erosion and resultant sedimentation in all cleared and grubbed areas during and after construction. This Section covers the work necessary for the installation of structures and measures for the prevention and control of soil erosion. The CONTRACTOR shall furnish all material, labor and equipment necessary for the proper installation, maintenance, inspection, monitoring, reporting and removal (where applicable) of erosion prevention and control measures.

1.02 RELATED SECTIONS

- A. N/A

1.03 REFERENCES

- A. CONTRACTOR shall be familiar with the following reference documents and keep those at the construction site at all times. These documents need to be complied with as applicable.
 1. Manual for Erosion and Sediment Control in Georgia (the "Green Book"), Latest Edition.
 2. State of Georgia Department of Transportation Standard Specifications, Construction of Roads and Bridges, (the GDOT Specifications).
 3. National Stone Association, Aggregate Classification (the NSA Classification).
 4. Erosion, Sedimentation and Pollution Control Plan (the Plan) as required by the NPDES Permit.

1.04 DEFINITIONS

- A. ENGINEER: For the purposes of this Section 02210, the term ENGINEER is synonymous with consulting engineer, licensed professional, designer, and consultant as used in permits, laws, rules, regulations, ordinances and other soil erosion and sediment control references. For the purposes of this Section 02210, the Marietta Board of Lights and Water representative may at any time during the project

provide direction. This direction shall be considered equivalent to direction from the ENGINEER.

- B. CONTRACTOR: For purposes of this Section 02210, the term CONTRACTOR is synonymous with general contractor, discharger, operator, primary permittee and permittee (permit holder) as used in permits, laws, rules, regulations, ordinances and other soil erosion and sediment control references.
- C. Qualified Personnel: For purposes of this Section 02210, the term Qualified Personnel means a person who has successfully completed an erosion and sediment control short course eligible for continuing education units, or an equivalent course approved by Environmental Protection Division of the Georgia Department of Natural Resources and the State Soil and Water Conservation Commission.

1.05 REGULATORY COMPLIANCE

- A. Land disturbance activities are not authorized to begin until after all required erosion and sediment control permits are obtained from the United States, the State of Georgia, Cobb County and/or the City of Marietta. CONTRACTOR shall comply with requirements specified in the Contract Documents or by the ENGINEER. CONTRACTOR shall also comply with all other laws, rules, regulations, ordinances and requirements concerning soil erosion and sediment control established by the United States, the State of Georgia, and/or Cobb County. The following documents and the documents referenced therein define the regulatory requirements for this Section 02210.
 - 1. Manual for Erosion and Sediment Control: CONTRACTOR shall follow practices and standards of the Georgia Soil and Water Conservation Commission Manual for Erosion and Sediment Control in Georgia
 - 2. Comprehensive Monitoring Plan: When a Comprehensive Monitoring Plan (CMP) is provided in the Contract Documents, CONTRACTOR shall follow the practices described in the CMP.

1.06 SUBMITTALS

- A. CONTRACTOR shall submit to the ENGINEER the proposed schedule for installation, maintenance and removal of all temporary and permanent erosion and sediment control measures. The schedule shall reflect the requirements of Paragraph 1.07 below (Sequence of Construction of Temporary Sediment Control Structures) and must show the anticipated starting and completion date for all land development activities including:
 - 1. Installation of temporary and permanent sediment control structures

2. Stormwater management facilities,
3. Timber salvage operations,
4. Clearing operations,
5. Grubbing operations,
6. Rough and finished grading,
7. Building construction,
8. Landscaping, including all seeding and sodding, and
9. Removal of temporary sediment control structures.

1.07 SEQUENCE OF CONSTRUCTION OF TEMPORARY SEDIMENT CONTROL MEASURES

- A. Install all erosion and sediment control structures specified herein and shown in the Contract Documents, or as directed by the ENGINEER, as the first item of work within a given drainage area. Construction and installation of all sediment control structures shall begin downgradient of the area to be disturbed and proceed upgradient. CONTRACTOR shall at all times maintain all soil erosion and sediment control structures and practices throughout construction and until permanent grass cover is established.

1.08 PAYMENT PROCEDURES

- A. The price bid for work covered under this Section 02210 shall include the furnishing, placement, maintenance, and removal of the silt fence, hay bales, temporary dikes and ditches, sediment traps, sediment basins, construction exits and all temporary vegetative and non-vegetative ground cover and all earthwork, labor, materials, and equipment necessary to complete the work as specified or directed by ENGINEER.

PART 2 - SPECIFIC REQUIREMENTS

- A. The requirements specified herein and shown in the Contract Documents are minimum requirements for preventing or minimizing soil erosion and sediment transport. CONTRACTOR shall install and maintain soil erosion and sediment control measures in accordance with the following criteria. Requirements set forth in the Manual for Erosion and Sediment Control in Georgia shall govern in case of a conflicting information, unless clearly identified as a deviation from this Manual.

2.01 TEMPORARY INTERCEPTOR, DIVERSION, AND PERIMETER DIKES

- A. Install interceptor, diversion and perimeter dikes to intercept and prevent storm water runoff from entering disturbed areas from any other upgradient area regardless of whether area is on-site or off-site. Dikes must divert runoff to a drainage ditch, sediment basin or temporary or permanent channel. Dikes shall remain in place until the disturbed area is permanently stabilized. Construct dikes of earth fill free from all perishable matter and refuse, such as scraps of forms, wire, brush, rocks larger than six (6) inches or any foreign materials. Ashes, large stones, muck or other soft materials shall not be used. Compact all dikes using construction equipment. Dikes shall be stabilized immediately after construction with temporary seeding in accordance with Paragraph 2.09 to prevent sediment transport to downstream areas.

2.02 TEMPORARY INTERCEPTOR, DIVERSION, AND PERIMETER DITCHES

- A. Install temporary ditches where shown on the Drawings or as directed by the ENGINEER. In general, temporary ditches shall be installed parallel and contiguous to and upslope of temporary dikes. Construct ditches to the lines and cross section shown on the drawings, provided that ditches have a minimum depth of one foot and side slopes have a slope of 2H:1V or flatter. Ditches shall be free of bank projections, trees, brush, stumps or other objectionable materials or irregularities that will impede normal flows. Downstream outlets of temporary ditches shall be constructed and stabilized prior to construction of the ditch. The outlet must discharge in such a manner as to not cause an erosion problem.

2.03 TEMPORARY SEDIMENT BARRIERS (SILT FENCE)

Install silt fence where shown on the Drawings or as directed by the ENGINEER.

- A. Material Specifications: Filter fabric must meet the requirements set forth in Section 171 - Temporary Silt Fence, of the State of Georgia Department of Transportation (DOT) Standard Specifications, Construction of Roads and Bridges. CONTRACTOR shall submit to ENGINEER copies of delivery invoices, certifications or other documentation that the filter fabric complies with these specifications if requested by ENGINEER.
- B. Installation: In general, silt fencing shall be installed on the downgradient side of all areas to be disturbed as well as the perimeter of the project site (ENGINEER may authorize an exception for a perimeter which is upgradient from all land disturbing activity). All posts used to install silt fence shall comply with the specifications in the Manual for Erosion and Sediment Control in Georgia. Posts must be placed at least 18 inches in the ground and cannot be more than 6 feet apart from one another. Fence fabric must be inserted below ground and fence fabric must be fastened to posts according to the specifications in the Manual.

- C. Maintenance: In accordance with Paragraph 3.01 below, all silt fencing shall be inspected and maintenance performed, if needed, within 24 hours of inspection once every seven (7) calendar days and within 24 hours of a rainfall event that has precipitation of 0.5 inches or greater. All silt fencing materials, including fabric, posts and fasteners must be replaced six months after installation. At the earlier of (1) every 14 calendar days, or (2) when sediment reaches a depth of one half the installed fence height, all soil, silt, sediment and other material captured by the silt fence should be removed and returned upgradient on the construction site. The silt fence shall maintain such that it minimizes sediment transport as designed.

2.04 TEMPORARY SEDIMENT BARRIERS (HAY BALES)

Install bales of hay where shown on the Drawings or as directed by ENGINEER.

- A. Material Specifications: Hay bales shall be wire or nylon bound and of a rectangular shape.
- B. Installation: Place bales in a row with ends tightly abutting the adjacent bales. Corner abutment is not acceptable. Embed bales in the soil a minimum of four (4) inches below grade. Build up backfilled soil a minimum of four (4) inches above grade on the uphill side of the barrier and conform to grade on the downhill side of the barrier. Anchor each bale in place with 1- by 2-inch wood stakes or No. three (3) reinforcing bars. The first stakes shall be driven toward the previously laid bale to force the bales together. Stakes shall be 24 inches long and shall reach a minimum of six (6) inches into the ground.
- C. Maintenance: In accordance with Paragraph 3.01 below, all hay bales shall be inspected and maintenance performed, if needed, within 24 hours of inspection once every seven (7) calendar days and within 24 hours of a rainfall event that has precipitation of ½ inch or greater. Hay bales must be replaced one month after installation. At the earlier of (1) every 14 calendar days or (2) when sediment reaches a depth of one-half the original bale height, all soil, silt, sediment and other material captured by the hay bales should be removed and returned upgradient on the construction site. The hay bales shall be maintained such that they minimize sediment transport as designed.

2.05 CONSTRUCTION EXIT

Locate construction exits as shown on the Drawings or as directed by the ENGINEER.

- A. Material Specifications: A geotextile underliner, conforming to Section 881.06 - Plastic Filter Fabric of the State of Georgia DOT Standard Specifications, Construction of Roads and Bridges, shall be used in all instances to stabilize and support the pad aggregate. Aggregate size will

conform to the National Stone Association's (NSA) R-2 classification 1½-inch to 3½-inch stone).

- B. Installation: Construction exits should be located at all points where traffic will be leaving the construction site to a public or private right of way, street, alley, or parking area. All construction exits must be fully installed prior to the commencement of timber salvage, clearing, grubbing, grading or construction operations.
- C. Maintenance: In accordance with Paragraph 3.01 below, all construction exits shall be inspected and maintenance performed, if needed, within 24 hours of inspection once every seven (7) calendar days and within 24 hours of rainfall event that has precipitation of 0.5 inches or greater. At the earlier of (1) thirty calendar days since construction exit was installed or last maintained, or (2) geotextile underliner is visible or if construction exit does not conform to specifications established in this Paragraph 2.05, construction exit pad shall be top dressed with NSA's R-2 (1½-inch to 3½-inch stone) such that underliner is no longer visible and exit pad conforms to specifications.

2.06 CHECK DAM

Install check dams as shown on the Drawings or as directed by the ENGINEER.

- A. Installation: Install check dams in all ditches, channels or swales draining disturbed areas of one (1) acre or greater and which are not installed with permanent, non-erodible lining or a vegetative cover as specified in Paragraph 2.09. The specifications for the design criteria, materials, installation and maintenance of check dams are dependent on the upslope drainage area and are described below. A check dam shall not drain a disturbed area greater than ten (10) acres.
 - 1. Check Dam for Ditches Draining Up To Two (2) Acres: Hay bales may be used if all bales used conform to the specifications established in Paragraph 2.04.
 - 2. Check Dam For Ditches Draining Up To Five (5) Acres: Install stone check dams in ditches draining upgradient areas greater than two acres. Construct check dam with graded size 5- to 10-inch stone. Hand placement may be required to insure complete coverage of entire width of ditch.
 - 3. Check Dam For Ditches Draining Five (5) to Ten (10) Acres: Check dams for use with drainage areas between five and ten acres must serve as a sediment filtering device in addition to reducing the velocity of storm water runoff. Construct check dam with graded size 5- to 10-inch stone. Check dam shall not substantially impound water. Hand placement may be required to ensure complete coverage of entire width of ditch.

- B. Maintenance: In accordance with Paragraph 3.01 below, all check dams shall be inspected and maintenance performed, if needed, within 24 hours of inspection once every seven (7) calendar days and within 24 hours of a rainfall event that has precipitation of 0.5 inches or greater. Dress dams with appropriate-sized stone or additional hay bales as is necessary to maintain check dams in accordance with these specifications. At the earlier of (1) every 14 calendar days, or (2) when sediment reaches a depth of one-half the original check dam height, all soil, silt, sediment and other material captured by the dam should be removed and returned upgradient on the construction site.

2.07 INLET SEDIMENT TRAP

Install inlet sediment traps where shown on the Drawings, as directed by ENGINEER, and around all storm drain drop inlets that receive runoff from disturbed areas.

- A. Material Specifications: Filter fabric used in constructing inlet sediment traps shall conform to the specifications established in Paragraph 2.03. For gravel drop inlet filters, stone shall conform to NSA's R-3 specification (3- to 6-inch stone). Baffle box inlet filters shall be constructed of 2-inch x 4-inch or 4-inch x 4-inch posts and 2-inch x 4-inch boards.
- B. Installation: Install in accordance with Chapter Six of the Manual for Erosion and Sediment Control in Georgia. Excavation may only be used in combination with a filtering device such as stone or silt fence. All sediment traps should provide a minimum of 1.5 feet of sediment storage. Sediment traps must be self-draining.
- C. Maintenance: In accordance with Paragraph 3.01, inlet sediment traps shall be inspected and maintenance performed, if needed, within 24 hours of inspection once every seven (7) calendar days and within 24 hours of a rainfall event that has precipitation of 0.5 inches or greater. Clean and repair traps such that traps meet the specifications of this Paragraph 2.07 and minimize sediment transport. Remove sediment as necessary to provide adequate storage volume for subsequent rains.

2.08 TEMPORARY SEDIMENT BASINS AND INLETS

Install temporary sediment basins and inlets where shown on the Drawings or as directed by ENGINEER.

- A. Material Specifications: Concrete used in constructing sediment basin shall be ready mixed, conforming to ASTM C 94, Alternate 2. Compressive field strength shall be not less than 2,500 psi at 28 days. Maximum size of aggregate shall be 1-1/2 inch. Slump shall be between 2 and 4 inches. Field strength shall be assumed as equal to 85 percent of the

strength of laboratory-cured cylinders. Forms used in constructing sediment basin shall have exposed surfaces of plywood; others shall be steel, matched boards, plywood, or other acceptable material. Form all vertical surfaces. Provide fillets on reentrant angles. Trench walls, large rock, or earth will not be acceptable form material. Reinforcing steel shall conform to ASTM A 615, Grade 40, deformed bars. At the option of the CONTRACTOR, approved precast units may be substituted for cast-in place units. Precast units shall conform to ASTM C 478. Submit details of proposed units to the ENGINEER for review. Concrete risers for extensions shall be a maximum of 6 inches high and of the same quality as the sections. Risers shall be reviewed by ENGINEER before installation. Mortar shall be standard premixed mortar conforming to ASTM C 387, Type S, or proportion 1 part portland cement to 2 parts clean, well-graded sand which will pass a 1/8-inch screen. Admixtures may be used not exceeding the following percentages of weight of cement: Hydrated lime, 10 percent; diatomaceous earth or other inert materials, 5 percent. Consistency of mortar shall be such that it will readily adhere to the concrete. Cast iron frames and gratings for catch basins and storm drain inlets shall be designed for AASHTO H-20 truck loadings and shall be bike-proof vetriculine grates. Bearing surfaces shall be clean and shall provide uniform contact. Castings shall be tough, close-grained gray iron, sound, smooth, clean, free from blisters, blowholes, shrinkage, cold shunts, and all defects, and shall conform to ASTM A 48, Class 30.

- B. Construction: Excavation of basin and backfill of any adjoining pipe trenches shall be as specified in Section 02200, Earth Excavation. Construct forms to the dimensions and elevations required. Forms shall be tight and well braced. Chamfer corners of forms. Prior to placing the concrete, remove all water and debris from the forms. Moisten forms just prior to placing the concrete. Handle concrete from the transporting vehicle to the forms in a continuous manner as rapidly as practical without segregation or loss of ingredients. Immediately after placing, compact concrete with a mechanical vibrator. Limit the duration of vibration to the time necessary to produce satisfactory consolidation without causing segregation. Screed the top surface of exposed slabs and walls. When the initial water has been absorbed, float the surfaces with a wood float and lightly trowel with a steel trowel to a smooth finish free from marks or irregularities. Finish exposed edges with a steel edging tool. Remove forms and patch any defects in the concrete with mortar mixed in the same proportions as the original concrete mix. Cure concrete by preventing the loss of moisture for a period of 7 days. Accomplish with a membrane-forming curing compound. Apply the curing compound immediately after removal of forms or finishing of the slabs. Protect concrete from damage during the 7-day curing period. If precast unit is used and material in bottom of trench is unsuitable for supporting unit, excavate and backfill to required grade with 3-inch minus, clean, pit-run material. Set units to grade at locations shown. Set frames and gratings at elevations indicated on Drawings. Frames may be cast in, or shall be set in mortar.

- C. Maintenance: In accordance with Paragraph 3.01, temporary sediment basins and inlets shall be inspected and maintenance performed, if needed, within 24 hours of inspection once every seven (7) calendar days and within 24 hours of a rainfall event that has precipitation of 0.5 inches or greater. Clean and repair basins and inlets such that they meet the specifications of this Paragraph 2.08 and minimize sediment transport. Remove sediment as necessary to provide adequate storage volume for subsequent rains.

2.09 TEMPORARY SOIL EROSION STABILIZATION (VEGETATIVE)

This section covers work necessary for temporary stabilization of soil to prevent erosion following clearing, grubbing, grading or other construction activities in the areas identified in the Contract Documents or as directed by the ENGINEER, except wetlands. The right is reserved to modify the use, location, and quantities of the areas requiring stabilization as the ENGINEER consider being in the best interest of the City of Marietta. During construction, the ENGINEER will designate the extent of stabilization used in each location throughout the project.

- A. General Criteria: The stabilization measures specified herein shall be initiated on all disturbed areas including dikes and ditches within 24 hours of completion to minimize erosion and soil transport, provided however, that stabilization measures specified herein do not have to be initiated in the event that construction activities will resume on that portion of the site within fourteen (14) days from the date activities temporarily ceased. For cleared areas which may not receive permanent vegetative or other stabilization measure for six (6) months or less AND a suitable growing season is not available for seedings to establish an erosion retardant cover, mulch may be applied according to the specifications below.
- B. Material Specifications: Seed shall be clean, delivered in original unopened packages and bearing an analysis of the contents. Guaranteed 95 percent pure with minimum germination rate of 85 percent. Summer seed mix shall be 40 percent by weight Fawn Fescue, 30 percent by weight Perennial Ryegrass, 15 percent by weight Orchard Grass, and 15 percent by weight Dutch White Clover. Winter seed mix shall be 35 percent by weight Fawn Fescue, 30 percent by weight Perennial Ryegrass, 30 percent by weight Hairy Vetch, and 5 percent by weight Dutch White Clover. Fertilizer shall be used if directed by ENGINEER. Fertilizer shall be commercial, chemical type, uniform in composition, free-flowing, conforming to state and federal laws, and suitable for application with equipment designed for that purpose. Fertilizer shall have a minimum percentage of plant food by weight for the following: Summer mix shall be 10 percent nitrogen, 10 percent phosphoric acid, and 6 percent potash; Winter mix shall be 16 percent nitrogen, 8 percent phosphoric acid, and zero percent potash. Straw mulch shall be threshed straw of oats, wheat, or rye, free from obnoxious weed seeds or obnoxious weeds, or shall be clean hay. Average stalk length shall be 6 inches. Wood waste, asphaltic emulsion, or erosion control matting such as jute, excelsior, are also

appropriate for temporary stabilization. Asphaltic emulsion shall be CSS-1 as manufactured by Chevron Asphalt Company.

1. CONTRACTOR shall submit to ENGINEER certificates of inspection of seed by state or federal authorities and copies of delivery invoices or other documentation of quantities of mulch and fertilizer.
2. The CONTRACTOR shall give at least three (3) days notice to the ENGINEER of the time and place of starting the following operations:
 - a. Delivery of materials
 - b. Planting of grass
3. The CONTRACTOR shall keep the ENGINEER advised of his schedule of operations.

C. Application: Planting and seeding shall be performed in accordance with the following schedule:

1. Summer Seeding: No earlier than April 1 and no later than October 15.
2. Winter Seeding: October 16 until weather conditions prohibit further construction operations as determined by the ENGINEER.
3. Soil Preparation: Prior to seeding operations, and after surface has been shaped, graded, and compacted, scarify surface to a minimum depth of 1 inch.
4. Seeding: All seedbeds shall be a minimum depth of one (1) inch. Seedbeds shall be reviewed by the ENGINEER prior to seeding. After soil has been scarified, apply required seed mix, as specified in this section, uniformly with a cyclone seeder, drill, cultipacker seeder, or hydroseeder. When hydroseeding is the selected method of seeding, prepare and apply slurry at the rate and proportion specified below:
 - a. Seed Mix 100 lbs/acre
 - b. Fertilizer 650 lbs/acre
 - c. Water as necessary

The required fertilizer mix shall be uniformly applied at the time of seeding.

Upon completion of the seeding operations, apply straw mulch to a reasonably uniform thickness of 1-1/2 inches to 2-1/2 inches in depth. Mulch shall be loose enough to permit penetration of sunlight and air circulation, but dense enough to shade ground, reduce evaporation rate, and prevent or materially reduce erosion of underlying soil. Retain straw in place by applying asphaltic emulsion at a rate of 100 gallons per acre or mechanically tack the mulch into the soil to approximately 3 inches. Equipment used for tacking shall be specially designed for this use.

- D. Application of Mulch Only: In accordance with Paragraph 2.09A, for areas to receive mulch only, apply at the following rates, to the following depths and according to the following specifications:
1. Dry Straw or Hay: Spread at a rate of two and one-half (2 1/2) tons per acre. Apply to a depth of six (6) to ten (10) inches. Apply uniformly and anchor as necessary.
 2. Wood Waste: Spread at a rate of six (6) to nine (9) tons per acre. Apply to a depth of two to three inches. Apply wood waste only on slopes that are 3:1 or flatter. Anchoring is not necessary.
 3. Jute Matting or Excelsior Netting: Apply in accordance with manufacturer's recommendations.
 4. Asphaltic Emulsion: Apply at a rate of 1200 gallons per acre. Apply uniformly.
- E. Maintenance: In accordance with Paragraph 3.01, stabilized areas shall be inspected and maintenance performed, if needed, within 24 hours of inspection once every seven (7) calendar days and within 24 hours of a rainfall event that has precipitation of 0.5 inches or greater. Apply additional stabilization materials as needed.

2.10 EROSION CONTROL MATTING AND BLANKETS

- A. Erosion control matting and blankets shall be applied on steep slopes where the hazard of erosion is high and planting is likely to be too slow to provide adequate cover. Erosion control matting shall be applied in concentrated flow area, slopes 2.5:1 and steeper with a height of ten feet or greater and cuts and fills within stream banks. The choice of the installation of matting or blankets, permanent or temporary shall be dependent on the specific condition of the area to be stabilized and the manufacturers recommendations to obtain maximum erosion control.

PART 3 - EXECUTION

3.01 INSPECTIONS AND MAINTENANCE

- A. CONTRACTOR shall designate a Qualified Person to perform inspections. The following areas are to be inspected and maintenance performed, if needed.
1. Disturbed areas of the construction site that have not undergone final stabilization.
 2. Erosion and sediment control structures.
 3. All locations where vehicles enter or exit the site.
 4. Material storage and construction laydown areas that are exposed to precipitation and have not been finally stabilized.
- B. In areas that have been finally stabilized, inspections and, if necessary, maintenance by CONTRACTOR will occur at least once per month for duration of contract or project, whichever is longer.
- C. During inspections, the following will be observed and appropriate maintenance procedures taken:
1. The conformance to specifications and current condition of all erosion and sediment control structures.
 2. The effectiveness and operational success of all erosion and sediment control measures.
 3. The presence of sediments or other pollutants in stormwater runoff at all runoff discharge points.
 4. If reasonably accessible, the presence of sediments or other pollutants in receiving waters.
 5. Evidence of off-site sediment tracking at all locations where vehicles enter or exit the site.

Silt and erosion control devices shall be inspected by the Contractor for effectiveness, damage and proper installation at the end of each working day not to exceed once every seven (7) calendar days and within 24 hours of the end of a rainfall event that is 0.5 inches or greater. Repair of damage or improper installation shall be remedied by the Contractor within 24 hours of inspection. Improper effectiveness of any silt and erosion control device or combination thereof that has been properly installed and maintained shall be reported to the Engineer within 24 hours of inspection. Silt and erosion control devices shall be cleaned of sediment

as required for the specific device. Disposal of sediment in a fashion that it will not re-enter the silt and erosion control devices. The Contractor shall promptly remedy all damage or improper installation.

3.02 REMOVAL OF TEMPORARY SEDIMENT CONTROL STRUCTURES

- A. At such time that temporary erosion and control structures are no longer required under this Section 02210, the CONTRACTOR shall notify the ENGINEER of its intent and schedule for the removal of the temporary structures, and obtain the ENGINEER's approval in writing prior to removal. Once CONTRACTOR has received such written approval from ENGINEER, CONTRACTOR shall remove as approved the temporary structures and all sediments accumulated at the removed structure shall be returned upgradient. In areas where temporary control structures are removed, the site shall be left in a condition that will restore original drainage.

****END OF SECTION****

SECTION 02270

TEMPORARY SILT FENCE

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Work under this section shall include furnishing, installing, maintaining, and upon satisfactory completion, removing a water permeable filter fabric silt fence complete with posts and miscellaneous hardware.

The quantity of silt fence may be increased or decreased from what is shown on the plans, upon direction of the Engineer or local government authority. Such variations in quantity will not be considered alteration of the scope of the work.

- B. Obtain proper permits from local government before land disturbing activities begin. Silt fence or other erosion control devices shall be installed prior to any land disturbing activities.
- C. Temporary erosion control measures shall control erosion and sedimentation to an extent such that the turbidity of streams immediately downstream of the project shall not have an increase in turbidity of more than 25 Nephelometric turbidity units (NTU).

1.02 RELATED WORK

- A. Grassing and Mulching Section 02486

1.03 SUBMITTALS

- A. Shop drawings and product data as described in Section 01340.

1.04 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect the materials of this Section before, during and after installation.
- B. Storage: The fabric shall be wrapped in a heavy-duty protective coating. The coating shall be capable of protecting the fabric from mud, dust, dirt, debris and sunlight. The fabric shall not be exposed to temperatures exceeding 140 degrees F.
- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Engineer, and at no additional cost to the Owner.

PART 2 - PRODUCT

2.01 FILTER FABRIC

A. General

Filter fabrics shall be composed of strong rot-proof synthetic fibers formed into either woven or non-woven fabric. The fabric shall contain stabilizers and or inhibitors for protection against damage due to exposure to direct sunlight. The fabric shall be of stable construction. Fibers shall maintain their relative position, in the fabric, under normal handling, installation, and service. Edges of the fabric shall be finished to prevent the outer yarn from pulling away from the fabric.

Fabrics shall be free of defects and or flaws, which would affect their physical or filtering properties.

Fabrics may be manufactured with pockets for posts, hems with cord, or with posts pre-attached using staples or button head nails.

The manufacturer shall have either an approved color mark yarn in the fabric, or label the fabric with the company's name at minimum 100-foot intervals.

B. Type A Filter Fabric

Type A filter fabric shall be 36 inches wide. Woven fabric construction shall allow slit tape yarns in one direction (warp or fill) only. The fabric shall meet the following physical and dimensional requirements.

Tensile Strength (ASTM D-4632) Warp.....120 lbs

Tensile Strength (ASTM D-4632) Fill.....100 lbs

Elongation (ASTM D-4632).....40% Max

Apparent Opening Size (ASTM D-4751).....#30

Flow Rate Min.....25 Gal/Min/Ft2

Fabric ultraviolet stability shall conform to ASTM D-4632 after 300 hours weathering in accordance with ASTM D-4355. The fabric bursting strength shall be no less than 175 PSI when tested in accordance with ASTM D-3786 diaphragm bursting strength tester.

C. Type B Filter Fabric

Type B filter fabric shall be 22 inches wide. Type "B" shall meet the same physical requirements as type A listed above, with the exception of width.

D. Type C Filter Fabric

Type C filter fabric shall be 36 inches wide of a non-calendered woven fabric constructed of monofilament yarns or fibrillated yarn textiles only. The fabric shall meet the following physical and dimensional requirements.

Tensile Strength (ASTM D-4632) Warp.....260 lbs

Tensile Strength (ASTM D-4632) Fill.....180 lbs

Elongation (ASTM D-4632).....40% Max

Apparent Opening Size (ASTM D-4751).....#30

Flow Rate Min.....70 Gal/Min/Ft2

Fabric ultraviolet stability shall conform to ASTM D-4632 after 300 hours weathering in accordance with ASTM D-4355. The fabric bursting strength shall be no less than 175 PSI when tested in accordance with ASTM D-3786 diaphragm bursting strength tester.

E. Approved Manufacturers

Manufacturers products must either be on the Georgia Department of Transportation "Qualified Products List (latest version) or have the Engineer's prior approval.

2.02 POSTS AND WOVEN WIRE SUPPORTS

A. Type "A" Fence

Posts shall be a minimum of four (4) feet long and constructed of either wood or steel. Soft wood posts shall be at least three (3) inches in diameter or a nominal two (2) inch by four (4) inch straight enough to provide a fence without noticeable misalignment. Hard wood posts shall be one and one half (1-1/2) inch by one and one half (1-1/2) inch or have a cross sectional area of no less than two point two five (2.25) inches square. Steel posts shall be "U", "T", or "C" shapes with a minimum weight off one point three (1.3) pounds per foot, and have projections for fastening the fence to the posts. The maximum post spacing for Type "A" fencing shall be six (6) feet.

B. Type "B" Fence

Posts shall be a minimum of three (3) feet long and constructed of either wood or steel. Soft wood posts shall be at least two (2) inches in diameter or a nominal two (2) inch by two (2) inch straight enough to provide a fence without noticeable misalignment. Hard wood posts shall be one (1) inch by one (1) inch or have a cross sectional area of no less than one (1)

inch square. Steel posts shall be "U", "T", or "C" shapes with a minimum weight off zero point seven five (0.75) pounds per foot. The maximum post spacing for Type "B" fencing shall be six (6) feet.

C. Type "C" Fence

Posts shall be a minimum of four (4) feet long and constructed of steel. Posts shall be "U", "T", or "C" shapes with a minimum weight off one point three (1.3) pounds per foot, and have projections for fastening the fence to the posts. The maximum post spacing for Type "C" fencing shall be four (4) feet.

Woven wire fence shall be used with Type "C" fence. The wire fence fabric shall be at least 32 inches high and have at least six (6) horizontal wires. Vertical wires shall have a maximum spacing of twelve (12) inches. The top and bottom wires shall be at least ten-(10) gauge and all other wires shall be at least twelve point five-(12.5) gauge.

The filter fabric shall be attached to the top of the woven wire fence at the midpoint between posts.

2.03 FASTENERS FOR WOODEN POSTS

A. Wire Staples

Wire staples shall be 17 gauge minimum, have a crown of at least three fourths (3/4) inch wide and legs at least one half (1/2) inch long. Staples shall be evenly spaced at least five (5) per post for Type "A" fence, four (4) per post for Type "B" fence.

B. Nails

Nails shall be 14-gauge minimum, one (1) inch long with three fourths (3/4) inch button heads. Nails shall be evenly spaced with at least five (5) per post for Type "A" fence, four (4) per post for type "B" fence.

PART 3 - EXECUTION

3.01 GENERAL

The contractor shall install temporary silt fence as shown on the plans specified herein, or as directed by the Engineer.

3.02 INSTALLATION

- A. Excavate a trench to a depth of six (6) inches by mechanical means. Excavate by hand if mechanical excavation is not possible.
- B. Begin post installation at the center of the low point of the fencing run. Space post according to fence type to a depth of at least 18 inches. Where

ground conditions will not allow a depth of 18 inches, secure posts well enough to prevent overturning by sediment loading.

- C. Attach filter fabric to posts by wire, cord, pockets, staples, nails, or other acceptable means. The fabric shall overlap at least 18 inches at all splice joints. The filter fabric shall be attached so that six-(6) inches to eight (8) inches minimum fabric is left at the bottom to be buried.
- D. Install the fabric in the trench with two (2) to (4) inches across the trench bottom in the upstream direction, install the remaining four (4) to six (6) inches against the side of the trench. Backfill and compact so that no flow can pass under the barrier.

3.03 INSPECTION OF SILT FENCING

Upon completion of installation the Engineer or local government authority shall inspect the silt fencing for proper installation, flaws, defects, rips, holes, or other damage that may have occurred. The contractor shall repair or replace the damaged portions as directed by the engineer or local government authority.

3.04 MAINTENANCE OF SILT FENCING

The contractor shall maintain the silt fence until the project is accepted or the fence is removed. Maintenance of the fence shall include; removal and disposal of silt accumulations at the silt fence, replacement of damaged or deteriorated filter fabric, repair or replacement of fence posts, and the installation of additional fencing should the fencing installed prove to be inadequate.

Silt shall be cleaned out once it has accumulated to one half (1/2) the height of the silt fencing.

3.05 REMOVAL OF SILT FENCING

Silt fencing shall remain in place unless the Engineer or local government authority directs its removal. Silt fencing that has been removed shall be the property of the contractor and may be reused at another location if in good condition. Damaged or otherwise unwanted silt fencing shall be removed from the site and disposed of properly.

After silt fence removal the contractor shall dress out the area and grass according to the specifications Section 02486.

****END OF SECTION****

SECTION 02400

CONSTRUCTION DEWATERING

PART 1 - GENERAL

- 1.01 The Contractor shall be responsible for controlling groundwater in a manner that will preserve the strength of the foundation soils, will not cause instability of the excavation slopes, and will not result in damage to existing structures.
- 1.02 Where permeable soils are encountered at subgrade elevations the Contractor shall maintain the groundwater level a minimum of 3' below the prevailing excavation level.
- 1.03 The Contractor shall submit for the Engineer's approval a construction dewatering plan. The plan shall indicate the method of dewatering to be used, the location of any wells or pumps, and where pumped groundwater is to be discharged. No excavation will be allowed without an approved dewatering plan.

PART 2 - PRODUCT

- 2.01 Equipment used for dewatering is optional to the Contractor.
- 2.02 Mechanical equipment used shall be in good working order and suitable for use under the anticipated conditions.
- 2.03 Wells and well points if used shall be installed with suitable screens and filters so that continuous pumping of fines does not occur.

PART 3 - EXECUTION

- 3.01 The Contractor shall maintain and operate his dewatering equipment until the permanent structure is in place.
- 3.02 Should the Contractor choose to use any part of the permanent underdrain system for construction dewatering, he shall take appropriate precautions to prevent contamination of the underdrain material by soil fines or any other type of material which would decrease the effectiveness of the drainage material.
- 3.03 No compensation for removal of unstable material below the subgrade shall be allowed if in the opinion of the Engineer, modified dewatering techniques would solve the problem and result in a suitable subgrade.
- 3.04 Dewatering discharge shall be accessible for collection of samples by the Engineer.

****END OF SECTION****

SECTION 02433

STORM DRAINAGE PIPE

PART 1 - GENERAL

1.01 WORK INCLUDED: The work consists of furnishing and installing storm drain pipe to provide cross drainage of storm water underneath roadways.

PART 2 - PRODUCTS

2.01 CORRUGATED ALUMINUM PIPE: Section 840.01 GA D.O.T. Standard Specifications, (latest edition).

2.02 CORRUGATED STEEL PIPE: Section 844.01 GA D.O.T. Standard Specifications, (latest edition) and Standard 1030D.

2.03 REINFORCED CONCRETE PIPE: Section 843.01 GA D.O.T. Standard Specifications, (latest edition).

2.04 FLARED END SECTION: To be of same material as pipe.

PART 3 - EXECUTION

3.01 EXCAVATING, TRENCHING, AND BEDDING FOR PIPE

- A. General: Provide excavating, trenching, and bedding for storm drains in accordance with the provisions of Section 02200, and as follows:
- B. Movement of construction machinery: Use all means necessary to avoid displacement of, and injury to, the pipe and structures while compacting by rolling or operating equipment parallel with the pipe. Movement of equipment over a culvert or storm drain at any stage of construction is solely at the risk of the Contractor.
- C. Bedding: Provide a bedding surface for the pipe with a firm foundation of uniform density throughout the entire length of the pipe. Bed pipes carefully in a soil foundation accurately shaped and rounded to conform to the lower 1/4 of the outside perimeter of the circular pipe, or set the pipe in a bed of sand. Tamp bedding when necessary. Provide bell holes and depressions for pipe joints of only the length, depth, and width required for properly making the particular joint.

3.02 PLACING PIPE

- A. General:
 - 1. Carefully examine each pipe to placing. Promptly set aside all defective pipe and all damages pipe. Clearly identify all defects. Do not install defective pipe or damaged pipe.

2. Place all pipe to the grades and alignment shown.
3. Do not place pipe in water, nor place pipe when trench or weather is unsuitable for such work.
4. Install flared end section as shown on the drawings.

3.03 PIPE JOINTS

- A. Pipe joints shall be made close and even, butting all around.
- B. Coupling for corrugated metal pipe shall be either dimpled band or hugger type. Bolts and nuts shall be galvanized steel.

3.04 BACKFILLING

- A. Backfill in accordance with the provisions of Section 02200 and as specified herein.
- B. Fill material shall be deposited evenly on both sides of the pipe in tamped layers not exceeding 6" in depth until at least three-fourths the depth of the pipe has been reached. For wide trenches tamping shall be done for a distance on each side of the pipe to at least the diameter of the pipe.

****END OF SECTION****

SECTION 02444

CHAIN LINK FENCE AND GATES

PART 1 - GENERAL

1.01 WORK INCLUDED: Provide and install non-climbable chain link fence and gates of the types and sizes and at the locations shown on the drawings.

PART 2 - PRODUCTS

2.01 GENERAL

All components galvanically compatible.

2.02 CHAIN LINK FABRIC

The fabric shall be green vinyl coated, conforming to FS RR-F-00191/1 Type A, Class I, two inch mesh, one piece fabric, full height. Wire diameter shall be 0.148 inch.

2.03 GATES

The gates shall be black vinyl coated, conforming to FS RR-F-00191/2 Type A single swing or double swing as shown. Frames shall be round zinc-coated steel assembled with corner fittings and 3/8 inch steel truss rods. Fabric shall be same as for fence. Hinges shall allow for swinging the gate open through a 180 degree arc. Latches for double gates shall be of the plunge bar type operable from either side of the gate with integral padlock clasp. Keepers shall be provided for double gates.

2.04 POSTS

The posts shall be green vinyl coated, conforming to FS RR-F-00191/3, Type 1, Class 1, diameters as follows:

Line post 2 inches diameter

Corner post 3 inches diameter

Gate post 4 inches diameter.

2.05 TOP RAILS AND BRACES

Top rails and braces shall be green vinyl coated, conforming to FS RR-F-00191/3 Type II Class 1, with top rail and braces 1-5/8 inches in diameter.

2.06 BARRED WIRE SUPPORT ARMS

Conform to FS RR-F-00191/4 Type X.

2.07 BARBED WIRE

Shall be four point pattern, two strand No. 12-1/2 gauge Aluminumized steel after weaving with large barbs placed 3 inches apart. When vinyl coating is specified for fence fabric, barbed wire shall also be vinyl coated with the exception of the barbs.

2.08 CONCRETE

Class B, as described in section 03300.

2.09 BOTTOM TENSION WIRE

The bottom tension wire shall be not less than no. 7 gage wire. Tie or clips shall be provided for attaching the wire to the fabric at intervals not exceeding 2 feet.

PART 3 - EXECUTION

3.01 INSPECTION:

1. Stake out location of fence and gate prior to installation. Obtain approval of fencing and gate location from Owner prior to any installation.
2. Verify that final grading in fence location is completed without irregularities which would interfere with fence installation. Assure that maximum gap between fence fabric and ground will be no greater than 3 inches.

3.02 PREPARATION

1. Measure and lay out complete fence line.
2. Measure parallel to surface of ground.
3. Locate and Mark position of posts.
4. Locate line posts at equal distance spacing, not exceeding 10 foot centers.
5. Locate corner posts at positions where fence changes direction more than 10 degrees.

3.03 INSTALLATION

1. Posts
 - A. Minimum post hole diameter three times outside post diameter.
 - B. Minimum post hole depth 3 in. below post bottom.

- C. Place concrete in hole to depth of post bottom.
- D. Set post plumb to 1/4 in. in 10 ft.
- E. Fill hole with concrete to 2 in. above grade.
- F. Crown surface of concrete to slope away from post.

2. Fence Fabrics

- A. Stretch fabric tight between terminal post.
- B. Position bottom of fabric approximately 1 in. to 2 in. above ground level at each post.
- C. Join ends of fabric by weaving with single strand of fabric wire to form continuous mesh pattern with selvage twisted to match balance of fabric.
- D. Attach fabric to line posts using wire ties or clips, spacing not to exceed 15 in. o.c.
- E. Attach top edge of fabric to top rail using wire ties or clips, spacing not to exceed 24 in. o.c.
- F. Attach bottom edge of fabric to bottom tension wire using wire ties or clips not to exceed 24 in. o.c.

3. Gates

- A. Install gates plumb and level 1/4 in. in 10 ft.
- B. Install ground-set items in concrete.
- C. Adjust hardware to provide smooth operation.

3.04 ADJUST AND CLEAN

- 1. Adjust brace rails and tension rods for rigid installation.
- 2. Tighten hardware, fasteners, and accessories.
- 3. Remove excess and waste materials from project site.

****END OF SECTION****

SECTION 02486

GRASSING AND MULCHING

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. This work shall consist of ground preparation, furnishing and planting, seeding, fertilizing, sodding and mulching of all disturbed areas. Note that all grassing and mulching shall meet the requirements of the latest edition of the Manual for Erosion and Sediment Control in Georgia, with regard to Products and Execution.
- B. Areas to be grassed:
 - 1. All graded or disturbed areas within the construction limits where natural vegetation has been removed except for areas to be paved.
 - 2. All existing grassed areas within the final fenced area of the site shall be regressed to meet the requirements of this specification.

1.02 RELATED WORK

- A. Earthwork Section 02200

1.03 JOB CONDITIONS: Schedule work to comply with requirements for erosion control.

****END OF SECTION****

SECTION 02513

ASPHALT CONCRETE PAVING

PART 1 - GENERAL

1.01 WORK INCLUDED: All labor equipment and materials required to furnish and install Type F asphalt concrete paving as shown on the Drawings.

1.02 RELATED WORK:

A. Earthwork: Section 02200

B. Testing Laboratory Services: Section 01410

1.03 SHOP DRAWINGS

Shop drawings shall be submitted in accordance with Section 01340 of the specifications.

PART 2 - PRODUCTS

2.01 GRADED AGGREGATE BASE COURSE: Section 815, Ga. DOT Standard Specifications, latest edition.

2.02 BITUMINOUS PRIME COAT: Section 821, Ga. DOT Standard Specifications, latest edition. Viscosity grade MC-70.

2.03 ASPHALTIC CONCRETE BINDER COURSE: Section 828, Ga. DOT Specifications, latest edition. Type "B" Modified

2.04 BITUMINOUS TACK COAT: Section 822, Ga. DOT Standard Specifications, latest edition. Grade SS-1 or SS-1h.

2.05 ASPHALTIC CONCRETE SURFACE COURSE: Section 828, Ga. DOT Standard Specifications, latest edition.

PART 3 - EXECUTION

3.01 Construct graded aggregate base course in accordance with Section 310, Ga. DOT Standard Specifications, latest edition.

3.02 Apply bituminous prime coat in accordance with Section 412, Ga., DOT Standard Specifications, latest edition.

3.03 Construct asphaltic concrete binder course in accordance with Section 400, Ga. DOT

Standard Specifications, latest edition.

3.04 Apply bituminous tack coat in accordance with Section 413, Ga. DOT Standard Specifications, latest edition.

3.05 Construct asphaltic concrete surface course in accordance with Section 400, Ga. DOT Standard Specifications, latest edition.

3.06 Omit all references to measurement and payment in the Ga. DOT Specifications.

3.07 Existing Paving

Where existing paving is removed for pipeline installation, the pavement shall be restored as shown in the details included in the plans.

****END OF SECTION****

SECTION 02515

PROTECTION OF EXISTING SITE

PART 1 - GENERAL

1.00 ROADS

The contractor shall be aware of the existing paved entrance roadway. All equipment shall be unloaded off the paved sections. No track equipment shall be allowed on paved roads, without the use of pads. Any portion of the existing paving damaged due to equipment will be repaired and maintained by the contractor at no additional cost to the owner. Final repairs and repaving will require restoration of the base, and the asphalt shall be replaced per the typical trench repair shown in the plans.

1.01 GRASSING

The contractor shall re-grass any places where he has destroyed the existing grassed areas. This shall include any areas where equipment has traveled, storage sheds have been constructed, trailers have been installed, or any areas disturbed. Grading and grassing of any disturbed areas shall be described elsewhere in these specifications.

1.02 PIPING

The contractor shall repair any piping damaged during construction. All damaged piping shall be reported to the engineer before repairs are made. The owner will assist in the location of underground piping, but the contractor shall be responsible for digging down and verifying the exact locations.

1.03 PARKING

The contractor shall prepare a place for the parking of construction equipment and vehicles. The existing parking lot and paved roads will not be used by the contractor during inclement weather for the purpose of parking vehicles.

1.04 UTILITIES

The contractor shall locate and flag all power, control, phone, water, chemical, air, water and wastewater lines prior to beginning of construction. The existing drawings are for general location and layout. The contractor shall make itself familiar and locate all utilities prior to construction of any phase. The contractor will be solely responsible for repairs to any utilities damaged.

****END OF SECTION****

SECTION 02600

WASTEWATER FLOW CONTROL

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. General
- B. Depth of Flow
- C. Plugging and Blocking
- D. Pumping and Bypassing
- E. Flow Control Precautions

1.02 RELATED SECTIONS

- A. Section 01300 - Submittals
- B. Section 02730 - Sanitary Sewer Cleaning and Inspection

1.03 SUBMITTALS

- A. The Contractor shall submit a complete and detailed wastewater flow control plan to the Engineer for review, prior to commencing wastewater flow control work.

1.04 MEASUREMENT AND PAYMENT

- A. Refer to Section 01150

PART 2 - PRODUCTS

2.01 PIPE FOR FLOW DIVERSION

- A. Ductile Iron Pipe: N/A
- B. Polyethylene Pipe: Polyethylene material shall comply with the requirement for Type III polyethylene, C-5 and P-34 as tabulated in ASTM D-1248 and have the Plastic Pipe Institute recommended designation pe3406. The material shall also have an average specific base resin density of between 0.94 g/cc and 0.955 g/cc (ASTM D-1505). Pipe made from these resins must have a long-term strength (50 years) rating of 1,250 psi or more per hydrostatic design basis categories of ASTM d-2837. The polyethylene resin shall have an environmental stress crack resistance, condition C as shown in ASTM D-1693, to be greater than 500 hours 20% failure. All pipe shall be made from the manufacturer's own production of the same formulation shall be used. The polyethylene resin

shall have an average melt flow index, condition E as shown in ASTM D-1238, not in excess of 0.25 g/10 min. Pipe shall be homogeneous throughout, and free of visible cracks, holes, foreign material, blisters, or other deleterious faults. Diameters and wall thickness shall be measured in accordance with ASTM D-2122. Pipe joining will be done by thermal butt fusion method in accordance with ASTM D-2657.

- C. Acrylonitrile-Butadiene-Styrene (ABS): ABS pipe shall comply with requirements of ASTM D-2751.

PART 3 - EXECUTION

3.01 GENERAL

- A. All materials used for wastewater flow control shall be pre-approved by the Engineer prior to commencing wastewater flow control activities.
- B. When wastewater flow at the upstream manhole of the sewer section being repaired are above the maximum allowable requirements for television inspection, or do not allow the proper sewer or manhole repair, the flows shall be reduced to the levels required by one of the following methods: plugging/blocking of the flows, or pumping/bypassing of the flows as approved by the Engineer.
- C. In some applications, the wastewater flow may be plugged and contained within the capacity of the collection system. This shall only be done when the Engineer has been determined, that the system can accommodate the surcharging without any adverse impact.
- D. For the initial television inspection, before a liner is installed, the Contractor shall plug the sewer line completely. No flow, except infiltration/inflow, will be allowed through the respective sewer line being televised on the pre-repair television survey.
- E. When sewer flow at the upstream manhole of the line being repaired, in the opinion of the Engineer, is too excessive to plug while the rehabilitation is being performed; the Contractor shall submit a written plan and pump/bypass the flow as acceptable to the Engineer.
- F. When existing storm or sanitary sewers are required to be taken up, moved, or rebuilt, the Contractor, at his own expense, shall provide and maintain temporary outlets and connections for all private or public drains, sewer, and sewer outlets connected to or served by the sewers to be rebuilt, and where necessary, shall provide adequate pumping facilities; and shall maintain these services until such time as the permanent sewers and connections are built and in service at no cost to the owner.
- G. During construction, flows in sections of the existing sewer being rehabilitated by removal and replacement shall be accommodated by temporary flow diversion. Wastewater flow diversion shall be

accomplished as specified in this section, unless otherwise shown on the Plans.

- H. The Contractor shall use the provided construction easement for the flow diversion if not otherwise shown on the Plans. The Contractor shall use ingenuity and skill to develop a flow diversion program. The program must keep the wastewater flowing without discharge or spills into the creek or on the ground. The Contractor will seek and obtain inspection of each section of newly laid sewer before taking the diversion out of service and placing the new section in service.
- I. In sections of the existing sewer being rehabilitated by laying a new line parallel to the existing sewer, the existing sewer may be used to accommodate the existing flow and no temporary flow diversion will be necessary if the existing sewer is not damaged or its use restricted by the Contractor's operations.
- J. All pipe material utilized in wastewater flow diversion during construction shall be in good condition, and free of defects, and leaks. The Contractor at no cost to the owner shall replace any defective material. Upon completion of the job, pipe materials shall be removed from the site.

3.02 DEPTH OF FLOW

- A. In performing television inspection, joint testing, and/or sealing and other sewer rehabilitation work, the Contractor shall control the depth of flow in the sewer within the following guideline:

MAXIMUM FLOW DEPTH			
TELEVISION INSPECTION		JOINT TESTING AND SEALING	
PIPE SIZE	% PIPE DIA.	PIPE SIZE	% PIPE DIA.
6" – 10"	20	6" - 12"	25
12" - 24"	25	15" – 24"	30
27" or larger	30	27" or larger	35

- B. When sewer line flow, as measured in the first manhole upstream of the sewer segment being rehabilitated, exceeds the maximum depth listed

above or inspection of the complete pipe periphery is necessary for effective testing, sealing, or line work, the Contractor shall implement wastewater flow control methods.

3.03 PLUGGING AND BLOCKING

- A. The Contractor shall insert a sewer line plug into the line at a manhole upstream from the section being inspected or repaired. The plug shall be so designed that all or any portion of the flow can be released. During the survey portion of the operation, flows shall be shut off or reduced to within the maximum flow limits specified. During repairs, the flow shall be shut off or pumped/bypassed, as approved by the Engineer. Wastewater flow shall be restored to normal following completion of work within the subject sewer section.
 - 1. No wastewater shall be allowed to back up into any home or buildings.
 - 2. No wastewater shall overflow any manholes, cleanouts, or any other access to the sewers.
 - 3. Users upstream of the repair area shall be able to use all their water and sewer utilities without interruption.
 - 4. If any of the above occur or are expected to occur, the Contractor shall provide bypass pumping to alleviate one or all of the conditions. Additionally, the Contractor shall observe the conditions upstream of the plug and be prepared to immediately start bypass, if needed.
- B. Any sump pumps, bypass pumps, trash pumps, or any other type of pump which pulls wastewater or any type of material out of the manhole or sewer shall discharge the material into another manhole, or appropriate vehicle or container approved by the Engineer. Under no circumstance shall this material be discharged, stored, or deposited on the ground, swale, road, or open environment.
- C. The Contractor shall take appropriate steps to ensure that all pumps, piping, and hoses that carry raw wastewater are protected from traffic. Traffic control shall be performed in accordance with Section 1570 - Traffic Regulation.
- D. In the event, during "Wastewater Flow Control," that raw wastewater is spilled, discharged, leaked, or otherwise deposited in the open environment, due to the Contractor's work, the Contractor shall be responsible for any cleanup of solids and stabilization of the area affected. This work shall be performed at the Contractor's expense with no additional cost to the Owner. The Contractor shall also be responsible for notifying the sewer system maintenance personnel and complying with

any and all regulatory requirements for cleaning up the spill at no additional cost to the Owner.

- E. During wastewater flow control operations, the Contractor shall take proper precautions to prevent damage to existing sanitary sewer facilities, flooding, or damage to public or private property.
- F. The Contractor shall make repairs or replacements or rebuild such sections of existing sewer damaged due to contractor negligence, as directed by the Engineer. All such repairs, replacements, and rebuilding of sewer lines damaged by the Contractor shall be paid for by the Contractor.
- G. The Contractor shall make such provisions as are necessary for handling all flows in existing sewers, connections, and manhole by pipes, flumes, or by other approved methods at all times, when his operations would, in anyway, interfere with normal functioning of those facilities.
- H. The Contractor shall be responsible for the removal of any debris sedimentation in the existing sewers, laterals, and manholes, etc., which is attributed to his work under this Contract.
- I. The Contractor shall perform all operations in strict accordance with OSHA regulations and any applicable local safety requirements. Particular attention is directed to safety regulations for excavations and entering confined spaces.
- J. It is the Contractor's responsibility to notify in writing any property owner having a sewer service connection on the sewer being rehabilitated or replaced that such work is being performed. The Contractor shall notify property owners 48 hours prior to commencing sewer rehabilitation or replacement. The Contractor shall be solely responsible for any damage caused by property service connection and backups caused by the sewer rehabilitation operations.

****END OF SECTION****

SECTION 02605

PRECAST CONCRETE MANHOLES AND STRUCTURES

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Provide and install pre-cast concrete manholes and vaults of the size and types at the locations shown on the drawings.

1.02 RELATED WORK

- A. Earthwork is included in Section 02200
- B. Cast-in-Place Concrete is included in Section 03300

1.03 SUBMITTALS

- A. Submit to the Engineer, in accordance with Section 01300, copies of all materials required to establish compliance with this Section. Submittals shall include at least the following:
 - 1. Product data, materials data, and installation data for base sections, riser sections, eccentric and concentric conical top sections, and flat slab tops, with notarized certificate indicating compliance with ASTM C478.
 - 2. Details of pipe connections to manholes and vaults.
 - 3. Product data for manhole rungs, including method of installation.
 - 4. Product data for manhole frame and cover with notarized certificate indicating compliance with ASTM C48, Class 30.
 - 5. Product data for sewer brick with notarized certificate indicating compliance with ASTM C32, Grade 55
 - 6. Design data for precast concrete structures:
 - a. Sectional plans and elevations showing dimensions and reinforcing steel placement.
 - b. Structural calculations including assumptions.

1.04 REFERENCE STANDARDS

- A. Design, manufacturing, and assembly of elements of the equipment herein specified shall be in accordance with, but not limited to, published standards of the following, as applicable:

1. American Society for Testing and Materials (ASTM)
 - a. ASTM A48 – Standard Specification for Gray Iron Castings.
 - b. ASTM A615 – Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
 - c. ASTM C32 – Standard Specification for Sewer and Manhole Brick Made from Clay or Shale.
 - d. ASTM C33 – Standard Specification for Concrete Aggregates.
 - e. ASTM C62 – Standard Specifications for Building Brick (Solid Masonry Units Made from Clay or Shale).
 - f. ASTM C150 – Standard Specification for Portland Cement.
 - g. ASTM C207 – Standard Specification for Hydrated Lime for Masonry Purposes.
 - h. ASTM C443 – Standard Specifications for Joints for Circular Concrete Sewer and Culvert pipe, using Rubber Gaskets.
 - i. ASTM C478 – Standard Specification for Precast Reinforced Concrete Manhole Sections.
 - j. ASTM D4101 – Standard Specification for Propylene Plastic Injection and Extrusion Materials.
2. American Concrete Institute (ACI)
 - a. ACI 318 – Building Code Requirements for Reinforced Concrete
 - b. ACI 350R – Environmental Engineering Concrete Structures
3. American Association of State Highway and Transportation Officials (AASHTO)
 - a. Standard Specifications for Highway Bridges
4. Occupational Safety and Health Administration (OSHA)

B. Where reference is made to standards of one of the above or other organizations, the version of the standard in effect at the time of bid opening shall apply.

1.05 QUALITY ASSURANCE

- A. All materials shall be new and unused. The design, materials, manufacturing process, and transportation or sections shall be subject to inspection and approval at any time by the Engineer. Inspection may be made at place of manufacture, at work site

following delivery, or both.

- B. Materials will be examined for compliance with ASTM standards, this Section, and approved manufacturer's drawings. Additional inspection criteria shall include: appearance, dimensions(s), blisters, cracks, and soundness.
- C. Materials shall be rejected for failure to meet any requirements specified herein. Rejection may occur at place of manufacture, at work site, or following installation. Material on the job site that is found to be defective shall be moved immediately after being notified as unacceptable. Rejected materials shall be replaced at no cost to the Owner.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Reference to a manufacturer's name and model or catalog number is for the purpose of establishing the standard of quality and general configuration desired.
- B. Like items of materials/equipment shall be the end products of one manufacturer in order to provide standardization for appearance, operation, maintenance, spare parts and manufacturer's service.
- C. Provide lifting lugs or holes in each precast section for proper handling.

2.02 PRECAST CONCRETE MANHOLES

- A. Precast manholes, including base sections, risers, top sections, and flat slab top sections shall conform to ASTM C478 and meet the following requirements:
 - 1. Bottom slab thickness shall equal the riser wall thickness or flat slab top thickness, whichever is greater.
 - 2. Top section shall be eccentric cone where cover over pipe exceeds 4 ft. Top section shall be a flat slab where cover over top of pipe is 4 ft or less.
 - 3. Base, riser, and transition top sections shall have tongue and groove joints with preformed mastic sealer.
 - 4. Precast concrete sections shall be constructed of Portland Cement with a 28-day compressive strength of not less than 4,000 pounds per square inch.
 - 5. Design precast concrete base, riser, transition top, flat slab top, and grade ring for a minimum 300 psf loading plus earth load. Calculate earth load with a unit weight of 130 pcf.
 - 6. Mark date of manufacture, name and trademark of manufacturer on the inside of each precast section.

7. Construct and install precast concrete base as shown on the Drawings.
8. Provide integrally cast knockout panels in precast concrete manhole sections at locations and with sizes shown on Drawings. Knockout panels shall have no steel reinforcing.

2.03 PRECAST CONCRETE STRUCTURES

- A. Precast reinforced concrete structures shall be manufactured by Tindall, Stay-Rite, or an approved equal. Refer to Drawings for inside dimensions, headroom requirements, and minimum thickness of concrete.
- B. Manufacturer shall notify Engineer at least 5 working days prior to placing concrete during manufacturing process. Engineer may inspect reinforcing steel placement prior to placing concrete.
- C. Structural design calculations and shop drawings shall be prepared and stamped by a professional engineer registered in Georgia.
- D. Design criteria:
 1. Precast concrete
 - a. The 28-day minimum compressive strength shall be 5,000 psi.
 - b. The maximum water content shall be six gallons per 94 pound sack of cement.
 - c. Minimum cement content shall be six 94 pound sacks of cement per cubic yard of concrete.
 2. Manufactured products
 - a. Conform to ACI 318 and ACI 350R.
 - b. Analyze walls and slabs using accepted engineering principals.
 - c. When “fy” exceeds 40,000 psi, “z” (ACI 318) shall not exceed 95,000 psi. “fs” shall not exceed 50 percent of “fy”.
 - d. Design products to support their own weight, weight of the soil at 120 pcf, and a live load equal to 300 psf applied to top of slab.
 - e. Cast base slab and walls together to form a monolithic base section.
 - f. Design structure walls for a water pressure of 90 psf. Originate pressure diagram at finished ground surface.
 - g. Consider discontinuities in structure produced by openings and joints.

Provide additional reinforcing around openings. Frame openings to carry full design loads to support walls.

- h. Prevent flotation, with ground water level at finished ground surface, by dead weight of structure and soil load above structure. Do not consider skin friction, soil friction, or weight of equipment in structure.
- i. Locate horizontal wall joints 18-in minimum from horizontal centerline of wall openings. Design structure with a minimum number of joints.
- j. Provide lifting hooks for top slab.
- k. Locate access openings, wall sleeves, and pipe penetrations as shown on Drawings. Wall sleeves shall be provided by precast concrete manufacturer.

2.04 BRICK MASONARY

- A. Bricks shall be sound, hard, uniformly burned, regular and uniform in shape and size. Underburned or salmon brick shall not be acceptable. Only whole bricks shall be used.
 - 1. Bricks for channels and shelves shall conform to ASTM C32, Grade SS except that the mean of five tests for absorption shall not exceed 8 percent and no individual brick shall exceed 11 percent.
 - 2. Bricks for raising manhole frames to finished grade shall conform to ASTM C62.
- B. Mortar shall be composed of 1 part Portland cement, 2 parts sand, and hydrated lime not to exceed 10-lbs to each bag of cement. Portland cement shall be ASTM C150, Type II; hydrated lime shall conform to ASTM C207.
- C. Sand shall be washed, cleaned, screened, well graded with all particles passing a No. 4 sieve and conform to ASTM C33.

2.05 FRAMES AND COVERS

- A. Manhole frames shall be cast iron with a coat of asphaltic paint applied at the foundry. The weight of the frame shall be approximately 160 lbs and the cover approximately 70 pounds. The frame and cover shall be USF 580 Ring with Type K Cover or approved equal. Covers shall have "Valve" cast in them.

2.06 VAULT HATCHES

- A. Vault hatches shall be as shown on the detailed plan drawings.

2.07 JOINTING PRECAST MANHOLE SECTIONS AND STRUCTURES

- A. Seal tongue and groove joints of precast manhole and structure sections with either rubber O-ring gasket or preformed flexible joint sealant. O-ring gasket shall conform

to ASTM C443. Preformed flexible joint sealant shall be Kent Seal No. 2 as manufactured by Hamilton-Kent; Ram-Nek as manufactured by K.T. Snyder Company or approved equal.

- B. Completed joint shall withstand 15 psi internal water pressure without leakage or displacement of gasket or sealant.

2.08 RUNGS

- A. Rungs shall be steel reinforced, copolymer polypropylene, 14-in wide, M.A. Industries Inc., PF Series or approved equal. Copolymer polypropylene shall conform to ASTM D4101 Classification PP200 B33450 Z02. Steel reinforcing shall be ½-in diameter, conforming to ASTM A615, Grade 60 and shall be continuous throughout rung.

2.09 PIPE CONNECTIONS TO MANHOLES AND STRUCTURES

- A. Connect pipe to manholes and structures in the following ways:
 - 1. Flexible sleeve – Integrally cast sleeve in precast section or install sleeve in a formed or cored opening. Fasten pipe in sleeve with stainless steel clamps. Coat stainless steel clamps with bituminous material to protect from corrosion. Flexible sleeve shall be Lock Joint Flexible Manhole Sleeve; Kor-N-Seal connector type as manufactured by National Pollution Control Systems, Inc ; PSX Press-Seal Gasket or approved equal.
 - 2. Compression gasket – Integrally cast compression gasket in precast section. Insert pipe into compression gasket. Compression gasket shall be A-Lok, or approved equal.

2.10 MANHOLE AND VAULT STEPS

- A. Manhole and vault steps shall consist of #3 steel reinforcing bars covered with polypropylene plastic or rubber and shall be supplied with depth rings and other necessary appurtenances. The manhole steps shall be “HILT” as manufactured by M.A. Industries, Inc or approved equal.

2.11 DAMPPROOFING

- A. Dampproofing shall be Hydrocide 648 by Sonneborn Building Products; Dehydratine 4 by A.C. Horn Inc.; RIW Marine Liquid by Tock Brothers, or approved equal.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Manhole and Structure Installation.
 - 1. Manholes and structures shall be constructed to the dimensions shown on the

Drawings and as specified herein. Protect all work against flooding and flotation. Construct cast-in-place bases in accordance with the requirements of Division 3 and the details shown on the Drawings.

2. Place base on a bed of 12-in screened gravel as shown on the Drawings. Set base grade so that a maximum grade adjustment of 8-in is required to bring the frame and cover to final grade.
 - a. Use precast concrete grade rings or brick and non-shrink mortar to adjust frame and cover to final grade.
3. Set precast concrete barrel sections and structures plumb with a ¼-in maximum out of plumb tolerance allowed. Seal joints of precast barrel sections with either a rubber “O” ring set in a recess or preformed flexible joint sealant in sufficient quantity to fill 75 percent of the joint cavity. Fill the outside and inside joint with non-shrink mortar and finished flush with the adjoining surfaces. Leaking barrel section joints shall be caulked on the inside with lead wool or non-shrink grout.
4. Allow joints to set for at least 14 hours before backfilling.
5. Plug holes in the concrete barrel sections required for handling with a non-shrinking grout or non-shrinking in combination with concrete plugs. Finish flush on the inside.
6. Cut holes in precast sections to accommodate pipes prior to setting sections in place to prevent jarring which may loosen the mortar joints.
7. Backfill carefully and evenly around sections.

B. Pipe Connections

1. Construct pipe connections, including pipe stubs, as specified above. Close or seal pipe stubs for future connections with a gasketed watertight plug.

C. Rung Installation

1. Steel Reinforced Polypropylene Plastic Rungs
 - a. Preform holes for rungs during casting of the sections, using tapered form pins specifically made for performing manhole rung holes.
 - b. Drive rungs into preformed holes after concrete has developed a compressive strength of 3,000 psi.
 - c. Alternatively, cast rungs into precast sections when concrete is placed.
 - d. Drilling holes for rungs may be used to accommodate field conditions when approved by the Engineer. Drill holes of diameter, spacing, and depth

required by rung manufacturer.

D. Brickwork

1. Mix mortar only in such quantity as may be required for immediate use. Use mortar before initial set has taken place. Mortar shall be used within 1-1/2 hours and shall be constantly worked with hoe or shovel until used. Anti-freeze mixtures shall not be included in the mortar. Install masonry when the outside temperature is above 40°F unless provisions are made to protect the mortar, bricks, and finished work from frost by heating and enclosing the work with tarpaulins or other suitable material.
2. Construct channels and shelves of brick and concrete as shown on the Drawings. Brick lined channels shall correspond in shape with the lower half of the pipe. Set shelf elevation at crown of highest pipe and slope 1-in/ft to drain toward the flow through the channel. Construct brick surfaces exposed to sewage flow with nominal 2-in by 8-in face exposed or bricks on edge.

E. Setting Frames and Covers

1. Set frames and covers in a full mortar bed. Utilize bricks or precast concrete grade rings, a maximum of 9-in thick, to assure frame and cover are set to the finished grade.
2. Set frame and cover to final grade prior to placement of permanent paving, when applicable.

F. Dampproofing

1. Paint outer surfaces of precast and cast-in-place manholes and structures with two coats of bituminous dampproofing at the rate of 30 to 60 ft²/gallon, in accordance with manufacturer's instructions.

3.02 LEAKAGE TESTS

- A. Test each manhole and structure for leakage. The Engineer shall observe each test. Perform exfiltration test as described below:
- B. Assemble manhole in place; fill and point all lifting holes and exterior joints within 6-ft of the ground surface with an approved non-shrinking mortar. Test prior to placing the shelf and invert and before filling and pointing the horizontal joints below 6-ft of depth. Lower ground water table below bottom of the manhole for the duration of the test. Plug all pipes and other openings into the manhole and brace to prevent blow out.
- C. Fill manhole with water to the top of the cone section.
 1. If the excavation has not been backfilled and no water is observed on the exterior

surface of the manhole, the manhole is satisfactorily watertight.

2. If water is observed on the exterior surface or if the manhole excavation has been backfilled, continue the test as follows:
 3. A period of time may be permitted to allow for absorption. Following this period, refill manhole to the top of the cone, if necessary and allow at least 8 hours to pass. At the end of the test period, refill the manhole to the top of the cone again, measuring the volume of water added. Extrapolate the refill amount to a 24-hour leakage rate.
 4. The leakage for each manhole shall not exceed one gallon per vertical foot for a 24-hour period. If the manhole fails this requirement, but the leakage does not exceed three gallons per vertical foot per day, make repairs using approved methods and materials.
 5. If leakage due to a defective section of joint exceeds three gallons per vertical foot per day, the manhole shall be rejected. Uncover the rejected manhole as necessary and disassemble, reconstruct and reseal, or replace it as directed by the Engineer. Retest the manhole and, if satisfactory, fill and paint the interior joints.
- D. No adjustment in the leakage allowance will be made for unknown causes such as leaking plugs, absorptions, etc. It will be assumed that all losses of water during the test is a result of leaks through the joints or through the concrete.
- E. An infiltration test may be substituted for an exfiltration test if the ground water table is above the highest joint in the manhole. If there is no leakage into the manhole, the manhole will be considered watertight. If leakage is detected, conduct exfiltration tests as described herein before.
- F. Leakage Test for Structures
1. Structures shall be visually inspected for possible leaks before backfilling of structures is allowed. Leaking joints shall be sealed using approved methods and materials.
 2. Perform exfiltration tests as described above for manholes on any structure which shows detectable leakage after the joints have been sealed.

3.03 CLEANING

- A. Thoroughly clean all manholes and structures of all silt, debris, and foreign material of any kind prior to final inspection.

****END OF SECTION****

SECTION 02606

SANITARY SEWER CONSTRUCTION

PART 1 - GENERAL

1.01 WORK INCLUDED

The work covered in this section includes the furnishing of all labor, tools, equipment, materials and incidentals necessary to construct sewer lines at the location and in accordance with the details shown on the plans. All workmanship shall be first class and conform to accepted practice.

1.02 ORDER OF WORK

Work shall proceed in an orderly and workmanlike manner. The starting point or points for construction and the order in which the work shall be constructed, completed and placed into operation shall be coordinated with the Engineers or their representative. Contractor must keep siltation and bank erosion to an absolute minimum during construction.

1.03 GENERAL METHODS

- A. Information Concerning Conditions
- B. The accuracy of information furnished by the Owner, the consulting engineer, or information shown on the plans and specifications as to the underground and surface structures, foundation conditions, character of soil, position and quantity of ground and surface water, rock, etc., shall not relieve the Contractor of his responsibility. The Contractor must satisfy himself by personal examination and by such other means as he may desire with respect to actual conditions in regard to the nature of the ground, subsoil, and water conditions, and in regard to the location of existing underground or subsurface structures.
- C. All existing pipes, drains, or other structures on, above or below ground shall be carefully supported and protected from injury and if injured, they shall be restored in a satisfactory manner by and at the expense of the Contractor.

PART 2 - PRODUCT

2.01 GENERAL

The Contractor shall furnish all materials and incidental items (whether or not they are specifically described herein) necessary to complete all work called for under the contract, except for any items that are specifically listed in these contract documents as being furnished by the Owner.

2.02 SUBGRADE STABILIZER

Subgrade stabilizer shall consist of crushed stone meeting size and gradation requirements for Georgia D.O.T. #57 designation.

2.03 GRAVITY SEWER PIPE

All sanitary sewer pipe be, Polyvinyl Chloride (PVC) or Ductile Iron Pipe (DIP) as shown on the plans or specifically called out otherwise.

A. Ductile Iron Pipe (DIP)

1. Ductile iron pipe and fittings shall conform to the requirements of ANSI: A21.50-81 (centrifugally cast in metal or sand lined molds). Pipe thickness class shall be determined by sound engineering principles based on depth, loading, soil material, and other factors, but shall not be less than standard pressure class 350.
2. Pipe interior shall be polybond, polyline, polyurethane or protecto 401 ceramic epoxy lined with a minimum thickness of 40 mils and sealed with an approved exterior bituminous seal coat in accordance with ANSI A21.51 (AWWA C151).

The exterior of the pipe shall be seal coated with an approved bituminous seal coat in accordance with ANSI:A21.4.

Ductile iron pipe shall be of the bell and spigot type with push-on joints, conforming to ANSI Specification A21.11 or mechanical joints.

B. Polyvinyl Chloride (PVC) Sewer Pipe

1. Scope: The Contractor shall provide unplasticized polyvinyl chloride (PVC) plastic gravity sewer pipe meeting the requirements of ASTM D3034 and ASTM F679 (Latest Revision) in the sizes shown unless otherwise indicated on the contract documents.
2. Materials: Pipe and fittings shall meet the requirements as specified under ASTM D3034 (Latest Revision) for pipe, through 15" and ASTM F679 for pipe 18" through 24". All pipe and fitting shall be suitable for use as a gravity sewer conduit. Bell joints shall consist of an integral wall section with elastomeric gasket joint which provides a water tight seal. The pipe shall be capable of passing all tests which are detailed in this specification. Minimum wall thickness shall be as follows:

4" - 0.120 inches

6" - 0.180 inches

8" - 0.240 inches

10" - 0.300 inches

12" - 0.360 inches

15" - 0.437 inches

18" - 0.536 inches

24" - 0.711 inches

3. Fittings: All fittings and accessories shall be manufactured and furnished by the pipe supplier. They shall have bell and/or spigot configurations compatible with that of the pipe and shall have an equivalent wall thickness.
4. Pipe and Fittings Tests: The Contractor will be required to furnish a written outline of the manufacturer's quality control program for the Engineer's approval prior to shipping any pipe to the project. Before installing any pipe the Contractor shall furnish written certification that all pipe through 15" meets ASTM Specification D3034 and for 18" through 24" must meet ASTM F679. At least one sample from each 100 pieces of pipe furnished shall be subjected to each test outlined under section eight (8) of ASTM D3034. The samples will be tested by an independent laboratory approved by the Engineer, and a certified copy of results will be furnished to the Engineer. If any test is not met then nine (9) additional tests of that pipe will be ordered; and, if any of these nine (9) tests are not met, the manufacturer will not be allowed to furnish materials for this project. The cost of all testing shall be included in the Contractor's bid proposal and no pipe shall be installed until the testing is complete and approved by the Engineer.
5. Pipe Stiffness: Minimum "pipe stiffness" (F/Y) at five (5) percent deflection shall be 46 psi for all sizes, when tested in accordance with ASTM Standard Method of Test D2412 (Latest Edition), to determine the 'External Loading Properties of Plastic Pipe by Parallel Plat Loading'. There shall be no evidence of splitting, cracking, or breaking at a deflection of up to 30 percent of the original diameter.
6. Fusion Quality: There shall be no evidence of flaking, swelling, or disintegration when the pipe material is tested in accordance with ASTM D2152, "Quality of extruded Poly (Vinyl Chloride) pipe by Acetone Immersion".
7. Joint Tightness: Pipe and fitting joints shall comply with ASTM D3212 (Latest Edition) for "Joints for Drain and Sewer Plastic

Pipes Using Flexible Elastomeric Seals". Joint assemblies shall not leak when subjected to both an internal and external hydrostatic test at equivalent pressures of 10.8 psi gauge for a period of one hour. Pipes shall be tested in straight alignment, axially deflected position, and by shear load test as otherwise defined in paragraphs 7.2, 7.3, and 7.4 of ASTM D3212.

8. Installation: PVC pipe will be installed in accordance with ASTM D2321 (Latest Revision). In any area where the pipe is below existing ground water level, the contractor will embed PVC pipe in sand or graded gravel. No special compaction requirements will be necessary; however, the sand or gravel must extend from six inches below the pipe to the top of the pipe, and the material must be firmly placed under the pipe haunches. When embedding PVC pipe in friable, compressible soils (Eg. silt, clay, sandy clay, silty clays, etc.), special care must be exercised to provide a uniform (undisturbed or fully compacted) trench bottom. Additionally, the backfill must be compacted to 95% standard proctor in six (6) to eight (8) lifts to twelve inches above the top of the pipe. The engineer may require up to ten (10) random compaction tests to insure compliance with D2321. If any material tested is less than the required density then the contractor shall re-compact said material at no additional expense to the owner, and the engineer shall then have the right to additional compaction tests at the expense of the contractor to insure compliance with D2321.
9. Deflection Limit: Vertical deflection of installed pipe shall not exceed five (5) percent of the undeflected diameter as defined in Table XI.1 of ASTM D3034.

Upon completion of the pipe laying, and at least 30 days after installation (to allow for settling), the pipe will be tested again for final acceptance. The test shall be performed by the Contractor pulling a mandrel of specified dimensions through the pipeline.

PART 3 - EXECUTION

3.01 CLEARING AND GRUBBING

Where necessary, the Contractor shall clear and grub a travelway of sufficient width along the pipeline to permit installation of the pipe and shall dispose of all trees, shrubs and refuse as directed by the Engineer.

All burning (when permitted) shall comply with local regulations.

No trees, stumps, brush or other debris shall be pushed out into the area which is not being cleared and the trees in the uncleared area shall be protected and not damaged during the clearing and construction operation.

3.02 TRENCH EXCAVATION FOR GRAVITY SEWER

Excavation shall be by open cut from the ground surface, unless otherwise called for on the plans or allowed by the Engineer. Not more than 100 feet of trench shall be opened on any line in advance of pipe laying.

No excavation shall be made under highways, streets, alleys or private property until satisfactory arrangements have been made with the State, City, County, and owners of the property to be crossed.

Pipe trenches shall be excavated straight and true to grade and line. The trenches shall have smooth even bottoms affording the pipe support throughout its length between bell holes. Bell holes shall be dug sufficiently large for properly joining the pipe.

If so ordered by the Engineers, the bottom of the trenches shall be hand dressed. Trenches shall be of sufficient width to provide ample working space on each side of the pipe and for maintaining a straight line of pipe. However, in general the trench width should not exceed the diameter of the pipe plus two feet.

It is the responsibility of those installing sanitary sewers to conform to OSHA regulations, 29 CFR Part 1926, Subpart P, Paragraph 1226.650 through A26.653 during trench excavation. All excavations shall be adequately guarded with barricades and lights in compliance with all OSHA and Georgia Department of Transportation requirements so as to protect the public from hazard. Excavations adjacent to existing or proposed buildings and structures or in paved streets or alleys shall be sheeted, shored and braced adequately to prevent undermining or subsequent settlement of such structures or pavements. Underpinning of adjacent structures shall be done when necessary to maintain structures in safe condition, at no additional cost to the owner.

When possible, all crossings of paved highways or driveways by pipe line shall be made by boring or jacking the pipe under the pavement and shall be done in such manner as not to damage the pavement or foundation, unless the casing or pipe is in solid rock, in which case the crossing shall be made by the open cut method or by tunneling.

Wherever streets, roads, or driveways are cut, they shall be immediately backfilled and compacted after the pipe is laid and shall be maintained in first-class condition as passable at all times until repaved.

Backfilling, compaction, dressing and clean-up shall be kept as close to the line laying crew as is practical, and negligence in this feature of the work will not be tolerated.

3.03 TRENCH WIDTHS

Trench widths for sewer pipe shall have a maximum width, measured at the center line of the pipe, equal to the nominal diameter of the pipe, plus two feet. The trenches may have a greater width than this, beginning at one foot above the top

of the pipe and extending to the top of the ground, is such width is necessary or desirable.

3.04 SUBGRADE AND BEDDING

All pipe shall have a minimum Class "C" bedding as shown on the drawings, unless specifically designated in the plans and specs as Class "A" and "B".

A. Class "A" Bedding

Class "A" bedding refers to bedding with concrete cradle, arch or encasement. The Contractor shall conform to details shown in the contract drawings when Class "A" bedding is required.

B. Class "B" Bedding

The pipe shall be bedded in crushed granite material, conforming to ASTM D448 "Standard Specification for Coarse Aggregate," size #57 or other suitable materials and methods, as approved by the Engineer. The bedding shall be placed on a flat trench bottom with a minimum thickness beneath the pipe of one-eighth the outside pipe diameter, but not less than six (6) inches (150 mm) and sliced under the haunches of the pipe with a shovel or other suitable tool to height of one-half the outside pipe diameter, or to the horizontal centerline. The initial backfill shall be hand placed to a level of 12 inches (300 mm) over the top of the pipe and shall consist of finely divided materials free from debris, organic material and large rock and stones. It shall be tamped in layers not over 6 inches thick to at least 90% standard proctor, AASHTO T-99 (95% under road crossings). Remainder of backfill to top of trench shall be tamped in layers not over 12 inches thick (six 6 inches under roads) to 85% standard proctor, AASHTO T-99 (95% under road crossings and 90% inside treatment plant facilities).

Tamping shall be done with mechanical tamps in such a manner as to meet compaction requirements without moving or injuring pipes. Compaction shall be done with either pneumatic hand tamps, hydro-tamps or other approved methods. Compaction tests will be as directed by the Engineer to insure that the above specifications are being met.

In rock excavation, the backfill from one-half the outside pipe diameter to two feet above the top of the pipe shall be finely pulverized soil, free from rocks and stones. The rest of the backfill shall not contain over 50% broken stone, and the maximum sized stone placed in the trench shall not have a weight exceeding 25 pounds. Excess rock and fragments of rock weighing more than 25 pounds shall be loaded and hauled to disposal as directed by the Engineer. If it is necessary, in order to comply with the above specifications, selected backfill shall be borrowed and hauled to the trenches in rock excavation, at no additional cost to the Owner.

C. Class "C" Bedding

The pipe shall be bedded in granular material placed on a flat trench bottom. The bedding material shall have a minimum thickness beneath the pipe of six (6) inches (150 mm) or one-eighth of the outside diameter of the pipe, whichever is greater and sliced under the haunches of the pipe with a shovel or other suitable tool to a height of one-sixth or one-half (as may apply per the detail shown on the plans) of the outside diameter of the pipe. Bedding materials may be crushed stone, rounded gravel, shells, pea gravel, sand or other locally available non-cohesive soils meeting the following requirements:

Allowable soils shall be dry course-grained soils ranging from well-graded gravel-sand mixtures with little or no fines to clayey sands and sand-clay mixtures with appreciable amounts of fines. All soil materials shall have 100% passing a 1-1/2 inch sieve and a maximum of 55% passing a No. two (2) sieve. The maximum volume change allowable shall be 15%. Allowable soils shall be Class I and Class II as defined in Section 810, of the Georgia Department of Transportation Specifications for the Construction of Roads and Bridges.

Wherever water is encountered Class "B" bedding shall be provided. In case a trench is excavated below grade, except in rock excavation or unless ordered by the Engineer, the Contractor shall refill same to the proper grade with suitable, thoroughly compacted material without additional compensation to the contractor for the additional material.

All gravel or crushed stone used for Class "C" bedding shall have a gradation equal to or smaller than #57 stone in order to limit the void area, and all the material must pass a 1-1/2 inch sieve. Where sand or other acceptable soil is used, it shall be spread over the trench bottom, compacted to at least 85% maximum density and shaped before placing the pipe; after the pipe is placed, additional material shall be compacted under the haunches and for the full trench width as described above in Class "B".

The excavation for manholes shall extend to a firm acceptable foundation and leave not less than 24 inches in the clear between their exterior surface and the embankment of timber that may be used to protect it.

The Contractor shall furnish, install and maintain such sheathing, bracing, etc., as may be required to support the sides of the excavation and to prevent any movement that might injure the pipe, or sloughing of the street or trench, or otherwise injure or delay the work or interfere with adjoining structures.

Trenches shall be kept free of water. No structure shall be built or pipe shall be laid in water, and water shall not be allowed to flow over or rise upon any concrete, masonry or pipe until the same has been inspected and

the concrete or joint material has thoroughly set. All water pumped, bailed or otherwise removed from the trench or other excavation shall be conveyed in a proper manner to a suitable place of discharge where it will not cause injury to the public health or to public or private property or to work completed or in progress, or to the surface of the streets or cause any interference with the use of same by the public.

The length of the trench to be opened in advance of the completed work shall be limited by the Engineer with regard to both the expeditious construction and to the convenience and comfort of the persons residing in the vicinity of the work.

In excavation and backfilling and laying pipe, care must be taken not to remove or injure any water, sewer, gas or other pipes, conduits or other structures without an order from the Engineer. When an obstruction is encountered, the Contractor shall notify the Engineer who will have the Owners, of the obstruction adjust same or make necessary changes in grade and/or alignment to avoid such obstruction. Any connection, drains or other structures damaged by the Contractor shall be repaired or replaced without cost to the Owner.

All excavation shall be placed on one side of the trench, unless permission is given by the Engineer to place it on both sides. Excavation materials shall be so placed as not to endanger the work and so that free access may be had at all times to all parts of the trench and to all hydrants or water valve boxes, etc. All shade trees, shrubs, etc., shall be protected.

3.05 SUBGRADE STABILIZER

In the event that the subgrade under the pipe or other structures does not provide a suitable foundation for the pipe or other structure and when so directed by the Engineer, the said subgrade shall be stabilized with crushed stone.

3.06 ROCK EXCAVATION

Rock excavation shall comprise solid rock in the original bed, or well-defined ledges, the removal of which requires drilling, blasting or the use of jack-hammers and shall include all boulders, or detached pieces of rock, eight cubic feet or more in content.

Rock in trenches shall be excavated over the horizontal limits of excavation and to depths as follows:

<u>Size of Pipeline Inches</u>	<u>Depth of Excavation Below Bottom of Sewer Pipe, Inches</u>
4 and Less	4
6	6
8 to 18	8
20 to 30	10
Over 30	12

The space below grade for pipelines shall then be backfilled with #57 and smaller crushed rock, gravel, or other approved bedding material.

Blasting operations shall be conducted in strict accordance with all existing ordinances and regulations and shall be done by persons licensed to use explosives. No blasting shall be done less than 50 feet in advance of the completed work.

All exposed structures shall be carefully protected and where necessary, the blast shall be covered with suitable mats. Any damage caused by blasting shall be promptly repaired by the Contractor at his expense. Explosives and other blasting supplies shall be stored in accordance with all local ordinances and a watchman shall be stationed at the place of storage at all times.

3.07 LAYING PIPE FOR GRAVITY SEWER

All pipe and special fittings shall be of the dimensions and laid to the line and grade as shown on the plans and as established by the Engineer.

Pipe shall be laid with joints close and even, butting all around, special care being taken that there is no sagging at the hub and that a true surface is given to the invert throughout the entire length of the sewers.

Wyes and/or service connections and stubs from manholes shall be placed where shown on plans and as directed by the Engineer.

All such connections shall be blanked off with suitable stopper and made watertight with jute and cement mortar.

Bell holes must be dug so that the barrel of the pipe shall carry to load. After the pipe is laid, backfilling up to 12 inches above the top of the pipe shall be made of loose six inch layers of clean dry earth, thoroughly tamped with mechanical tamps between each layer.

The contractor will be required to provide and operate any equipment necessary to keep the trenches free from water while pipe is being laid and the joints made. The installed pipe shall not be used for draining water from the ditch.

Pipe grades shall be obtained by use of a laser and double checked with a surveying level and rod.

Completed sewer shall be tested between manholes with lanterns or reflected light and shall show at least 80% of the full circle of the pipe from manhole to manhole without obstruction.

Sewers shall be laid tight and the rate of infiltration in any section of line between adjacent manholes shall not exceed fifty (50) G.P.D. per inch diameter of pipe per mile of line, per 24 hour day when the trenches are saturated with water.

The Contractor shall be responsible for staking for both line and grade and the correctness thereof. The Engineer shall furnish benchmarks as shown on the plans.

3.08 MAKING OF JOINTS

When joining gravity sewer pipe, both the spigot end and the bell end of the pipe shall be perfectly clean and free from dirt, oil, grease, or other foreign matter.

The spigot end shall be lightly coated with the lubricant recommended and furnished by the manufacturer, and the pipe then shall be securely and firmly seated in the bell end of the adjoining pipe. In making the joint, the spigot end of the pipe, after being cleaned and coated with lubricant, shall not be allowed to touch the sides or bottom of the trench before being inserted in the bell end of the adjoining pipe.

In addition to the above, joints shall be made in strict accordance with the specifications and recommendations of the manufacturer.

ALL OPENINGS ALONG THE LINE OF THE SEWERS SHALL BE SECURELY CLOSED AT NIGHT, DURING SUSPENSION OF WORK, AND AT THE END OF EACH WORK PERIOD, WITH A WATER-TIGHT STOPPER.

NO LENGTH OF PIPE SHALL BE LAID UNTIL ONE PRECEDING IT SHALL HAVE SUFFICIENT QUANTITY OF FINE EARTH TAMPED AROUND IT TO HOLD IT FIRMLY IN PLACE.

3.09 BACKFILLING

As soon as joints have been completed, the bellhole under the hub, when necessary, shall be carefully and completely filled with sand or other selected material so as to hold the joints securely in place.

Backfilling shall be carried along as closely to pipe laying as possible. The maximum length of trench left open overnight shall not exceed three times the depth of the trench. All openings shall be surrounded by barricades at night with blinker lights not more than ten feet apart around the opening.

As each section of the line is completed, the trench shall be carefully backfilled. Outside of the roadway, the backfilling shall be placed in 6" layers and tamped so that after consolidation, the dry weight shall be not less than 90% of the maximum laboratory dry weight per cubic foot as determined by Standard Proctor Test. The soil in trenches within roadways and paved areas shall be compacted to a dry density of 100% Standard Proctor. The standard maximum dry density and the optimum moisture shall be determined by the same method.

3.10 BARRICADES AND WARNING SIGNS

The Contractor shall provide, erect and maintain all necessary barricades, suitable and sufficient red lights, danger signals and signs, provide sufficient number of watchmen and take all necessary precautions for the protection of the work and the safety of the public. Streets closed to traffic shall be protected by effective barricades on which shall be placed acceptable warning signs. All barricades and obstructions shall be illuminated at night, and all lights for this purpose shall be kept burning from sunset to sunrise.

3.11 CLEAN-UP AND MAINTENANCE

All surplus materials, tools, temporary structures, excess dirt, rubbish and debris shall be removed by the Contractor and the site of construction shall be left in a clean and neat condition, satisfactory to the Engineer.

After the work is accepted as a whole, the Contractor shall maintain the fences, grass and other disturbed surfaces until final acceptance of the project.

All labor and material required for such maintenance and/or repairs shall be furnished at no cost to the Owner, and the work shall be done in a manner satisfactory to the Engineer.

3.12 CONNECTION TO EXISTING FACILITIES

Connections to existing sewer lines and manholes shall be made at the various locations shown on the plans and as directed by the Engineer.

3.13 RIP-RAP

Stone shall be dumped and hand placed to form a compact layer. Stone rip-rap shall be placed to a thickness of not less than eight (8) inches and not more than 18 inches.

3.14 PROTECTION OF PROPERTY

The following provisions apply to protection and restoration of property in the vicinity of the project:

Unless otherwise noted, the Contractor is responsible for removal of trees within the construction easement as necessary for safe performance of the work, but only such trees as necessary shall be removed. Trees which are damaged by or later die as a result of the work shall be removed.

In the case of shrubs and ornamental trees smaller than three (3) inches diameter, the Contractor is responsible for either: (a) protecting these from damage, or (b) temporarily removing and then re-setting them without damage, or (c) replacing them with new stock of equal quality. The cost of this, if any, will be deemed included in the overall bid price.

In general, grass will be seeded over all areas as specified in section 02486 and all areas will be left in a neat condition, free of debris.

All property such as mailboxes, fences, signs, curb, paving, drain pipes, etc. shall be restored to original condition. Payment will be made only for those items that are listed in the bid proposal.

No property beyond the construction easement is to be altered, but if that does occur the Contractor will promptly remedy same at no cost to the Owner.

3.15 ACCEPTANCE TESTING

The Contractor will be required to furnish pipe plugs, weirs, cords, mandrels and any other customary devices needed to carry out the below-listed tests at no added cost. He will also furnish supervision and labor to carry out these tests in the presence of the Engineer at no additional cost.

Horizontal location. Horizontal location of the line will be checked by measuring "as-built" distances between manholes and bearings from manhole to manhole.

Elevation and slope. Elevation of each invert and top of manhole will be measured and recorded. Actual pipe slope will be computed and any segment having less than minimum allowable slope will be rejected and installed.

Manhole construction. Every manhole will be visually inspected to check for plugging of lift holes inside & outside, use of connecting boots, use of joint material, leakage, proper invert construction, proper setting of frame and cover.

Pipe straightness. Every section of sewer line will be visually checked for straightness. A passing section shall show at least 80% of a full circle when observed from one end. Any section which fails this visual test shall be further checked as follows:

The section shall have water run through it sufficient to fill any sags that may exist. Then it shall have a television camera pulled through it to check for sags. Any sag holding more than one and one-half inches of water will require that the pipe be removed and replaced to proper grade after which the section shall be televised again to verify correction.

Infiltration. The allowable limit for any section from manhole to manhole will be 200 gallons per day per inch of pipe diameter per mile of pipe. If any infiltration is present at the most downstream point, then it will be measured using a specially-made weir and measurements will also be made at each upstream manhole that has any visible flow of water. Any individual segment which exceeds the allowable infiltration shall be corrected to within allowable limits.

3.16 OTHER TESTING REQUIREMENTS

The tests listed below shall be performed by the Contractor during the presence of the Engineer. The City will be notified at least 2 days prior to these tests and may choose to be present.

A. Mandrel Test For PVC Pipe

Procedure for testing PVC sewer pipe for maximum allowable deflection shall be generally as follows (see ASTM specs for mandrel dimensions and more detail):

Completely flush the line making sure the pipe is clean of any mud or trash that would hinder the passage of the mandrel.

During the final flushing of the line, attach a floating block or ball to the end of the mandrel pull rope and float the rope through the line. (A nylon ski rope is recommended).

After the rope is threaded through line, connect the pull rope to the mandrel and place the mandrel in the entrance of the pipe.

Connect a second rope to the back of the mandrel. This will enable the mandrel to be retrieved if excessive deflection is encountered.

Draw mandrel through the sewer line.

An increasing resistance to pull is an indication of excessive deflection. If this occurs mark the rope to note the location. Televis the sewer section to identify the extent of the problem and develop a plan, subject to Engineer approval, for correcting the problem.

Retest:

Vertical deflection shall not exceed 5 percent of the undeflected diameter as defined in ASTM D3034, Table X1.1.

B. Air Pressure Test

A low pressure test of each sewer line section will be conducted by the contractor to check for leaks. The following general procedures will apply (also refer to ASTM specs):

1. Temporarily plug line segment between two manholes using plugs having air tight fittings through which low pressure air can be introduced into the pipe segment being tested.
2. Introduce low pressure air into the test pipe segment until the internal air pressure reaches 4.5 psig above ground water pressure, if any.

- C. Wait at least five minutes for air temperature in the test segment to stabilize while internal air pressure remains no less than 3.5 psig above ground water pressure.
- D. Bleed internal air pressure to exactly 3.5 psig above ground water pressure.
- E. Accurately determine the elapsed time for internal pressure to drop to 2.5 psig above ground water pressure.
- F. The air test is acceptable if elapsed time is no less than shown by the following table:

<u>Pipe Dia.</u> <u>Inches</u>	<u>Seconds Per</u> <u>100 Ft. of Pipe</u>	<u>Pipe Dia.</u> <u>Inches</u>	<u>Seconds Per</u> <u>100 Ft. of Pipe</u>
4	11	27	77
6	17	30	85
8	23	36	102
10	28	42	119
12	34	48	136
15	43	54	153
18	51	60	170
21	60	66	187
24	68	72	204

Air time is based on pipe being damp. If pipe and joints are dry, dampen line if helpful in meeting air test time requirement.

Permanently correct excessive leakage determined by air testing, and repeat operations until Engineer witnesses a successful test on each line segment.

3.17 PROTECTION OF TREES

The Contractor shall remove only such trees on or along the work as the Engineer permits, and shall carefully protect all other trees adjacent to the work. He shall not permit excavating machinery or if trees are damaged they shall be coated with an approved treatment.

3.18 INTERFERENCE WITH EXISTING STRUCTURES

All existing pipes, drains, or other structures on, above, or below ground shall be carefully supported and protected from injury and if injured, they shall be restored in a satisfactory manner by and at the expense of the Contractor.

3.19 INFORMATION CONCERNING CONDITIONS

The accuracy of information furnished by the Engineer and/or the plans and specifications as to underground and surface structures, foundation conditions, character of soil, position and quantity of ground and subsoil water, etc., are not guaranteed by the Owner. Bidders must satisfy themselves by personal examination and by such other means as they desire with respect to actual conditions in the nature of the ground and subsoil water and in regard to the locations of existing underground or surface structures. Unforeseen conditions shall not constitute a claim for increased compensation under the terms of the contract, nor constitute a basis for the cancellation thereof.

3.20 FENCE REMOVED AND REPLACED (ALL TYPES AND SIZES)

The Contractor shall take down fences on or crossing right-of-way for such periods of time only as are necessary to prosecute the work of clearing, grubbing, trenching, pipe laying and backfilling. Gaps made in fences shall be closed in a substantial manner at night and during any suspension of work, and upon completion of the pipe line, fences shall be restored to as good condition as before disturbed. No charges shall be made by the Contractor for any expense incurred in taking down or restoring fences, except where listed in the bid proposal.

END OF SECTION

SECTION 02742

TESTING FOR ACCEPTANCE OF SANITARY SEWER

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. The work consists of furnishing all labor, materials, accessories, equipment, tools, transportation, services and technical competence for performing all operations required to execute the internal closed circuit television survey to inspect the entire barrel of sewers up to 30 inches in diameter
- B. The survey shall show all defects and determine amount of infiltration entering the sewer system.
- C. One or more of the following tests and/or inspections may be required:
 - 1. Exfiltration of water
 - 2. Infiltration of water
 - 3. Exfiltration of air under pressure
 - 4. Television inspection
 - 5. Direct visual inspection
 - 6. Deflection Testing
 - 7. Vacuum Testing
- D. Prior to any testing, all lines shall be cleaned of debris and flushed clean. Debris shall be caught and removed from the line and shall not be flushed into existing live sanitary sewers.

1.02 TEST SECTIONS

- A. Unless otherwise specified or directed by the OWNER, the first section of sanitary sewer constructed of approximately 1200 feet in length or the entire length of the sewer if it is less than 1200 feet shall be tested by the exfiltration or infiltration or air testing method before additional excavation is permitted. An additional 1200 feet selected at random by the OWNER shall also be tested.
- B. The Contractor may at his option divide the first section of sewer into subsections of more convenient length for testing. If the section or subsection tested does not pass the tests, it shall be repaired, and the test repeated until a satisfactory test is obtained. Excavation shall not proceed

beyond the first 1200-foot section until test results for the entire 1200 feet are satisfactory.

- C. In the event the first 1200 foot section of sewer did not pass the test on the first trial (or if tested in subsections the first trial of each of the subsections did not pass) the next of sanitary sewer of approximately 1200 feet in length shall also be tested, repaired if necessary, and retested until a satisfactory test is obtained before additional excavation is started.
- D. When favorable test results are obtained on first trial on a full 1200-foot section of pipe, the Engineer may designate additional sections for testing as conditions in his opinion warrant. The Engineer reserves the right to select the location and lengths of additional test sections when construction operations or materials change, where construction difficulties indicate leakage or deflection may be present, or in sections selected at random.
- E. The Engineer shall notify the Contractor of the locations where a test is to be required not later than fifteen days after the sewer installation has been completed in the section to be tested. Unless otherwise authorized, the Contractor shall arrange to commence the test within fifteen days after the sewer has been installed or fifteen days after notification by the Engineer, whichever date is later.
- F. If the groundwater table is below the invert elevation of the sewer, the Engineer may at his discretion call for the entire sewer line to be air tested. No additional compensation will be allowed unless said work is listed in the proposal.

1.03 MEASUREMENT AND PAYMENT

- A. No separate measurement or payment will be made under this section.

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

3.01 TESTING METHODS

- A. All Testing Methods: All wyes, tees, and stubs shall be plugged with flexible jointed caps, or acceptable alternate, securely fastened to withstand the internal test pressure. Such plugs or caps shall be readily removable.
- B. Exfiltration Method Procedures: The section of sewer to be tested shall be sealed by inserting inflatable rubber bags in the pipes or by other means approved by the Engineer, and then water shall be introduced into a manhole until the section is completely filled. The Contractor shall fill the

pipe to the test level prior to the time of exfiltration testing to permit normal absorption into the pipe walls. Throughout the test period of at least two (2) hours, the water level in the upper manhole shall be maintained at least eighteen (18) inches above the crown of the upper end of the pipe or at least eighteen (18) inches above the groundwater table, whichever is higher. The length of pipe tested shall be limited so that the pressure on the centerline of the lower end of the section tested shall not exceed six (6) feet of water column.

C. Infiltration Method Procedures: The section of sewer to be tested shall have been trench backfilled and the test conducted by inducing infiltration conditions by jetting the sewer trench for a sufficient length of time to insure that the water level in the trench is a minimum of eighteen (18) inches over the crown of the sewer pipe. The test must be performed before existing sewers are connected and before wastewater flow is allowed in the sewers.

D. Air Testing Method Procedures: The section of sewer to be tested shall have been trench backfilled and cleared. Pneumatic plugs (having a sealing length equal to or greater than the diameter of the pipe to be tested) placed in both ends of the pipe to be tested shall be inflated to 25 psi or to such pressure as is necessary to completely seal the test pipe. The sealed sewer pipe shall then be pressurized to four- (4) psi above the average backpressure of groundwater over the sewer pipe and the air pressure allowed to stabilize for at least two minutes. After the stabilization period, the line shall be pressurized to 3.5 psi above the level of the ground water over the sewer pipe and the air pressure allowed to stabilize for at least two minutes. After the stabilization period, the line shall be pressurized to 3.5 psi above the level of the groundwater.

1. If the pressure drops 0.5 psi in less than the time given in the table below, the section of pipe shall have failed the test.

Sewer Size (Inches)	Minimum Test Time/100 ft (Seconds)
8	72
10	90
12	108
15	126
18	144
21	180
24	216
27	252
30	288

2. If the time for the pressure to drop 0.5 psi is 125 percent or less of the time given in the table, the line shall immediately be re-pressurized to 3.5 psi and the test repeated.
 3. The pressure gage used shall be supplied by the Contractor and have minimum divisions of 0.10 psi and be oil filled.
- E. Lamping shall be performed on all sewer pipeline by the Engineer.
- F. Television inspection of new sewers shall be conducted in accordance with the requirements of this section.
- G. MANHOLE TESTING
1. All manholes and manhole inserts shall be tested by the Contractor using the vacuum testing method, following the manufacturer recommendations for proper and safe procedures. Vacuum testing of manholes and structures shall be performed after installation of inserts, if required. Any leakage in the manhole or structure, before, during, or after the test shall be repaired by the Contractor.
 2. All pipes for vacuum testing entering the manhole shall be installed at the top access point of the manhole. A vacuum of ten (10) inches of mercury (Hg) (five (5) psi) shall be drawn on the manhole, and the times shall be measured for the vacuum to drop to nine (9) inches of mercury (Hg) (four point five (4.5) psi). 1. Manholes will be considered to have failed the vacuum test if the time to drop one (1) inch of mercury (Hg) is less than what is shown in the following table.
 3. Manhole depths shall be rounded to the nearest foot. Intermediate values shall be interpolated. For depths above 20 feet, add the values listed in the last line of the table for every two- (2) feet of additional depth.
 4. If the manhole or structure fails the vacuum test, the Contractor shall perform additional repairs and repeat the test procedures until satisfactory results are obtained.
 5. After the manhole work has been completed, the manhole will be visually inspected by the Contractor in the presence of the Engineer and the Work shall be accepted if found satisfactory to the Engineer. No evidence of visible leaks shall be allowed.

3.02 ALLOWABLE TESTING LIMITS FOR SANITARY SEWERS

- A. All pipe joints shall be as near watertight as possible and as it is practical to construct them with the materials specified in these specifications.

- B. No infiltration and exfiltration of ground water or other leakage into or out of the sewer shall be allowed during the 24-hour test period.
- C. Any visible or audible leaks into the sewer that can be located shall be repaired or corrected as directed by the Engineer.
- D. Air leakage tests shall be performed in accordance with ASTM specification C-828.

3.03 TELEVISION INSPECTION PROCEDURES AND METHODS

A. GENERAL

1. All photographs and videotape recordings made in performance of said television inspection shall become the property of the Owner and shall be delivered to the Owner immediately upon completion of said inspections.
2. The Contractor shall furnish the mobile television inspection studio, all television equipment and other necessary types of equipment, and all materials, electricity, labor, and technicians, as may be needed to perform the closed circuit television inspection of the sewers for final inspection. The television inspection shall be conducted in such a manner that the television control technician or the Engineer can determine that the sewer line is clean, so that all leaking joints, pipe breaks, line sags or dips, and service connections can be accurately seen and located within and along the sewer line.
3. The television camera used for the sewer line inspection shall be one specifically designed and constructed for such inspection work. Lighting for the camera shall be adequate and suitable, and adjustable to allow a clean picture of the entire periphery of the pipe. The camera shall be capable of 360° viewing angle. The camera shall be waterproof and shall be operative in 100 percent humidity conditions. The camera, or cameras, shall be small enough to pass through and clearly televise the interior of a six (6) inch diameter sewer and all larger sewer sizes up to and including a thirty-six (36) inch diameter sewer. The camera focal length or distance shall be adjustable through a range of six (6) inches to infinity. The television camera shall be capable of transmitting a picture having not less than 600 lines of resolution. The camera shall be equipped with a device that indicates the camera travel distance in feet by display on the video-viewing screen. The camera, television monitor, and other components of the video system shall be capable of producing picture quality to the satisfaction of the Engineer; and if unsatisfactory, equipment shall be removed and no payment shall be made for an unsatisfactory inspection.

4. The view seen by the television camera shall be transmitted to a monitor of not less than eleven (11) inches in size. The television monitor shall be capable of receiving and displaying a picture having not less than 600 lines of resolution. The television monitor shall be located inside the mobile television studio. The picture shall be free at all times of electrical interference and shall provide a clear, stable image having the number of lines of resolution specified.
5. The mobile television studio shall be large enough to accommodate up to six people for the purpose of viewing the monitor while the inspection is in progress. The Engineer or his representative shall have access to view the television screen at all times. The central control panel and television camera control shall all be located in the mobile television studio. The television studio shall be mounted on a mobile device (truck or trailer), that will allow safe and orderly movement of the inspection equipment throughout the job site.
6. The Contractor shall furnish all equipment required for taking instant photographs of the view that appears on the monitor. A camera having the proper lenses and mountings as required to properly frame the monitor shall be available for making these photographs. Pictures which include less than the total screen area or which extend appreciably beyond the total screen in width or height will not be acceptable.

B. OPERATION OF TELEVISION EQUIPMENT

1. The operation of the television equipment shall be controlled by a skilled technician or supervisor who shall be located at the control panel in the mobile television inspection studio. The control of the television equipment may be accomplished by means of remote control winches or by telephone or other suitable means of communication between the television control technician in the mobile television studio and the technicians operating the winches at either end of the manhole section being inspected. The control technician in the mobile television studio shall, at all times, be able to move the television camera through the sewers in either direction without loss of quality in the video presentation of the television monitor. The television image on the monitor shall, at all times, be free of electrical interference and shall provide a clear stable image and picture. When directed to do so by the Engineer, the television camera shall be stopped and/or backed-up as required so the Engineer or television control technician can view and analyze and photograph. The travel speed of the television camera (through the sewer) shall be uniform and shall not exceed that maximum speed directed by the engineer (30 feet per minute under normal conditions). Any means of propelling the camera

through the sewer which produces non-uniform rates of speed or which results in a speed faster than that specified by the Engineer will not be acceptable. The television control technician shall be able to adjust the brilliance of the lighting system (built into the television camera) and be able to change the focus of the television camera by remote control. Measurement of the exact location of any sewer line defects. (I.e., breaks, sags, leaks obstructions, etc.) shall be at ground level by means of a metering device. Markings on a cable, or the like, which would require interpolation for the depth of manhole, will not be allowed. Measurement meters shall be accurate to two-tenths (0.2) of a foot. A measuring target shall be used as an exact measurement reference point, and the meter reading shall show the exact location of this measurement.

2. Where obstructions within the sewer line prevent the passage of equipment (i.e., television camera and other equipment), the Contractor shall reset his equipment to pass through the section from the other end and thereby complete the inspection of that section when possible. When section having obstructions that prevent completion of the television inspection are encountered, the crew shall abandon this section and go on to the next section. After the obstruction has been removed, the television inspection crew shall return and complete the inspection.
3. During the course of the inspection the Engineer shall select the specific views which are to be photographed. These photographs shall be of a quality and definition comparable to the monitor display. The photographic record shall include the photograph number, the location of the photograph in the identified manhole section (to the nearest foot), and the corresponding TV inspection report number. This same information shall be recorded on the back of each photograph in indelible ink.
4. Continuous videotape recordings of the inspection view as it appears on the television monitor shall be taken. It is intended that a videotape recording will be made of the complete television inspection of all the sewer lines constructed as a part of this project. Where the television inspection shows that the sewer line has occasional bad features or items, said occasional bad features shall be photographed and that these photographs shall be used as the permanent record of said bad features. The videotape recording shall also be used as the permanent record of said bad features. The videotape recording shall be made on one half- (½) inch, one (1) hour spools of seven point five (7.5) IPS tape or other approved equal. The videotape recorder shall be one on which both sound and video information can be reproduced with a video image equal to or better than the quality of the original picture on the television monitor. The composite video and the audiotape recording of the sewer line inspection shall conform to EIAJ, Type

I, standards. The replay of the recorded video information, when reviewed on a monitor-receiver, shall be free of electrical interference and shall produce a clear, stable image with a horizontal resolution equal to that of the television monitor in the television inspection studio. The audio portion of the composite signal shall be sufficiently free of electrical interference and background noise to produce an oral report that is clear and completely and easily discernible. The audio portion of the tape report shall be recorded by the operation technician on the audio-video tapes as they are being produced and shall include the location or identification of the section, the manhole-to-manhole direction of travel, and the distance traveled on the specific run encountered. Dubbing the audio information onto the video tract after the internal television inspection is completed will not be permitted. The videotaping equipment shall be continuously connected to the television inspection or monitoring equipment. The videotaping and monitoring equipment shall have the built-in capability to allow the Engineer and technician to instantly review both the audio and video quality of the videotape productions at all times during the television survey. Playback speed shall be continuously adjustable from one-third normal speed for slow-motion viewing to normal playback speed. Videotape recordings shall be enclosed in vinyl plastic containers that shall clearly indicate the date the tape was taken, the designated section(s) of sewer lines contained on the tape, and the referenced sewer inspection report covering the sections of the sewer lines so included.

3.04 TELEVISION INSPECTION RECORDS

- A. The Contractor shall keep a daily log or record covering the television inspection work and the information acquired. This daily log or record will contain at least the following data:
1. Date and Time
 2. Sewer Line Location (Street Name and Manhole-to-Manhole Numbers, etc.)
 3. Size and Length of Line, Type of Material Line is made of, etc.
 4. Name of Television Control Technician or Supervisor in charge.
 5. Name of Engineer or other County Representative at the job site.
 6. Cleanliness and general condition of pipe.
 7. Sewer service line locations, type (Y or T), position on the periphery of the pipe and condition.

8. Pipe damage and character, type and location of such damage.
 9. Any infiltration points location from manhole, location on periphery of the pipe, estimate of the amount of infiltration in gallons per minute (GPM), and a description of the infiltration point (i.e., joint, break, hole, etc.).
 10. Photographs acquired (photo, location, etc.)
 11. Videotape (locations, etc.)
- B. One copy of the log or record shall be given to the Owner at the completion of the work.

END OF SECTION

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION Section 754 –0000 Outdoor Furniture

PART 1 - GENERAL

1.01 SUMMARY

- A. This work includes furnishing, fabricating, and installing outdoor furnishings as shown on the plans, and shall include, but is not limited to, the following components:
 - 1. Bench
 - 2. Bicycle Repair Station
 - 3. Bike Rack
 - 4. Trash Receptacle

1.02 RELATED REFERENCES

- A. Drawings and general provisions of the Contract, including General Conditions and Standard Specification sections apply to this Section.

1.03 PRE-INSTALLATION MEETING

- A. Preinstallation Conference: Conduct conference at Project Site.

1.04 SUBMITTALS

- A. Product Data: Contractor shall submit manufacturer's technical data for each type of product. This information shall include installation instructions, material descriptions, dimensions of individual components and profiles, sizes, colors, finishes, anchoring method, and field-assembly requirements.
- B. Samples: Contractor shall submit actual material color and finish samples. Size of samples to be not less than 6-inches long for linear components and 4-inches square for sheet components.
- C. Project Schedule: For outdoor furnishings. Use same designations indicated on Plans.
- D. Material Certificates: For outdoor furnishings, signed by manufacturers.
- E. Maintenance Data: For outdoor furnishings, to include in maintenance manuals.

1.05 QUALITY ASSURANCE

- A. Manufacturer shall have a minimum of 10 years' experience in designing, fabrication, and installing the specified outdoor furnishings.
- B. Installation shall be performed by a qualified installer.

1.06 WARRANTY

- A. Manufacturer warrants that outdoor furnishing unit shall be free from defect in parts and manufacture for a period of one year.
- B. Manufacturer shall maintain inventory of replacement parts for minimum of ten years after delivery of outdoor furnishing.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Refer to Construction Documents for Material and Manufacturers.

2.02 FABRICATION

- A. Metal components: Form to required shapes and sizes with true, consistent curves, lines, and angles. Separate metals from dissimilar materials to prevent electrolytic action.
- B. Welded Connections: Weld connections continuously. Weld solid members with full-length, full-penetration welds and hollow members with full-circumference welds. At exposed connections, finish surfaces smooth and blended so no roughness or unevenness shows after finishing and welded surface matches contours of adjoining surfaces.
- C. Pipes and Tubes: Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of handrail and railing components.
- D. Steel and Iron Components: Galvanized, galvanized and color coated, or color coated. Bare metal steel or iron components are not permitted.
- E. Exposed Surfaces: Polished, sanded, or otherwise finished; smooth all surfaces, free from burrs, barbs, splinters, and sharpness; all edges and ends rolled, rounded, or capped.
- F. Factory Assembly: Assemble components in the factory to the greatest extent possible to minimize field assembly. Clearly mark units for assembly in the field.

2.03 FINISHES - GENERAL

- A. Compliance: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in

the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast..

2.04 DELIVERY, STORAGE, AND HANDLING

- A. Acceptance at site: Coordinate delivery of work to Project site under this section for immediate installation. Outdoor Furnishings shall be delivered fully assembled.
- B. Store Materials in clean, dry area in accordance with manufacturer's instructions. Keep materials in original, unopened containers and packaging until installation. Do not store in direct contact with the sun or rain.
- C. Handling materials and equipment: Handle outdoor furnishings in careful manner in order not to damage or mar surfaces finishes.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for correct and level finished grade, mounting surfaces, installation tolerances, and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION - GENERAL

- A. Comply with manufacturer's written installation instructions, unless more stringent requirements are indicated. Complete field assembly of outdoor furnishings, where required.
- B. Unless otherwise indicated, install outdoor furnishings after landscaping and paving have been completed.
- C. Install outdoor furnishings level, plumb, true and securely anchored at locations indicated on the Plans.

3.03 CLEANING

- A. After completing outdoor furnishing installation, inspect components. Remove spots, dirt, and debris. Repair damaged finishes to match original finish or replace component.

3.04 MEASUREMENT

- A. The accepted outdoor furniture quantities are measured in per each fixture in place in the completed work.

3.05 PAYMENT

- A. Outdoor furniture is paid for at the unit price bid per each unit complete and in place as specified. The payment is full compensation for all excavation, furnishing and installation of each unit, including foundation / footing, anchoring units, disposal of excavated material, and the cost of furnishing all tools, safety devices, labor, equipment and all other necessary items to complete the work.

END OF SECTION

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION SECTION 104-000 SUMMARY OF WORK

Summary of Work

104.1 General

Spirit and Intent:

It is the spirit and intent of the Special Provisions to accompany the GDOT Technical Specifications and the Construction Documents and to provide clarification and describe the work and all parts thereof that shall be fully completed and suitable in every way for the purposes for which they are designed. Mention in the Special Provisions or indications on the Drawings of articles or materials, operations or methods requires that the Contractor provide each item listed, of quality or subject to qualification notes; perform according to conditions stated each operation prescribed; and provide therefore all necessary labor, materials, tools, equipment and incidentals to complete the work as indicated.

The Construction Documents, GDOT Technical Specification and Special Provisions are intended to be mutually explanatory and complete; all work called for by one, even if not by the other, shall be fully executed. Detailed drawings shall take precedence over small scale drawings. In case of discrepancy, either in the figures, in the Construction Documents, GDOT Technical Specification and or the Special Provisions, the matter shall be promptly submitted to the Owner/ Project Manager prior to bid. Any adjustment by the Contractor without this determination shall be at his own risk and expense.

THE CONTRACTOR SHALL OBTAIN FROM THE CITY OF CANTON A LAND DISTURBANCE PERMIT PRIOR TO ANY WORK. A copy of this permit shall be issued to the Owner's Representative for its records. The Contractor shall also confirm prior to encroachment into the GDOT Right of Way and the State Stream Buffer, that both the State Encroachment Permit and State Stream Buffer Encroachment Permit have been obtained by the City of Canton.

The Contractor is required to coordinate and cooperate with any and all other Contractors working for the City, in order that all work is installed in a timely an expeditious manner.

104.1.01 The **Scope of Work** includes, but is not limited to, the following:

- A. Furnish, install and MAINTAIN until Final Acceptance, and remove upon acceptance of the Work all necessary Erosion Control Measures including; but not limited to, Filter Sock, Inlet Sediment Control, Temporary Grassing and Tree Protection Fencing and any other miscellaneous items as indicted within the Contract Documents or required per all applicable standards.
- B. The related requirements shall include but is not limited to; the saw cutting of pavement surfaces, the removal of concrete and stone curb, the removal of existing concrete and asphalt pavements and base material, clearing of existing landscape plant material and vegetation, including stump removal.
- C. Contractor shall be required to install new concrete curbing, concrete sidewalk, concrete, concrete pavers and stone driveway surfaces, boardwalk, traffic control signage, pavement markings, railings, gates, landscape, and all the miscellaneous items that are required for the performance and completion of this project as noted and indicated within the Contract

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION SECTION 104-000 SUMMARY OF WORK

Documents, Technical Specifications and Special Provisions.

- D. The Contractor shall provide Grading Complete to construct the project. Grading Complete shall include but is not limited to the Contractor providing the necessary clean backfill material to complete the construction shoulder including; the curbing, sidewalk, driveways and slope improvements in accordance with the construction documents.
- E. The Contractor shall remove all unsuitable material (**including stripping's, and other debris, or other construction materials identified within the Contract Documents**) within the Project limits (including any stripping's generated from the creation of any material stockpile locations). **All construction debris must be properly disposed of offsite on a daily basis.**
- F. **The Contractor shall not be permitted to temporarily stockpile any excess stripping's or unsuitable materials within the rights of way.** Temporary stockpile(s) within the project limits shall not be allowed. The Contractor shall provide erosion control measures around storm inlets and temporary excavation holes or debris (to prevent impact to adjacent roadways, lands and water bodies. Any temporary stockpiles must be removed daily.
- G. Contractor shall Replace all damaged landscape, sodding, mulch and seeding impacted from the construction activities.
- H. Contractor shall provide and maintain all Traffic Control items and 'maintenance of traffic' items which may become necessary due to the installation or maintenance required to perform its work.
- I. The Contractor **will clean-up daily ALL roadways of mud or dirt tracked out because of construction activity.**
- J. All holes, pits and demolition areas shall be protected and maintained to provide a safe working area in conformance with the GDOT and OSHA or other applicable standards. Provide, maintain, remove and dispose of any temporary sheeting and/or shoring required upon completion of its work. Should it be required, **all temporary sheeting and/or shoring shall be designed and sealed by a Georgia Registered Professional Engineer.**
- K. Provide all necessary temporary supports required to protect all existing utility systems prior to commencing and during the work. All damage to existing facilities during construction will be repaired at the Contractor's expense. Temporary supports shall be reviewed by representatives of the respective utility company prior to installation by the Contractor.
- L. Provide all labor, material, and equipment necessary to perform all temporary traffic and pedestrian signage, including but not limited to: flaggers, signage, and control devices, required for the performance of the Work, or requested by the Owner's Representative.
- M. Provide and maintain ALL 'maintenance of traffic' control items as required for the performance of Work.
- N. Provide all labor, material, and equipment necessary to install all improvements as indicated within the Contract Documents.

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION SECTION 104-000 SUMMARY OF WORK

- O. Provide all necessary reinforcing steel, wire mesh and accessories as shown, specified or required for the sidewalk, curb, wall and driveway improvements.
- P. Provide all labor, material, and equipment necessary to perform all concrete work, including the installation of graded aggregate base under paving material and including all Class B pavement widening.
- Q. Provide all demolition, removal and disposal off the project site, of existing concrete paving, pavers, and any other miscellaneous items as noted within the Contract Documents or required for the performance of the Work. All debris resulting from the demolition activities shall be deposited off the project property, at the Contractor's cost.
- R. The Contractor shall be responsible for dust control as it pertains to its work or its work which adversely affects adjacent existing facilities, operations and occupants.
- S. The Contractor is responsible for all necessary temporary water detention/retention basins, turbidity control, silt screens, etc., for construction site water run-off control. The Contractor is advised that should any of the adjoining ponds, lakes, wetlands, or streams become contaminated due to his actions or inaction, if Owner directs the Contractor to do so, Contractor shall flocculate, clean, or restore by any other means, these ponds, lakes, wetlands, or streams and all such costs will be paid by this Contractor regardless of the party performing this Work. Any fines and/or penalties assessed for contamination of these water bodies due to the Contractor's actions or inactions shall be paid for by the Contractor.

104.1.02 The **Work** includes, but is not limited to, all labor, materials, equipment, tools, machinery, construction facilities and temporary shoring and controls, transportation and other facilities and services necessary to produce the construction required by the Contract Documents as follows:

- A.** Drawings as listed in the Drawings' Index.
- B.** GDOT Technical Specifications and Special Provisions as listed in the Table of Contents for the Project Manual.
- C.** Pay legally required sales, consumer and use taxes.
- D.** Secure and pay for, as necessary for proper execution and completion of Work:
 - 1. All permits.
 - 2. Government fees.
 - 3. Licenses and applications.
 - 4. Electrical permits.
- E.** Give required notices.
- F.** Comply with laws, codes, ordinances, rules, regulations, orders, and other legal requirements of public or quasi-public authorities which bear on performance of the Work.

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION SECTION 104-000 SUMMARY OF WORK

- G.** Enforce strict discipline and good order among employees. Do not employ for Work:
1. Unfit persons.
 2. Persons not skilled in assigned tasks.
- H.** Coordinate activities with other contractors.
- I.** Maintain site access for other contractors using the site.
- J.** Temporary services for construction purposes, required to perform this Contractor's work, including portable toilet facilities for the duration of this Contract, shall be by this Contractor.
- K.** All necessary flagmen, barricades, warning flashers, etc., for safe and proper traffic control. When public roadways are used, the Contractor will coordinate his operations with the City of Canton. The Contractor is advised that he is responsible for all construction personnel and traffic routing logistics required in the performance of his Work. Cost of these services and materials is included in this Contract.
- L.** This Contractor shall provide (where applicable to his Work) the following:
1. All surveying, engineering and layout required to complete the project.
 2. Including All "rough" and "finish" grade stakes required to perform his Work. Re-staking required due to this or any other contractor damaging or removing original stakes shall be performed by this Contractor and is not the responsibility of the Owner.
- M.** Provide all necessary temporary supports and shoring required to protect all existing utilities prior to commencing the Work. All damage to existing utilities during construction will be repaired at the Contractor's expense. Temporary shoring and/or supports of utilities, if required, are to be reviewed by the Utility Company prior to installation.
- N.** It is incumbent upon each Contractor to coordinate and cooperate with all other Contractors in order that all work is installed in a timely and expeditious manner.
- O.** The Contractor is advised that work associated with this Construction Package may have to be performed during "off" working hours and shall include these costs within his Construction Proposal accordingly. No additional compensation will be provided for work required to be performed during "off" working hours.
- P.** The Contractor will be working along roadways which are presently open to the public and must, therefore, exercise care in performing work along said roadways so that access for the public is **not** interrupted.
- Q.** Perform all Work in accordance with the specified hours of Work indicated within the Contract Documents.
- R.** The Contractor and his subcontractors will be responsible for, and required to, accomplish their own clean-up daily or more frequently as conditions dictate or as directed by the Owner's Representative. This Contractor will clean-up daily all roadways of mud or dirt tracked out

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION SECTION 104-000 SUMMARY OF WORK

because of his Work.

S. Provide all safety precautions and equipment to ensure conformance to all safety regulations.

T. During the work of this Contract, if the Contractor shall impact and existing irrigation system, the Contractor cut and cap irrigation system one foot behind the proposed sidewalk.

104.2 General Clarifications

104.2.01 The existing grade elevations and utility locations as depicted on the Contract Drawings are not to be construed as absolute; should the Contractor notice any discrepancies between the drawings and the existing conditions, such discrepancies shall be pointed out to the Owner's Representative, by the Contractor, before the starting the construction activity.

104.2.02 The Contractor shall take no advantage of any apparent error or omission in the Plans or Specifications. In the event the Contractor discovers such an error or omission, he shall immediately notify the Engineer. The Engineer will then make such corrections and interpretations as may be deemed necessary for fulfilling the intent of the Plans and Specifications.

104.2.03 Flagmen and appropriate signage will be required at all on-site/off-site off-road accesses unless otherwise approved by the Owner. Maintenance of the off-road accesses will be the responsibility of the Contractor as well as repair to hard road surfaces and subsurface damaged because of the Work.

104.2.04 Maintenance and dust abatement of all areas of Work provided by the Contractor shall be done in a manner acceptable to the Owner.

104.2.05 The Contractor will be responsible for safely barricading open excavations that may present hazards. Special attention is noted that during the performance of this scope of work, the private residences and adjacent school shall be occupied, as such, the Owner shall require the Contractor to pay special attention to this issue.

104.2.06 All connections of new Work or utilities to existing that is to be accomplished by the Contractor must be scheduled at least 24 hours in advance, accomplished in a manner and at a time acceptable to the Owner.

104.2.07 Debris, because of construction and/or miscellaneous demolition Work required by the Contract Documents, is to be hauled off and disposed of in a manner acceptable to the Owner.

104.2.08 Logistical routing and methods of interfacing with existing road systems will be subject to approval by the Owner.

104.2.09 All maintenance to construction equipment on-site that may be considered by the Owner to contaminate the existing earth will not be permitted.

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION SECTION 104-000 SUMMARY OF WORK

- 104.2.10** All existing conditions off the immediate Project site which are disturbed due to Contractor's activities must be repaired to pre-construction conditions.
- 104.2.11** The Contractor's attention is directed to the fact that this project site has existing underground utilities located within and adjacent to the limits of construction. The Contractor shall be required to coordinate his operations with these existing facilities and to provide all means necessary to protect these facilities during construction. Any damage to the existing utilities services will be at the contractor's expense.
- 104.2.12** Prior to construction, the Contractor shall contact and notify the applicable utility companies and coordinate the schedule of construction activities near the existing electrical transmission lines, electrical distribution lines, gas, transmission and communications distribution lines.
- 104.2.13** Prior to construction, the Contractor shall submit a plan to the Owner and utility company showing the proposed methods of protection for all existing utilities. No construction may commence until the plan has been accepted by the applicable utility company.
- 104.2.14** All temporary sheeting and/or shoring required to perform this Work is a requirement of this Contract and shall be included in the Bid as appropriate. Temporary sheeting and shoring shall be signed and sealed by an Engineer registered in the State of Georgia.
- 104.2.15** Throughout the duration of this Contract, other Contractors and other entities may be working within the construction limits of the Project. The Contractor shall coordinate his construction activities with all other contractors working within the Project Limits.
- 104.2.16** The Contractor must notify utilities companies prior to commencement of field operations to verify the horizontal and vertical locations of utilities and related systems. Utilities that may be present include, but are not limited to, the following:
- 104.2.17** It is the Contractor's responsibility to notify utilities and arrange for locator service prior to construction operations. Damage to any utilities and interruption of service shall be the responsibility of the Contractor should it fail to properly notify utilities of its work or cause damage to facilities owned and/or operated by others.
- 104.2.18** The Contractor shall be responsible to consolidate and secure all equipment and materials at the job site. The Owner's current intent is to NOT provide security for material and equipment stored on site for contractors working at the Project site.
- 104.2.19** The Contractor is responsible to schedule, coordinate, and comply with all Owner, County, State, and utility provider requirements for connections to and inspections of the Work.

104.3 Owner-Furnished Products

NONE.

104.3.01 Owner's duties:

- A.** Review of Shop drawings

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION SECTION 104-000 SUMMARY OF WORK

104.3.02 Contractor's duties:

- A. Designate required delivery date for each product in construction schedule.
- B. Promptly inspect delivered products, report damaged or defective items.
- C. Repair or replace items damaged because of Contractor's operations.
- D. Obtain installation drawings and instructions.
- E. Properly install, connect, and provide all finishing work for completion of each product or item of equipment being relocated in strict accord with manufacturer's installation instructions and technical bulletins.

104.4.01 Examination of Site

Before submitting bids for the work, each bidder shall be held to have examined the premises and satisfied himself as to the existing conditions under which he shall be pledged to operate or that in any manner shall affect the work. No allowance shall be made subsequently in this connection in behalf of the Contractor for any error or negligence on his part.

104.5.01 Landscape Protection

Tree Save Fence and Sediment Control (Filter Sock) is proposed at all boring location and limit of work. The Tree Save Fence shall not be removed and shall be carefully protected by the Contractor through the entirety of the project. As part of this project there are trees proposed to be removed. The stumps and roots of trees that are noted to be removed shall be removed. Damage to any existing vegetation and landscape material including; trees and shrubs, ground cover, sod, perennials and other landscape material items not identified, will be replaced at the contractor's expense.

104.6.01 Layout of Work

The Contractor shall provide all surveying, engineering and layout required for his work, including All "rough" and "finish" grade stakes required to perform his Work. Re-staking required due to center line adjustments by the engineer or other contractor damaging or removing original stakes shall be performed by this Contractor and is not the responsibility of the Owner.

Before commencing any work, the Contractor shall indicate all layout all proposed material in the field for review and approval by the Owner. The Contractor shall stake the entire project including offsets and proposed elevations/grades. The locations of the staking shall be accurate. This stakeout shall be made early in the construction process and preserved for reference during construction. The purpose of the staking, with inspection and adjustment by the Engineer. Engineer is to potentially adapt the design layout to the site rather than allow the design to be forced upon the site. This variation is an aesthetic decision, the amount of adjustment most often determined by the existing trees, terrain, soil conditions, utilities, sub-surface water and by other intangibles which are impractical to survey in absolute accuracy.

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION SECTION 104-000 SUMMARY OF WORK

The Contractor shall notify the Engineer at least two (2) working days before inspection of the stakeout. During the inspection, the Engineer may adjust the stake-out as necessary. At this time, the Engineer will clearly confirm all proposed element locations and mark any corrections. The staking inspection process shall be repeated for any work not staked and approved or adjusted during the first site visit. No work shall ever be done without the stakeout first being approved by the City Engineer. Any work progress delays caused by inadequate, incomplete or improper staking shall not merit an extension of the contract or delay charges by the Contractor. The City Engineer shall have a minimum of two (2) workdays to resolve any problems created by unknown conditions discovered during the stakeout or construction.

The Contractor shall be responsible for adequately scheduling his process to allow constant work to continue. When unknown conditions inhibit the flow of work in a specific location, during the inspection, the Contractor shall continue unhindered portions elsewhere on the project and notify the Engineer immediately.

104.7.01 Geotechnical and Material Sampling Assistance

The Contractor is required to provide geotechnical and material testing services in accordance with the GDOT and City of Canton requirements. The Contractor shall hire and coordinate with a GDOT prequalified geotechnical engineer for material testing services associated with the project. Including, but not limited to checking, testing of soil compaction, concrete sampling and steel reinforcement. The geotechnical engineer shall be concerned with construction methods necessary to prevent settlement or failure of walkways, foundations, and/or damage to such surrounding structures as sidewalks, roads, utilities, within the public rights of way. Geotechnical and Material Sampling Assistance shall be provided in accordance with GDOT specifications. All geotechnical reports shall be provided to the City of Canton. During the construction process, the City of Canton may have an independent geotechnical engineer performing geotechnical test as well to verify results.

104.8.01 Utilities

The Contractor shall exercise extra precaution to avoid damage to underground utilities, The Contractor shall notify the utility locating service to flag and mark with paint all underground utilities before any work commences. The Contractor shall determine the exact location of all existing utilities, structures and underground utilities, which may not be indicated on the drawings, and he shall conduct his work to prevent interruption of service or damage to them. The Contractor shall protect existing structures, utilities and underground utilities and be responsible for their replacement if damaged by him.

The Contractor, at his expense, shall immediately repair existing irrigation and utility lines impacted on site. This may include cables, duct banks, conduits and piping damaged by Contractor's operations. Unless they are to be abandoned, protect and or maintain in use until relocation of same has been completed or shall be cut and capped where directed or shall be prepared for service connections when so required by the City Engineer.

104.9.01 Inclusion of Accessories

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION SECTION 104-000 SUMMARY OF WORK

Unless specifically mentioned otherwise, all anchors, bolts, screws, fittings, fillers, hardware accessories, trim and other parts required for, or in connection with, full operation of the project, shall be furnished and installed by the Contractor as part of the project installation whether shown on the drawings or specified.

104.10.01 Installation and Protection of Materials

All items shall be installed in a workmanlike manner in accordance with the best recognized practice of the trade. Manufactured items shall be installed in strict accordance with the manufacturer's printed directions, specifications and recommendations. All working parts shall be properly adjusted after installation and left in perfect working order. Unless otherwise indicated, items exposed to weather and subject to flooding shall be installed to shed water. Items in all cases shall be installed plum and true and in proper relation to surrounding materials. The Contractor shall be responsible for preparing samples as required in the Specifications and to obtain approvals prior to construction of the item.

All materials shall be shipped, stored and handled in a manner that will afford protection and ensure their being in first class condition at the time they are incorporated in the Work. After installation, all materials shall be properly protected against damage to ensure their being in first class condition when the project as a whole is completed and accepted by the Owner.

104.11.01 Reference to Standard Specifications

When standard specifications such as the American Society for Testing and Materials, Federal Specifications, Department of Commerce (commercial Standards), American Institute of Steel Construction, American Association of State Highway and Transportation officials (AASHTO) guidelines, or other well-known public or trade associates are cited as a standard to govern materials or workmanship, such specifications or portions thereof as referred to shall be equally as binding and have the full force and effect as though it were copied in the Specifications. Such standards as are mentioned are generally recognized by and available to the trades concerned.

104.12.01 Reference to Manufacturer's Publications

Unless otherwise specifically stated, all manufacturer's catalogs, specifications, instructions or other information or literature that are referred to in the Specifications shall be considered as the latest edition or revision of such publications that is in effect on the date of the Invitation or Advertisement for Bids.

104.13.01 Materials Furnished by Others

Owner-Furnished Materials: There are no Owner furnished materials for this project. Whenever Contractor or any subcontractor shall receive items from another contractor, the Contractor or subcontractor shall give receipts for items delivered, and any necessary replacement of items received. No adjustment will be made to contract price for increased insurance premiums, and not listed as such in other contract documents.

104.14.01 Substitute Materials and Equipment

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION SECTION 104-000 SUMMARY OF WORK

Approval by the City Engineer of substitute materials and equipment shall not relieve the Contractor from his responsibility to supply and install any additional materials, equipment or labor required to make the substitution properly function within the intent of the contract documents as issued for bid whether recognized by the City Engineer or Contractor. The Contractor shall supply and install such required substitutions at no additional cost to the Owner.

104.15.01 Protection of Existing Structures

The Contractor shall be liable for all damage to existing structures that occur because of his negligence to provide proper and adequate protective measures, including but not limited to buildings, walls, fences, paving, conduits, furniture, pipe, wiring, drains, underground utilities and equipment. The Contractor shall be liable for all damage to trees, shrubs, turf, and other vegetation; see Tree Penalty Clause in Specifications. The Contractor shall not encroach on neighboring properties or damage fences or vegetation that is not identified for removal in the construction documents.

104.16.01 Record of Construction Changes and As-Built Drawings

On completion of work, the Contractor is required to provide an As-Built Survey of the proposed improvements including; locations and any other modifications that may be required because of implementing the project. The data shall be provided to the owner in Auto-Cad (version 10 format). The As-Built plans shall include location of sidewalk and any other proposed improvements as part of this contract.

104.17.01 Maintenance

Except as otherwise provided in the Specifications, the Contractor shall be responsible for all maintenance until completion and final acceptance of the total project. Various items of maintenance are indicated in applicable sections of the Specifications to which the Contractor is referred. Contractor is expected to maintain all erosion control fences, paving, landscape, sod and grassing.

104.18.01 Preconstruction Conference

The Contractor shall schedule a pre-construction conference with the Owner and City Engineer at least three (3) days before beginning work under the contract. The contractor shall submit a proposed work schedule at the pre-construction conference.

104.19.01 Traffic Control

All project work must conform to GDOT Section 150 Specification, Special Provisions and local City guidelines for uniform traffic control.

104.20.01 Control of Materials

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION SECTION 104-000 SUMMARY OF WORK

Source of Supply and Quality Requirements: The materials used on the work shall conform to the requirements of the contract, plans and specifications. Unless otherwise specified, such materials that are manufactured or processed shall be new (as compared to used or processed).

In order to expedite the inspection and testing of materials, the Contractor shall furnish complete statements to the Engineer as to the origin, composition, and manufacture of all materials to be used in the work. Such statements shall be furnished promptly after execution of the contract but, in all cases, prior to delivery of such materials.

Samples, Tests and Cited Specifications: All materials used in the work may be inspected, tested, and approved by the City Engineer/Project Manager before incorporation in the work. Any work in which untested materials are used without approval or written permission of the City Engineer or Contractor shall be performed at the Contractor's risk. Materials found to be unacceptable and unauthorized will not be paid for and, if directed by the City Engineer or Contractor, shall be removed at the Contractor's expense. Unless otherwise designated, tests in accordance with cited standard methods of AASHTO or ASTM which are current on the date of advertisement for bids will be made by and the expense of the owner. Samples will be taken by a qualified representative of the Owner. All materials being used are subject to inspection, test or rejection at any time prior to or during incorporation into the work. Copies of all tests will be furnished to the Contractors representative at his request.

Certification of Compliance: The City Engineer permit the use, prior to sampling and testing of certain materials, or assemblies when accompanied by manufacturer's certificates of compliance stating that such materials or assemblies fully comply with the requirements of the contract. The certificate shall be signed by the manufacturer. Each lot of such materials or assemblies delivered to the work must be accompanied by a certificate of compliance in which the lot is clearly identified.

Materials or assemblies used on the basis of certificates of compliance may be sampled and tested at any time and if found not to be in conformity with contract requirements will be subject to rejection whether in place or not,

The form and distribution of certificates of compliance shall be as approved by the City Engineer.

When a material or assembly is specified by "brand name or- equal" and the contractor elects to furnish the specified "brand name", the contractor shall be required to furnish the manufacturer's certificate of compliance for each lot of such material or assembly delivered to the work. Such certificate of compliance shall clearly identify each lot delivered and shall certify as to: (a) Conformance to the specified performance, testing, quality of dimensional requirements; and (b) Suitability of the material or assembly for the use intended in the contract work.

Should the contractor propose to furnish an "or equal" material or assembly, he shall furnish the manufacturer's certificates of compliance as hereinbefore described for the specified brand name material or assembly, However, the City Engineer shall be the sole judge as to whether the proposed "or equal" is suitable for use in the work.

The City Engineer reserves the right to refuse permission for use of materials or assemblies based on certificates of compliance.

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION SECTION 104-000 SUMMARY OF WORK

Plant Inspection: The City Engineer or his authorized representative may inspect, at its source, any specified material or assembly to be used in the work. Manufacturing plants may be inspected from time to time for determining compliance with specified manufacturing methods or materials to be used in the work and to obtain samples required for his acceptance of the material or assembly.

Should the City Engineer conduct plant inspections, the following conditions shall exist:

- (a) The City Engineer shall have the cooperation and assistance of the contractor and the producer with whom he has contracted for materials;
- (b) The City Engineer shall have full entry at all reasonable times to such parts of the plant that concern the manufacture or production of the materials being furnished; and
- (c) If required by the City Engineer, the contractor shall arrange for adequate office or working space that may be reasonably needed for conducting plant inspections. Office or working space should be conveniently located with respect to the plant.

It is understood and agreed that the Owner shall have the right to retest any material which has been tested and approved at the source of supply after it has been delivered to the site. The Engineer shall have the right to reject material which, when retested, does not meet the requirements of the contract, plans, or specifications.

Restroom Facility: The Contractor shall furnish a restroom facility during the construction of the project. The restroom shall be maintained and kept clean by the Contractor daily. It shall not be placed in front of or adjacent to any residents. The facility shall be removed from the site at the completion of the project.

Storage of Materials: Materials shall be so stored as to assure the preservation of their quality and fitness for the work. Stored materials, even though approved before storage, may again be inspected prior to their use in their work. Stored materials shall be located to facilitate their prompt inspection. The contractor shall coordinate the storage of all materials with the City Engineer.

Unacceptable Materials: Any material or assembly that does not conform to the requirements of the contract, plans or specifications shall be considered unacceptable and shall be rejected. The contractor shall remove any rejected material or assembly from the site of the work, unless otherwise instructed by the City Engineer. No rejected material or assembly, the defects of which have been corrected by the contractor, shall be returned to the site of the work until the City Engineer has approved its use in the work.

END OF SECTION 104-000

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION Section 132-000 TEMPORARY CONSTRUCTION FACILITIES

132.1 General

132.1.01 Description of Requirements

- A. Provide all construction facilities and temporary controls required for the Work of the project and maintain supervision of same.
- B. Verify with the Owner's Representative and provide as required, the following items without additional cost to the Owner:
 - 1. Temporary lighting required that would be in addition to that existing.
 - 2. Power extension cords for tools and equipment.
 - 3. Temporary field offices and storage sheds.
 - 4. Temporary barriers and fences.
 - 5. Temporary controls for noise, dust, water and erosion.
 - 6. Temporary construction aids.
 - 7. Temporary tree and plant protection.
 - 8. Security, protection and safety signage.
 - 9. Temporary sanitary facilities.
 - 10. Temporary telephone service.
 - 11. All additional construction facilities and temporary controls required by, and in accord with, legal requirements.
- C. Provide all work and facilities in full accord with all authorities having jurisdiction.
 - 1. The location of any temporary facilities and the extent of the facilities and services to be provided shall be subject to the requirements of the Contractor and the approval of, and to such conditions as, the Owner may prescribe.
- D. Regarding required construction facilities and temporary controls, provide for the following:
 - 1. Responsibility for initiating all safety measures including, but not limited to, all barriers, fences and gates, concrete encasement, signs, and all other personnel warning and safety devices of every kind required by Code, local utility company, or Owner.
 - 2. Disconnecting and removal of all construction controls that are not part of permanent construction when and as directed by Owner, or at completion of Work.

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION Section 132-000 TEMPORARY CONSTRUCTION FACILITIES

3. Filing of all permits for construction with local authorities.
4. Payment of all fees as well as all inspection and supervision costs as may be levied by the utilities.
5. Payment of all usage, service and energy charges for temporary utilities for construction purposes.
6. Maintenance of all of this Contractor's temporary work and facilities.
7. Required grubbing, excavation and backfill for this Contractor's construction facilities.
8. All barriers, fences and gates, concrete encasement, signs, and all other personnel warning and safety measures and devices of every kind required by Code, local utility company, or Owner.
9. Disconnecting and removing of all of this Contractor's temporary work not part of permanent construction when and as directed by the Owner's Representative.

132.1.02 Temporary Sanitary Facilities for Construction Personnel

- A. Since no services will be available for temporary toilets, provide, maintain and remove when directed, portable chemical toilets for this Contractor's construction and office personnel.
- B. Provide quantity and location of temporary toilets as required by authorities having jurisdiction, including, but not limited to OSHA, and subject to approval of the Owner's Representative.
- C. Contractor shall maintain temporary toilets in a sanitary condition at all times, subject to approval of the Owner's Representative.

132.1.03 General Items

- A. In general, make materials deliveries during normal working hours. Where special deliveries must be made at other times, request Owner approval. After approval, arrange for proper labor force to receive and unload. If this procedure is not complied with, delivery will not be permitted.
- B. Staging areas for delivery of materials and equipment will be at locations designated by Owner.
- C. Contractor understands that other contractors will be working on the site for the duration of this Contract. Sequence operations to accommodate and coincide with the operations of the other contractors, and as approved by the Owner. Areas will be made available in accord with Owner's requirements.
- D. Utility mains and utility services to buildings or other facilities of the Owner or another contractor shall not be cut off or otherwise interrupted without permission from the Owner or the Owner's Representative.
 1. After authorization, prior to interrupting any utility service, the Contractor shall ascertain that he has the proper materials, together with adequate workmen and equipment, to

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION Section 132-000 TEMPORARY CONSTRUCTION FACILITIES

complete the work in a minimum amount of time.

2. Where possible, interruption in service shall be scheduled during the hours when the facilities are not in use.
3. Cost of delays and inconvenience to the Owner, when normal services are not resumed as scheduled, shall be chargeable to the Contractor.

132.1.04 Contractor Access and Egress

- A. Truck hauling of materials for the Work will be in accordance with the Contract Documents, the GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION.

132.1.05 Temporary Construction Facilities and Service

- A. Contractor shall be responsible for providing any temporary onsite construction facilities that he may deem appropriate. All temporary facilities shall be maintained in an orderly, clean, and presentable fashion. These facilities may NOT be located within the right-of-way of any public road.
- B. All temporary construction compounds and/or material holding areas shall be removed and the area restored to pre-construction conditions prior to substantial completion.

END OF SECTION 132-000

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION SECTION -133-000 CLEANING

133.1 General

133.1.01 Description

- A. Maintain job site, surrounding areas, and public properties free from improperly stored materials, accumulations of waste, debris, and rubbish caused by operations.
- B. At completion of Work, remove waste materials, rubbish, tools, equipment, machinery, surplus materials, and clean all sight-exposed surfaces. Leave job site clean and ready for occupancy.

133.2 Products

133.2.01 Materials

- A. Use only cleaning materials recommended by manufacturer of materials of surface to be cleaned.
- B. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

133.3 Execution

133.3.01 Cleaning - General

- A. Cleaning and disposal:
 - 1. Conduct cleaning and disposal operations in accord with legal requirements.
 - 2. Do not burn or bury rubbish and waste materials on job site. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
- B. Burning:
 - 1. Burning of the trees, shrubs, bushes, etc., cleared on the project site will not be allowed within the project site.
- C. Hazards control:
 - 1. Store volatile wastes in covered metal containers and remove from premises daily.
 - 2. Prevent accumulation of wastes which create hazardous conditions.
 - 3. Provide adequate ventilation during use of volatile or noxious substances.

133.3.02 Clean-up During Construction

- A. Execute cleaning to ensure job site, premises, adjacent and public properties are maintained free from accumulations of waste materials and rubbish.
- B. Wet down dry materials and rubbish to lay dust.

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION SECTION -133-000 CLEANING

- C. At reasonable intervals during progress of Work, clean job site and public properties, and dispose of waste materials, debris and rubbish.
- D. Provide dump containers on job site for collection of waste materials, debris and rubbish.
 - 1. Permit Owner's other contractors to place waste materials, debris and rubbish in containers provided by this Contractor.
- E. Remove waste materials, debris and rubbish from job site, premises, adjacent and public properties and legally dispose of at public or private dumping areas.
- F. Handle materials in a controlled manner with as few handlings as possible. Do not drop or throw materials from height.
- G. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly painted surfaces.

133.3.03 Final Cleaning

- A. In preparation for substantial completion, clean all concrete.
- B. Remove debris, grease, tire tracks, concrete waste, dirt stains, and other foreign materials, from finished concrete pavement and pavement surface areas.
- C. Repair, patch and touch-up marred surfaces (pavement and grass) to specified finish, and to match adjacent surfaces as appropriate.
- D. Broom clean paved surfaces; rake clean other surfaces of grounds.

133.3.04 General Requirements

- A. If the Contractor fails to comply with the requirements of this Article, in the opinion of the Owner or the Owner's Representative, the Owner's Representative shall perform the necessary clean-up and deduct the cost of work from the monies due or to become due to said Contractor.

END OF SECTION 133-000

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION SECTION 03-1100 SITE CLEARING FOR THE TRAIL

PART 1 -GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Survey verification of trail horizontal alignment and vertical elevation staking.
 2. Protecting existing vegetation to remain.
 3. Removing existing vegetation.
 4. Clearing and grubbing.
 5. Stripping and stockpiling topsoil.
 6. Removing above-and below-grade site improvements.
 7. Disconnecting, capping or sealing site utilities if necessary.
 8. Temporary erosion-and sedimentation-control measures.
- B. Trail horizontal alignment and vertical elevation staking- Prior to beginning clearing and grading of the trail, the Contractor shall survey and stake the proposed center line and clearing limits of the proposed trail for approval by the City Engineer and or Project Manager. For City Engineer and Project Manger review and approval, the Contractor shall provide construction staking at fifty feet (50') stations of the trail center line and clearing limits. Based on the approved center line alignment and clearing limits, the Contractor can then commence to the installation of Erosion Control measures and clearing of the trail corridor.

Once the trail corridor has been cleared of debris, the Contractor shall then re-stake the proposed centerline and edge of pavement grades at 50-foot intervals for review and approval by the City Engineer/Project Manager to confirm trail center line elevation and potential adjustments to construct the trail alignment. Once the trail center line vertical elevation staking has been approved been approved by the Engineer/Project Manager, the Contractor can begin grading and installation of the proposed trail.

The Contractor shall make themselves readily available to the City and the Project Engineer, to walk the proposed trail center line and clearing limits to determine if any potential modifications to the trail alignment and profile are necessary.

1.2 MATERIAL OWNERSHIP

- A. Stripped topsoil and other cleared vegetation materials shall become Contractor's responsibility and shall be removed from Project site.

1.3 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining streets, trails walkways, and other adjacent occupied or used facilities during site-clearing operations.

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION SECTION 03-1100 SITE CLEARING FOR THE TRAIL

1. Do not close or obstruct access roads, parking lots or trails or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
 2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.
- B. Salvable Improvements: No salvageable improvements are expected on site.
- C. Utility Locator Service: Notify Georgia utilities protection center at before commencing site clearing.
- D. Do not commence site clearing operations until temporary erosion-and sedimentation-control measures are in place.
- E. The following practices are prohibited outside of the limits of the project:
1. Storage of construction materials, debris, or excavated material.
 2. Parking vehicles or equipment.
 3. Foot traffic.
 4. Erection of sheds or structures.
 5. Impoundment of water.
 6. Excavation or other digging unless otherwise indicated.
 7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

1.4 DEFINITIONS

- A. Subsoil: All soil beneath the topsoil layer of the soil profile and typified by the lack of organic matter and soil organisms.
- B. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.
- C. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil and is the zone where plant roots grow. Its appearance is generally friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches (50 mm) in diameter; and free of subsoil and weeds, roots, toxic materials, or other non-soil materials.
- D. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction, and indicated on Drawings.
- E. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction.

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION SECTION 03-1100 SITE CLEARING FOR THE TRAIL

- F. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

PART 2 -PRODUCTS

2.1 MATERIALS

- A. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site. Follow recommendations of Geotechnical Engineer.

PART 3 -EXECUTION

3.1 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Locate and clearly identify trees, shrubs, and other vegetation to remain or to be relocated. All existing wetlands indicated on plans are to be left undisturbed during demolition and construction phases.
- C. Protect existing site improvements to remain from damage during construction.
1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- A. Construct temporary erosion and sedimentation control systems as shown on Construction Drawings, and as directed by the "Storm Water Pollution Prevention Plan (SWPPP) included in the Construction Drawings, to protect adjacent properties and water resources from erosion and sedimentation.
- B. In the event that site work on this project will disturb one or more acres, starting work shall be strictly governed by the sequence of construction as specified in the SWPPP site maps. Contractor shall not begin construction without "National Pollution Discharge Elimination System" (NPDES) permit governing discharge of storm waters from site for entire construction period. NPDES permit requires SWPPP to be in place during construction.
- C. Clearing and grubbing shall commence in the proper sequence as stated in phase 1 of the Best Management Practice Sequence specified on the SWPPP site maps and subsequent to the halt in construction for performance of the inspection and certification of BMP's as stated.
- D. Contractor shall conduct storm water management practices in accordance with the project SWPPP and applicable NPDES permit and shall enforce action taken or imposed by Federal or State agencies, including cost of fines, construction delays and remedial actions resulting from Contractor's failure to comply with provisions of NPDES permit.

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION SECTION 03-1100 SITE CLEARING FOR THE TRAIL

3.3 TREE AND PLANT PROTECTION

A. General: Protect trees and plants remaining on-site according to requirements to the City of Canton Tree ordinance and Protection requirements.

B. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by Engineer.

3.4 EXISTING UTILITIES

A. Locate, identify, disconnect, and seal or cap utilities indicated to be removed or abandoned in place.

1. Arrange with utility companies to shut off indicated utilities.

B. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Engineer not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Engineer's written permission.

3.5 CLEARING AND GRUBBING

A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.

1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
2. Fully remove all stumps within the concrete trail and grind down all stumps within the shoulder of the trail or clearing limits. Contractor shall remove all roots, obstructions, and debris to a depth of 24 inches below exposed trail subgrade.
3. Use only hand methods for grubbing within protection zones.
4. Chip removed tree branches and use for mulch and soil stabilization on exposed areas outside of concrete path.

B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated. Placement of fill material shall be directed by Geotechnical Engineer.

3.6 TOPSOIL STRIPPING

A. Remove grassed before stripping topsoil.

B. Strip topsoil as Strip topsoil in a manner to prevent intermingling with underlying subsoil or other waste materials.

C. Stockpile topsoil away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water.

3.7 SITE IMPROVEMENTS

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION SECTION 03-1100 SITE CLEARING FOR THE TRAIL

A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property

B. Remove existing above-and below-grade improvements as indicated and necessary to facilitate new construction.

3.8 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off the Owner's property.

B. Separate recyclable materials produced during site clearing from other non-recyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities. Do not interfere with another Project work.

END OF SECTION 03-1100

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION SECTION 03-2001 GRADING, EARTHWORK AND SITE PREPARATION FOR THE TRAIL-

PART 1 - PRODUCTS

1.0 SUMMARY

- A. Section includes but is not limited to:
 - 1. Grading for trail, walks, parking lots, roads and shoulders.
 - 2. Installation of subbase material.
 - 3. Installation of storm pipe.
 - 4. Limited relocation of Georgia Power Access road.

1.1 GENERAL

- A. Contractor shall verify and review all proposed elevations with the City Engineer prior to commencement and completion of final grading activity. The City Engineer shall review and approve all proposed elevations of the trail center line alignment, parking lots, curb, walkways, boardwalk, storm drainage, and other construction elements, in the field prior to final installation activities.
- B. On completion of the clearing and grubbing of the trail corridor, the Contractor shall re-stake the trail center line, parking lots, walkways, curb with the proposed grades at 50' stations and make themselves available for a second review of the proposed elevations.

1.2 MATERIALS

All testing is to meet the requirements outlined in the GDOT Sampling, Testing, and Inspection Guide.

- A. General: Where the terms "approved," "suitable," "unsuitable," and similar designations are used in specifications section pertaining to earthwork, it means earth or material designated as being approved, suitable or unsuitable for their intended use by the soil's technician of the Architect or Engineer.
- B. Suitable Soil Materials are defined as those complying with ASTM D-2487 soil classification groups: GW, GP, GM, SM, SW, and SP.
- C. Unsuitable Soil Materials are defined as those complying with ASTM D-2487 soil classification groups: GC, SC, MH, ML, CL, CH, OL, OH, PT. Clays, silts, and organic soils will be considered as unsuitable materials. Excess water in materials will be a basis for establishing unsuitable material regardless of gradation.
- D. Backfill and Fill Materials shall be suitable soil materials, free of clay, rock or gravel larger than 2" in any dimension, debris, waste, frozen materials, vegetable and other deleterious matter. Suitable materials for earth fill shall generally be composed of sands, clay-sand and silt-sand mixtures and shall be approved by the geotechnical engineer or Engineer prior to being incorporated in fills.

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION SECTION 03-2001

GRADING, EARTHWORK AND SITE PREPARATION FOR THE TRAIL-

- E. Borrow shall consist of sand or sand clay soils capable of being readily shaped and compacted to the required densities, and shall be free of roots, trash and other deleterious material.

PART 2 – EXECUTION

The Contractor shall employ a licensed (Georgia), GDOT pre-certified geotechnical and material testing firm to verify the subbase, base and concrete pavement have been installed in accordance with site densities and GDOT standards.

The Contractor is responsible that all testing is to meet the requirements outlined in the GDOT Sampling, Testing, and Inspection Guide. At a minimum, the Contractor shall provide daily compaction and testing reports for trail base and subbase material at a minimum of 50' intervals prior to concrete pouring. Refer to Cast in Place Specifications for required geotechnical frequency and requirements associated with concrete testing and sampling.

2.0 PREPARATION

A. CLEARING AND GRUBBING

1. Completely remove and dispose of all trees, brush, stumps, roots, grass, weeds, rubbish, and all other obstructions resting on or protruding through the surface of the existing ground and the surfaces of excavating areas.
2. Clear and grub within all areas designated for site grading except where selective clearing will be performed in some areas by retaining selected trees as designated on the Construction Documents or directed by the Engineer. Protect from damage by construction equipment, and in a manner approved by the Engineer, all trees selected by the Owner for saving.
3. Within building sites and paved area, remove to a depth of not less than 2 feet below the surface of all stumps, roots, etc., protruding through or appearing on the surfaces of the existing ground and completed excavations, and replace with compacted backfill before the area is filled.
4. Within all other areas designated for clearing and grubbing, remove to a depth of 18"-24" foot below the completed surface all stumps, roots, and other debris projecting through or appearing on the surface of the ground.
5. Strip topsoil material from all areas to be excavated or filled upon. Stockpile for later use stripped material suitable for topsoil and dispose of all other material as directed by the Engineer.

B. DUST CONTROL: NA

- C. Debris Disposal: Prior to exaction and/or filling, remove from the project site and dispose of all clearing and grubbing debris and other accumulated trash. The Contractor is **not** permitted to burn or bury any proposed debris on site.

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION SECTION 03-2001 GRADING, EARTHWORK AND SITE PREPARATION FOR THE TRAIL-

D. General Performance:

1. The Contractor shall remove excess material from the site and dispose of in a legal manner.
2. In the event materials containing toxic substances, oil products or other pollutants are encountered during excavation, immediately cease operations and notify the Engineer. Proceed with the excavation only when so directed by the Engineer, using additional procedures and precautions, if any, as necessary to contain and dispose of the contaminated material in compliance with all applicable laws and regulations.

E. Fills:

1. The Contractor shall employ a licensed (Georgia), GDOT pre-certified geotechnical and material testing firm to verify the subbase, base and concrete pavement have been installed in accordance with site densities and GDOT standards.
2. All fills, and subbase construction of the trail alignment shall be reviewed and directed by a Geotechnical Engineer. The Geotechnical Engineer shall provide oversight of construction of fills and suitable material placed in layers of not more than 8 inches in depth, measured loose and rolled and/or vibrated with suitable equipment until compacted. Thickness of layers may be increased only as directed by the Geotechnical Engineer and provided the equipment and methods used are proven by field density testing to be capable of compacting thicker layers to specified densities. Decrease layer thickness if equipment and methods used prove to be incapable of compacting layers to specified densities.
3. Place no material that will not pass through a 6-inch diameter ring within the top 12-inches of the surface of the completed fill, and none that will not pass through a 3-inch diameter ring within the top 4-inches of the completed fill. Do not use broken concrete or asphaltic pavement in fills.
4. Compact fill within the roadways, trails, walkways, parking areas, and building sites to a density of not less than 98 percent of its maximum density by AASHTO 180 (ASTM D 1557).
5. Muck, marl or other unsuitable material may be used in open areas if so designated on the Drawings or directed by the Engineer. Place muck material used as fill in layers of not more than 12-inches in depth measured loose. When dry, or as directed by the Engineer, disc and harrow this layer to break up large pieces of the material. Compaction of unsuitable material will not be required.
6. Place and compact fills to within 0.1-foot of the required elevations and slope surfaces to drain as shown on the Drawings.

F. Subgrades:

1. Construct subgrades for paved areas to conform to the grades, lines and cross sections shown on the Drawings, of uniform density, ready to receive the base course.
2. Stabilize in accordance with the construction drawings and GDOT specifications.
3. After the subgrade has been properly shaped, stabilized (and approved by Geotechnical Engineer), bring the surface to a firm, unyielding surface by rolling the entire area with an approved vibratory

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION SECTION 03-2001

GRADING, EARTHWORK AND SITE PREPARATION FOR THE TRAIL-

roller. As determined by the Geotechnical Engineer, if the subgrade material at the time of the rolling contains insufficient moisture to insure proper compaction, add water as directed before compacting or allow subgrade material containing excess moisture, to dry to the proper consistency before being compacted.

4. Compact the subgrade, including cut and fill sections, to a density of not less than 98 percent of the maximum density as determined by the AASHTO T 180 (ASTM D 1557).
5. After the subgrade has been prepared, maintain it free of ruts, depressions and damage resulting from the hauling and handling of any material, equipment, tools, etc. Provide and maintain ditches or drains along the completed subgrade section to prevent damage by storm water. Just before the base course is laid, check the subgrade for crown and elevation. Complete the subgrade to provide a final elevation within 0.1-foot of the required elevation.

2.1 TOP SOIL

- A. Contractor shall strip, stockpile and remove unused topsoil from the site.
- B. Topsoil shall be placed to a depth of 4" over all disturbed and shoulder areas.
- C. Any remaining topsoil will be hauled off site and disposed of at the Contractor's expense.
- D. Additional topsoil shall meet Georgia Department of Transportation Specification 893.1. Any additional topsoil that is required to repair disturbed areas and complete the contract shall be provided by the Contractor at his expense.

2.2 EXCAVATION

- A. Excavation is unclassified and includes excavation to subgrade elevations indicated, regardless of character of materials and obstructions encountered.
- B. All excavation shall be in conformity with the lines, grades and cross sections shown on the Plans or established by the Architect or Engineer. All suitable material removed in the excavation shall be used as far as practicable in formation of embankment, subgrades and shoulders and at such other places as may be indicated on the Plans or directed by the Architect or Engineer.
- C. Unauthorized Excavation consists of removal or loosening of materials beyond indicated subgrade elevations or dimensions without specific directions of the Architect or Engineer. Unauthorized excavation, as well as remedial work directed by Architect or Engineer, and as specified herein shall be at Contractor's expense.
- D. Additional Excavation: When excavation has reached required subgrade elevations and unsuitable materials, exist, carry excavations deeper and replace excavated materials as directed by Architect or Engineer. Dispose of unsuitable material as directed by the Architect or Engineer. The Contractor shall dispose of unsuitable and surplus materials except where the Architect or Engineer permits the use of such fill slopes, or unless specific disposal areas are shown on the Plans.

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION SECTION 03-2001

GRADING, EARTHWORK AND SITE PREPARATION FOR THE TRAIL-

- E. Dewatering: Prevent surface water and subsurface or ground water flowing into excavations and from flooding project site and surrounding area. Do not allow water to accumulate in excavations. Remove water to prevent softening of trail subgrades and, undercutting footings, and soil changes detrimental to stability of subgrades and foundations. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavations.
- F. Proper drainage shall be maintained at all times.
- G. Perform excavation within drip-line of large trees to remain by hand or by other means which will result in (1) cleanly twisting, tearing, breakage or other injury to roots remaining on the tree. Protect existing trees and shrubs at all times during earthwork operations. No trees shall be removed without prior approval of the Owner.

2.3 BORROW

- A. Shall be excavated and hauled by the Contractor from his own sources and shall meet the requirements as specified.
- B. Borrow shall be procured by the Contractor if necessary, to construct the trail.
- C. Contractor shall bear all expenses in developing borrow sources including drying material, haul roads, excavation and hauling.

2.4 GROUND SURFACE PREPARATION FOR FILL

- A. All vegetation such as roots, brush, heavy sods, and heavy growth of grass, decayed vegetation matter, rubbish, and other unsuitable material within the areas to be filled shall be stripped and removed prior to beginning the fill operation.
- B. Sloped ground surfaces steeper than 1 vertical to 4 horizontals, on which fill is to be placed shall be plowed, stepped, benched or broken up as directed, in such a manner that the fill material will bond with the existing surface.
- C. Surfaces on which fill is to be placed and compacted shall be wetted or dried as may be required to obtain the specified compaction.

2.5 FILL

- A. Shall be reasonably free from roots, organic material, trash and stones having maximum dimensions of 6 inches.
- B. Shall be placed in successive horizontal layers of 8 inches (4 inches for hand tamped compaction) in loose depth for the full width of the cross-section and compacted as required with heavy compaction equipment.

2.6 FINISH GRADING

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION SECTION 03-2001

GRADING, EARTHWORK AND SITE PREPARATION FOR THE TRAIL-

- A. All areas covered by the project including excavated and filled sections and adjacent transition areas shall be smooth graded and free from irregular surface changes and any debris.
- B. Degree of finish shall hand raking and finishing, except as otherwise specified.
- C. The finished surface of unpaved areas shall be not more than 0.05' feet above or below the established grade or designed cross-section. Grading shall be done in order that no ponding will occur.
- D. Ditches shall be finished smooth to reduce erosion and permit adequate drainage.

2.7 DISPOSAL OF WASTE MATERIAL

- A. All vegetation, roots, brush, sod, broken pavements, curb and gutter, rubbish, and other unsuitable or surplus material stripped or removed from the limits of construction shall be disposed of by the Contractor off site.

2.8 PROTECTION

- A. Protect existing trees and shrubs at all times during earthwork operations. No trees shall be removed without prior acceptance of the Owner.
- B. The Contractor shall be responsible for protection of below grade utilities shown on the drawings or indicated to him by the Owner at all times during earthwork operations.
- C. Graded areas shall be protected from traffic, erosion, settlement, or any washing away that may occur from any cause prior to acceptance.
- D. All repair or reestablishment of grades prior to final acceptance shall be at the Contractor's expense.

PART 3 - TESTING

3.1 COMPACTION TESTING

- A. General: Compaction of earth fill and all pavement subgrades shall be performed to the percentage of maximum standard of modified dry densities and to the depths as indicated below:
 - 1. Roadway/Trail Subgrades: 98% Modified (ASTM Test D-1557) Compact top 12" in Parking areas and top 15" in Trails and Driveways.
 - 2. Subgrades for utility installations: 97% Standard (ASTM Test D-698) to 24" depth.
 - 3. Unpaved Areas to be grassed, sodded or landscaped: upper 2 feet to 90% Standard (ASTM Test D-698) full depth.

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION SECTION 03-2001

GRADING, EARTHWORK AND SITE PREPARATION FOR THE TRAIL-

4. All other areas not described above: as directed by Geotechnical Engineer, or Project Engineer.
- B. Moisture Control: All compaction shall be performed at material moisture contents within 3 percentage points, plus or minus, of optimum. Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade, or layer of soil material, during or subsequent to compaction operations. Remove, and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by dicing, harrowing or pulverizing until moisture content to a satisfactory value.
- C. Field Density Tests: **All testing is to meet the requirements outlined in the GDOT Sampling, Testing, and Inspection Guide.** Tests shall be made in accordance with ASTM Method D-1556 and/or ASTM 2922. Minimum testing frequency shall be based on the most stringent of the following requirements as applicable. Additional tests may be required by the Architect or Engineer in areas he deems critical.
- One every layer of fill,
 - One every 200 cubic yards of fill,
 - One every 250 square yards of roadway subgrade of fill,
 - Areas where degree of compaction is in question
- If in opinion of Architect or Engineer, based on testing service reports and Inspection, subgrade or fills which have been placed are below specified density, additional compaction and testing will be required.
- D. Proof Rolling: Proof rolling of the subbase or subgrade of all areas of new road paving will be required. Equipment shall have a minimum axle load of 6,000 pounds and a maximum axle load of 15,000 pounds or as determined by the Geotechnical Engineer or Project Engineer.

END OF SECTION

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISIONS CAST-IN-PLACE CONCRETE SECTION 033-000

PART 1 -GENERAL

1.01 SECTION INCLUDES

- A. Section includes cast-in-place concrete work indicated in the Contract Documents or otherwise required for proper completion of the work.

1.02 RELATED SECTIONS

- A. Section 131 000 -Submittal Procedures
- B. Section 03 3301-Concrete Formwork
- C. Section 03 2000 -Concrete Reinforcement
- D. Section 03-3300- Concrete Mix Submittal Form

1.03 REFERENCES

- A. ACI214 -Recommended Practice for Evaluation of Strength Test Results of Concrete.
- B. ACI 304 -Guide for Measuring, Mixing, Transporting and Placing Concrete.
- C. ACI 305 -Hot Weather Concreting.
- D. ACI 306 -Cold Weather Concreting.
- E. ACI 308 -Standard Practice for Curing Concrete.
- F. ACI 309 -Guide for Consolidation of Concrete.
- G. ASTM C31 -Standard Practice for Making and Curing Concrete Test Specimens in the Field.
- H. Cast-in-Place Concrete
- I. ASTM C33 -Standard Specification for Concrete Aggregates.
- J. ASTM C39 -Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
- K. ASTM C94 -Standard Specification for Ready-Mixed Concrete.
- L. ASTM C138 -Standard Test Method for Unit Weight, Yield, and Air Content (Gravimetric) of Concrete.
- M. ASTM C143 -Standard Test Method for Slump of Hydraulic Cement Concrete.
- N. ASTM C150 -Standard Specification for Portland Cement.
- O. ASTM CI72 -Standard Practice for Sampling Freshly Mixed Concrete.
- P. ASTM C173 -Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
- Q. ASTM C230 -Standard Specification for Flow Table or Use in Tests of Hydraulic Cement.
- R. ASTM C260 -Standard Specification for Air-Entraining Admixtures for Concrete.
- S. ASTM C309 -Standard Specification for Liquid Membrane Forming Compounds for

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISIONS CAST-IN-PLACE CONCRETE SECTION 033-000

Curing Concrete.

- T. ASTM C494 -Standard Specification for Chemical Admixtures for Concrete.
- U. ASTM C618 -Standard Specification for Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete.
- V. ASTM E1155 -Standard Test Method for Determining Floor Flatness and Levelness Using the F-Number System.

1.04 NOTICE

A. Contractor shall notify the City Engineer and the Geotechnical Engineer/Structural Testing/Inspection Agency (not less than 48 hours) prior to placing concrete to test for compaction.

1.05 QUALITY ASSURANCE

A. Structural Testing Inspection Agency shall perform the following quality related items:

1. Examine concrete in truck to verify that concrete appears properly mixed.
2. Perform a slump test as deemed necessary for each concrete load. Record if water or admixtures are added to the concrete at the job site. Perform additional slump tests after job site adjustments.
3. Mold four specimens per set for compressive strength testing; one set for each 50 cubic yards of each mix design or once a week whichever comes first. For each set molded, record:
 - a. Slump
 - b. Air content
 - c. Unit weight
 - d. Temperature, ambient and concrete
 - e. Location of placement
 - f. Any pertinent information, such as addition of water, addition of admixtures, etc.
4. Perform one 7-day and two 28-day compressive strength tests. (Use one as a spare to be broken as directed by the Design Professional if compressive strengths do not appear adequate.)

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISIONS CAST-IN-PLACE CONCRETE SECTION 033-000

5. Report in writing, as directed by the Design Professional, on the same day that tests are performed. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing agency, concrete design compressive strength, location of concrete placement in structure, concrete mix proportions and materials, compressive breaking strength and type of break.

6. Test concrete slabs for specified flatness and levelness in accordance with ASTM E1155. As a minimum, test three placements: the first placement and two additional placements as directed by the Design Professional. If the tested placement does not meet the specified overall values, test the next placement.

B. The ready-mixed concrete plant shall be certified for conformance with the requirements of the National Ready-Mix Concrete Association.

C. The Structural Testing I Inspection Agency shall provide special inspections as required by Chapter 17 of the building code as required in Specification 01 4525.

D. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.

E. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities." And must be prequalified by GDOT.

F. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

G. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures. Contractor to provide concrete testing for every 50 cy of concrete and or a minimum of once per week.

H. Mockups: Cast concrete **slab-on-grade** panels to demonstrate typical joints, surface finish, texture, tolerances, floor treatments, and standard of workmanship. Build panel approximately **100 sq. ft. for slab-on-grade** as directed by Engineer. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion. Pre-installation Conference: Conduct conference at **Project site**.

City of Canton

Etowah River Park Trail Extension

SPECIAL PROVISIONS CAST-IN-PLACE CONCRETE SECTION 033-000

1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:

- a. Contractor's superintendent.
- b. Independent testing agency responsible for concrete design mixtures.
- c. Ready-mix concrete manufacturer.
- d. Concrete subcontractor.
- e. Concrete mix submittal form.

1.06 CONCRETE MIX DESIGN

A. Establish concrete mix design proportions in accordance with AC1318, Chapter 5.

B. Submit concrete mix designs. Include the following:

1. Type and quantities of materials.
2. Slump.
3. Air content.
4. Fresh unit weight.
5. Aggregates sieve analysis.
6. Design compressive strength.
7. Location of placement in structure.
8. Method of placement.
9. Method of curing.
10. Seven-day and 28-day compressive strengths.

C. Concrete supplier shall submit certifications that the materials used meet applicable ASTM Specifications. Mix designs not conforming to the above will be rejected.

1.07 SLUMP

A. Design concrete with a maximum slump of four inches.

B. If a slump greater than four inches is desired it shall be achieved with a high-range waiver reducer. Design the concrete mix with a high range water reducer slump of two and one-half inches plus or minus one and one-half inches. The maximum slump after high-range water reducers are added shall not exceed six inches.

1.08 FRESH UNIT WEIGHT

A. Normal weight concrete shall have a fresh unit weight of 140 to 152 pcf.

1.09 AIR CONTENT

A. For normal weight concrete, entrained air content shall be five percent plus or minus one and

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISIONS CAST-IN-PLACE CONCRETE SECTION 033-000

one-half percent, unless specified otherwise.

1.10 WATER/CEMENT RATIO

- A. Concrete elements shall have the following maximum water cement ratio:
1. Below Grade Foundations 0.53
 2. Concrete Exposed to Weather 0.45

1.11 SUBMITTALS

- A. Submit a concrete mix design as specified above for each type of concrete included in the work.
- B. Submit a certification from each manufacturer or supplier stating that materials meet the requirements of the ASTM and ACI standards referenced.
- C. Submit manufacturer's data including Product Data and installation instructions for the following items. Manufacturer's Data shall include the name of the manufacturer and date of the publication. All manufacturers' data shall be maintained at the project site by the contractor.

Cast-in-Place Concrete

1. Admixtures
2. Curing materials
3. Expansion joint filler
4. Patching compounds
5. Bonding agents

PART 2 -PRODUCTS

2.01 MATERIALS

- A. Materials designated by specific manufacturer's trade names are approved, subject to compliance with the quality and performance indicated by the manufacturer. Instructions and specifications published by the manufacturer of such materials are included in and are a part of these specifications. Upon request, provide certification from manufacturer or supplier that materials designated by reference to ASTM and ACI standards meet the requirements of these standards.

2.02 CONCRETE STRENGTH

- A. Provide concrete strengths indicated on the Structural Drawings.

2.03 CEMENT

- A. Portland cement shall conform to ASTM C150, Type I, unless noted otherwise. Use one brand only.

2.04 AGGREGATE

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISIONS CAST-IN-PLACE CONCRETE SECTION 033-000

- A. Fine aggregate shall conform to ASTM C33.
- B. Coarse aggregate of gravel or crushed stone shall conform to ASTM C33, Class 3M. Size coarse aggregate in accordance with ACI 318.

2.05 WATER

- A. Water shall be potable and free of deleterious substances in accordance with AC1318.

2.06 AIR ENTRAINING AGENT

- A. Air entraining agent shall conform to ASTM C260.

2.07 WATER REDUCER

- A. Water reducing agent shall conform to ASTM C494.

2.08 HIGH-RANGE WATER REDUCER

- A. High-range water reducers (superplasticizers) shall conform to ASTM C494.
Cast-in-Place Concrete

2.09 CHLORIDE

- A. Use no chlorides of any form in concrete.

2.10 CURING AND SEALING COMPOUND

- A. Acceptable products:
 1. Anti-Hydro International, Inc., A-H Clear Cure.
 2. BASF Building Systems, Kure-N-Seal 25 LV.
 3. Euclid Chemical Co., Rez-Seal.
 4. Lambert Corp., Crystal Clear Seal 1315.
 5. L & M Construction Chemicals, Inc., Dress & Seal.
 6. W. R. Meadows Co., CS-309.
- B. Type: Clear, acrylic-based cure/seal compound, non-yellowing, meeting ASTM C309-07, Type I, Class B.

2.11 FLY ASH

- A. Fly ash shall be Class F fly ash with a loss on ignition of less than five percent or Class C fly ash with a loss on ignition of less than one percent in accordance with ASTM C618.

2.12 ACCELERATORS

- A. Non-chloride accelerators shall conform to ASTM C494.

2.13 RETARDERS

- A. Retarders shall conform to ASTM C494.

City of Canton

Etowah River Park Trail Extension

SPECIAL PROVISIONS CAST-IN-PLACE CONCRETE SECTION 033-000

PART 3- EXECUTION

3.01 HIGH-RANGE WATER REDUCERS

A. High-range water reducers are to be added at dosage recommended by the manufacturer. The slump of the concrete shall be one to four inches at the time the high-range water reducers are added. Do not permit fresh concrete containing superplasticizers to come in contact with fresh concrete not containing superplasticizers.

3.02 ADDITION OF WATER AT JOB SITE

A. Provide batch tickets indicating the amount of mix water withheld at the batch plant for each load of concrete delivered. Water may be added to the batch only if neither the maximum permissible water/cement ratio nor the maximum slump is exceeded.
B. Water shall not be added to the batch after the required on-site testing has been performed.

3.03 PLACEMENT OF CONCRETE

A. Deposit concrete as near as practical to final position to prevent segregation of concrete.
B. Do no flowing of concrete with vibrators.
C. Place floors and slabs in accordance with ACI 302.
D. Do not use aluminum equipment in placing and finishing concrete.
E. Place thickened slabs for partitions integral with floor slabs.
F. Prepare place of deposit, mix, convey, place, and cure concrete in accordance with ACI 301, ACI 304, and ACI 318. Wet forms before placing concrete.

3.04 TIME LIMIT

A. Deposit concrete within one and one-half hours after batching.

3.05 VIBRATION

A Consolidate concrete in accordance with ACI 301 and ACI 309.

3.06 CURING

A. Begin curing procedures immediately following the commencement of the finishing operation.
B. Cure concrete in accordance with ACI 308. Keep the concrete surface moist. If an acrylic curing compound is used, apply in accordance with manufacturer's recommendations to surfaces of concrete not protected for five days by formwork. Do not use curing compounds in areas to receive material that does not adhere to concrete cured with a curing compound unless the curing compound is water soluble.

3.07 ENVIRONMENTAL PROVISIONS

A. Perform cold weather concreting in accordance with ACI 306.

City of Canton

Etowah River Park Trail Extension

SPECIAL PROVISIONS CAST-IN-PLACE CONCRETE SECTION 033-000

- B. Perform hot weather concreting in accordance with ACI 305.
- C. Protect concrete from drying and excessive temperature for the first seven days.
- D. Protect fresh concrete from wind.

3.08 CONTRACTION JOINTS

- A. Obtain Design Professional's approval for location of contraction joints.
- B. Place contraction joints in slabs-on-grade as indicated on the Drawings

3.09 CUTTING CONCRETE

- A. Obtain Design Professional's written approval prior to cutting concrete for installation of other work.

3.10 PATCHWORK AND REPAIRS

- A. Notify Design Professional of any defective areas in concrete to be patched or repaired. Repair and patch defective areas with non-shrink grout. Cut out defective areas over two inches in diameter to solid concrete, but not less than a depth of one inch. Make edges of cuts perpendicular to the concrete surface.

3.11 CONCRETE FINISHES

- A. Finish concrete in accordance with ACI 301 and plans and details.
- B. Finish concrete slabs to flatness and levelness tolerances which correspond to F25/FL 20 minimum overall for composite of all measured values and F, 17/FL 12 minimum for any individual floor section.
- C. For shored construction, FL values do not apply if slab is tested after shoring is removed.
- D. Slabs, which do not meet the flatness and levelness criteria shall be repaired or replaced.

END OF SECTION 033-000

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION SECTION 03- 3300 Concrete Mix Design Submittal Form

CONCRETE MIX DESIGN SUBMITTAL FORM

Project: _____

City: _____

General Contractor: _____

Concrete Contractor: _____

Concrete Strength (Class): _____

Use (describe): _____

Design Mix Information

Please Check One

Based on Standard Deviation Analysis
Trial Mix Test Data

Design Characteristics:

Density		pcf
Strength		psi (28 day)
Air		% specified

*If trial mixes are used the Mix Design is proportioned to achieve $f'_{cr} = f'_c + 1200$ psi
(1400 psi for strength higher than 5000 psi at 28 days)*

<u>MATERIALS</u>	Type/ Source	Specific Gravity	Weight/lb.	Absolute Vol. cu. ft.
Cement				
Flyash				
Microsilica				
Coarse Aggregate				

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION SECTION 03- 3300 Concrete Mix Design Submittal Form

Fine Aggregate				
Water				
Other				
TOTAL				

* **Water/Cement Ratio (lbs. water/lbs. cement) = _____ %**

<u>ADMIXTURES</u>	Manufacturer	Dosage oz/cwt
Water Reducer		
Air Entraining Agent		
Mid Range Water Reducer		
Fibrous Reinforcement		
Other		

Slump before HRWR _____ inches

Slump after HRWR _____ inches

Standard Deviation Analysis (from experience records):

# of Test Cylinders Evaluated:	
Standard Deviation:	

$$f_{cr} = f_c + 1.34s \text{ or } f_{cr} = f_c + 2.33s - 500$$

(Refer to ACI 301 for increased deviation factor when less than 30 tests are available)

LABORATORY TEST DATA

Compressive Strength

**City of Canton
Etowah River Park Trail Extension**

**SPECIAL PROVISION
SECTION 03- 3300
Concrete Mix Design Submittal Form**

Age (days)	Mix #1	Mix #2	Mix #3
7	psi	psi	psi
7	psi	psi	psi
28	psi	psi	psi
28	psi	psi	psi
28 average	psi	psi	psi

REQUIRED ATTACHMENTS:

- Coarse Aggregate Gradation Report*
- Fine Aggregate Gradation Report*
- Concrete Compressive Strength Data or Trial Mixture Test Data*
- Admixture Compatibility certification letter*

Please Check

**City of Canton
Etowah River Park Trail Extension**

**SPECIAL PROVISION
SECTION 03- 3300
Concrete Mix Design Submittal Form**

Submitted by:

Name: _____

Address: _____

Phone #: _____

Main Plant Location: _____

Miles from Project: _____

Secondary Plant Location: _____

Miles from Project: _____

Date: _____

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION SECTION 03-3301 CONCRETE FORMWORK

PART 1 -GENERAL

1.01 SECTION INCLUDES

- A. Section includes the design and erection of formwork, shoring and reshoring for cast-in-place concrete and accessories.

1.02 RELATED SECTIONS

- A. Section 131-000 -Submittal Procedures
- B. Section 133-000 Cleaning
- C. Section 03-3301 -Concrete Reinforcement
- D. Section 03-3000 -Cast-in-Place Concrete

1.03 REFERENCES

- A. ACI 117 -Standard Specifications for Tolerances for Concrete Construction and Materials.
- B. ACI 301 -Standard Specifications for Structural Concrete.
- C. ACI 318 -Building Code Requirements for Structural Concrete.
- D. ACI 347 -Recommended Practice for Concrete Formwork.
- E. ASTM D1751 -Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non extruding and Resilient Bituminous Types).
- F. ASTM E154 -Standard Test Methods for Water Vapor Retarders Used in Contact with Earth under Concrete Slabs, on Walls, or as Ground Cover.

1.04 SUBMITIALS

- A. Submit locations of construction joints for approval.
- B. Submit manufacturer's data for water stops, formwork accessories, inserts, form release agent, and isolation joint filler.
- C. Submit formwork shop drawings signed and sealed by an engineer licensed in the project state. Shop Drawings should include stripping and reshoring procedure with indication of time period required between placement of concrete and removal of formwork.

1.05 CONCRETE FORMWORK

1.05.01 DESIGN OF FORMWORK

- A. Design of formwork, shoring, and reshoring and its removal is the Contractor's responsibility.
- B. Design of formwork, shoring, and reshoring shall conform to ACI 117, ACI 301, ACI 318, and ACI
- C. Design formwork in a manner such that existing or new construction is not overloaded.
- D. Formwork shall be designed by an engineer licensed in the project state.
- E. Do not remove shores or re-shores earlier than recommended by ACI 301 and ACI 347.

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION SECTION 03-3301 CONCRETE FORMWORK

PART 2 -PRODUCTS

2.01 FORM MATERIALS

- A. Construct forms with wood, plywood, metal, fiberglass or a combination of these.
- B. Form materials shall have sufficient strength to prevent distortion.

2.02 FORMWORK ACCESSORIES

- A. Formwork accessories that are embedded in concrete, including ties and hangers, shall be commercially manufactured products. Do not use non fabricated wire form ties.

2.03 FORM RELEASE AGENT

- A. Form release agent shall not bond with, stain, nor adversely affect concrete surfaces.

2.05 ISOLATION JOINT FILLER

- A. Asphalt impregnated premolded fiberboard isolation joint filler shall conform with ASTM D1751 and be 1/2-inch thick by full thickness of slab or joint, unless indicated otherwise on the Drawings.

- A. Provide key type steel forms by Vulcan screed joints, Burke Keyed Kold joint form or Form-A-Key.

PART 3 -EXECUTION

3.01 GENERAL

- A. Erect formwork in accordance with ACI 301, ACI 318, and ACI 347.
- B. Maintain formwork and shoring to support loads until such loads can be supported by concrete structure.

3.02 TOLERANCES

- A. Finished work shall comply with ACI 117 tolerances.

3.03 SURFACE PREPARATION

- A. For concrete exposed to view, seal form joints to prevent leakage.
- B. Before reinforcement is placed, coat contact surfaces of form with form release agent in accordance with manufacturer's recommendations. Do not allow excess form release agent to accumulate in forms or come in contact with concrete surfaces against which fresh concrete will be placed.

3.04 CHAMFERS

- A. Provide 3/4-inch chamfer at all corners.

3.05 FOUNDATION ELEMENTS

- A. Form foundation elements if sailor other conditions are such that earth trench forms are unsuitable.
- B. Sides of exterior grade beams, foundation walls, and turned-down slabs shall be formed.

City of Canton

Etowah River Park Trail Extension

SPECIAL PROVISION

SECTION 03-3301

CONCRETE FORMWORK

- C. Maintain minimum coverage of reinforcing steel as indicated on Structural Drawings.

3.06 INSERTS

- A. Install and secure in position required inserts, hangers, sleeves, anchors, and nailers.
- B. Locate anchor bolts by using templates with two nuts to secure in position.

3.07 EMBEDS

- A. Set and secure embedded plates, bearing plates, and anchor bolts in accordance with approved setting drawings and in such a manner to prevent displacement during placement of concrete.

3.08 FORM REMOVAL

- A. Remove forms carefully in such manner and at such time as to ensure complete safety of structure. Do not remove forms shoring, or reshoring until members have acquired sufficient strength to support their weight and the load thereon safely.

3.09 PROVISIONS FOR OTHER TRADES

- A. Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings and recesses from trades providing such items.
- B. Accurately place and securely support items built into forms. Obtain approval for openings not shown on Drawings.

3.10 CLEANING

- A. Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt or other debris just before concrete is placed.

3.12 CONSTRUCTION JOINTS

- A. Install per plan and construction details.

END OF SECTION 03-3001

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION SECTION 03- 3301 CONCRETE REINFORCEMENT

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. GDOT specifications, the provisions of General Conditions, Supplementary Conditions, and the Sections included under, are included as a part of this Section as though bound herein.

1.02 SUMMARY

- A. The Work includes fabrication and placement of reinforcement for cast-in-place concrete including bars, welded wire fabric, ties, and supports.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply for product selection:
 - 1. Manufacturers: Subject to compliance with requirements, provide product by the manufacturers specified.
- B. Products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product. The "Substitution Request Form" and complete technical data for evaluation must accompany requests for A/E's approval. All materials for evaluation must be received by the Project Manager and Specification Department at least 10 days prior to bid due date. Additional approved manufacturers will be issued by Addendum.

2.02 MATERIALS

- A. Reinforcing Bars (Rebar): ASTM A615, and as follows:
 - 1. Provide Grade 60, deformed for bars No. 3 to 11, except as otherwise indicated.
- B. Steel Wire: ASTM A82, cold drawn steel.
- C. Welded Wire (Reinforcement) Mesh (WWM): ASTM A185, fabricated from as-drawn steel wire into flat sheets.
 - 1. Provide sheet stock only for interior slab on grade and elevated slabs (roll stock not acceptable).
 - 2. Fiber reinforcement shall not be substituted for WWF.

City of Canton

Etowah River Park Trail Extension

SPECIAL PROVISION SECTION 03- 3301 CONCRETE REINFORCEMENT

- D. Fibrous Reinforcement: Furnish fibrillated polypropylene fibers, complying with ASTM C 1116, Type III, for [reinforcement of concrete toppings and] in addition to welded wire fabric in slabs on grade, unless otherwise noted. Provide one of the following:
1. Polypropylene Fibers: 100 percent collated fibrillated polypropylene fibers with an average length of 3/4 inch, a minimum specific gravity of 0.9, and a minimum tensile strength of 80 ksi. Polypropylene fibers shall be added to the concrete mix at a rate of 1-1/2 pounds per cubic yard.
 - a. Products; subject to compliance with requirements, provide one of the following:
 - 1) Fibermesh SI Concrete Systems, Chattanooga, Tennessee.
 - 2) Forta; Forta Corporation, Grove City, Pennsylvania.
 - 3) Grace Fibers; W.R. Grace & Co.-Conn., Cambridge, Massachusetts.
 - 4) Fibrasol F; Axim Concrete Technologies, Inc., Middlebranch, Ohio.
 - 5) Fiberstrand F; Euclid Chemical, Cleveland, Ohio
 2. Fiber reinforcement is to be used in addition to welded wire fabric for concrete trail on grade.
- E. Supports for Reinforcement (including welded wire fabric): Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcement in place.
1. Use wire bar type supports complying with CRSI recommendations, unless otherwise indicated. Do not use wood, brick, and other unacceptable materials.
 2. Over waterproof membranes use precast concrete chairs to prevent penetration of the membrane.
 3. For footings, trench footings, slabs on grade, and grade beams use precast concrete bricks (f'c = 3000 psi min. at 28 days). (Concrete masonry bricks not acceptable.)
 4. For concrete masonry bond beams use #3 bar laterally, tied to each longitudinal reinforcing bar below to hold bars apart and up from bottom. Space #3 bars at 48 inches o.c.

END OF SECTION 03-3301

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION Section 009 –0000 Miscellaneous Construction On-Site Decorative Signage

PART 1 - GENERAL

1.01 SUMMARY

- A. Furnish and install Decorative Sign Assembly as shown on the plans and details.
- B. The term “Decorative Sign Assembly” means the complete assemblage of pole, foundation, sign, frame, finial, decorative pole base, sign anchoring, parts, equipment and miscellaneous components, erected as shown on the plans and in accordance with these specifications forming a complete and independent Sign unit.
- C. Components shall be from a single manufacturer.
- D. Related Work:
 - 1. Section 03 30 00 - Cast-in-Place Concrete
 - 2. Metal Fabrications

1.02 GENERAL REQUIREMENTS

- A. All decorative sign materials furnished by the contractor shall be new and shall conform to the applicable requirements of MUTCD.
- B. Shop Drawings: Provide 3 sets of drawings representing each sign type. It sign shall include the decorative pole, decorative pole base, foundation, anchoring detail, sign, frame, finial, sign anchoring attachments, parts and hardware.

1.03 REFERENCES

- A. Standards of the following as referenced:
 - 1. Aluminum Association (AA).
 - 2. American National Standards Institute (ANSI).
 - 3. American Society for Testing and Materials (ASTM).
 - 4. Manual Uniform Traffic Control Device (MUTCD)

1.04 SYSTEM DESCRIPTION

- A. Design criteria: Design to resist wind loads 125 MPH when installed in accord with reviewed shop drawings and installation instructions.

1.05 SUBMITTALS

- A. Product Data:
 - 1. Manufacturer's provide statement regarding compliance with QUALITY ASSURANCE.
 - 2. Manufacturer's product literature indicating units and designs selected.
 - 3. Maintenance data and cleaning requirements for exterior surfaces.
- B. Shop Drawings:
 - 1. Prior to construction of the items outlined in the plans and details, the Contractor shall prepare and submit final construction "Shop Drawings" for review and approval by the Owner and Designer. Any deviation from the basic design format, details or materials specified must be approved by the Owner's representative.
 - 2. Submit Shop Drawings including design calculations of registered professional engineer, licensed to practice in the state of Georgia, covering all members, connections (welds, bolts, etc.) and footings, indicating such meets the Design Specifications for Sign Structures stress requirements and dead load deflection tolerances. Indicate mounting details for all sign types larger than one square foot of surface area wall surface or substrate. Wind load designs shall meet the requirements of the American Society of Civil Engineer's standard #ASCE 7-98 for computing sign structure wind loads and any local standards whichever is greater.
 - 3. Shop drawings shall include in addition to the items listed below complete details and schedules for fabrication and shop assembly of members, and details, schedules, procedures, and diagrams showing sequence of erection. Do not use reproductions of the Contract Documents for shop drawings.
 - 4. Shop Drawings shall indicate and illustrate:
 - a. Sign Materials, Sizes, Configurations
 - b. Construction Details and Processes
 - c. Fastening Materials and Devices, Applicable Substrate Mountings
 - d. Locations of Connections
 - e. Specifically indicate tolerances required from other sections for base mounting modules
 - f. Color Specifications and Finishes
 - g. Typography Identification
 - h. Typography Layouts for all sign faces including plaques
 - i. Details of coordination with other trades
 - j. Assembly Details
 - k. Installation Details
 - l. Provide Artwork for Special Graphics
 - m. Furnish templates for anchor locations
 - n. Wind and Load Calculations + Signed Engineered Drawings (Engineer Registered In The State of Georgia)
 - 5. Upon completion of the project, the Sign Contractor shall submit final "as-built" Shop Drawings to the Owner & Designer in a printed & electronic format (Adobe Acrobat).
- C. Material Samples:
 - 1. Samples of all materials to be used in the construction and installation of the graphics and signage program shall be submitted for review and approval prior to purchasing of materials for the work. This would include materials specified and those recommended by the Contractor or as an approved equal.
 - 2. Samples to be submitted include but are not limited to:
 - a. Sheet Materials Such As Aluminum, Acrylic, Photopolymer, Brass, Bronze, Etc.

- b. Plastic Laminate.
- c. Mechanical Fasteners.
- d. All extrusions to be used in the work (Steel, Aluminum, etc.)
- e. vinyl films.

D. Color and Finish Samples:

1. Samples of all color/finishes specified within the contract documents shall be submitted to the Owner or Owner's Representative for approval prior to application. All color and finish samples shall be clearly identified and labeled using the same color designation used by the Designer.
2. All paint color samples shall be submitted on .063" sheet aluminum, 8-1/2" x 11", three hole punched for insertion into a standard three ring binder. Three (3) of each color shall be submitted for review and approval.
3. All finish samples shall be submitted in the material specified (i.e. Aluminum, etc), approximate thickness shall be .063". The sample shall be 8-1/2" x 11" and shall be three hole punched for insertion into a standard three ring binder. Three (3) of each finish sample shall be submitted for review and approval.
4. All vinyl films shall be submitted in an 8-1/2" x 11" format and shall be three hole punched for insertion into a standard three ring binder. Three (3) samples of each color shall be submitted for review and approval.

E. Hardware Items: Submit samples of each type of anchor, insert or other fastener used in the project.

F. Product Data: The selected Contractor shall submit along with the Shop Drawing submittal, manufacturer's product data for all materials being used or proposed for use in the production and/or installation of the project.

G. Scheduling:

Submit the final schedule for construction of work and installation within ten (10) days of sample approvals. Indicate dates of completion for prototypical units for approval, dates of partial deliveries and total completion. Dates given shall be consistent with the time requirements submitted with the bid.

H. Templates: The Sign Contractor shall submit quarter size graphics templates showing the size, spacing, and positioning of all graphic components for review and approval by the Owner or Owner's Representative prior to production or application of the graphics.

I. Maintenance Instructions:

1. The Sign Contractor shall submit cleaning and maintenance instructions for sign type produced as a part of this project.
2. Instructions shall include recommended cleaning materials and frequency as well as alert notices for cleaning agents or processes which will damage the graphics.

1.06 QUALITY CRITERIA

A. The work performed under this contract shall, where applicable, be in accordance with the most current version of the following standard specifications unless otherwise specified:

1. Aluminum Association (AA) "Standards for Aluminum Mill Products", "Designation for Aluminum Finishes", and Standard for Anodically Coated Aluminum Alloy for Architectural Applications".
2. American Iron & Steel Institute (AISI)
3. American National Standards Institute (ANSI)
4. American Society for Testing Materials (ASTM)
5. Underwriters Laboratories (UL)

6. Concrete Reinforcing Steel Institute (CRSI)
7. Manual of Uniform Traffic Control Devices (MUTCD)
8. National Electrical Code (NEC)
9. Americans With Disabilities Act (ADA)
10. National Fire Protection Association – Life Safety Code (NFPA)
11. Manual Uniform Traffic Control Device (MUTCD)

- B. The Sign Contractor shall be familiar with all Federal, State and Local laws, ordinances, rules and regulations that may affect the work to be performed in this document. Ignorance of the aforementioned on the part of the Sign Contractor shall in no way waive responsibility for performing the work within them.

1.07 JOB CONDITIONS

- A. Field Verification of Existing Conditions and Dimensioning: Take field measurements to determine exact sizes prior to submittal of shop drawings and production of signage. Indicate exact sizes and existing field conditions for mounting details and all other information on shop drawings.
- B. Store materials to be installed where directed by the Owner.
- C. Maintain neat, clean conditions in working areas; remove trash, rags and waste materials at end of each day's work. Protect materials against damage or defacement.
- D. Close any open containers at end of day's work. Leave no materials open.
- E. Acrylic and other glazing materials or finish materials with or requiring protective wrapping shall only have this protection removed as required during fabrication and installation and once the area is clear of work or activities which might cause damage to the installed work. Care shall be taken in handling surfaces and products to prevent scratching, chipping, or cracking.
- F. Protection: Cover finished work of other trades and/or the existing property of the Owner and/or prefinished items and surfaces.
- G. Store materials a minimum of 4" above ground on framework or blocking and cover with protective waterproof covering. Provide air circulation and ventilation. Store in dry, conditioned space.
- H. Environmental Requirements:
1. Comply with manufacturer's recommendations regarding environmental conditions under which materials/coatings may be applied.
 2. No materials/coatings shall be applied in spaces where dust is being generated which may affect the finish surface or durability of the product.
 3. After the contract has been awarded, the Sign Contractor must conduct an on-site inspection of all existing conditions as they relate to the location of planned graphics and signage. This inspection should be conducted with an Owner's Representative.
 4. The Sign Contractor shall field verify all conditions and dimensions shown on the Design Specification Drawings. Any conflict between the dimensions shown in the Design Specification Drawings and field verified conditions shall be brought to the attention of Owner's Representative in writing for verification and/or resolution. It is the Sign Contractor's ultimate responsibility to manufacture the Signage and Graphics to meet the on-site conditions at the time of installation.

1.08 SEQUENCING AND SCHEDULING

- A. Coordinate:
 - 1. Installation with adjacent finish materials not destroying adjacent surfaces.
 - 2. With other sections for cast-in or built-in anchors and mounting hardware required in work accomplishes in other sections.

1.09 WARRANTY

- A. A minimum one-year warranty must be submitted to the Owner and a copy submitted to the Designer to cover the following:
- B. All fabrication shall be warranted against defects resulting from the use of inferior materials, equipment, or poor workmanship. If, within the one-year period, repair and/or compensation are required that result from these problems, the Sign Contractor shall promptly:
 - 1. Correct all fabrication defects;
 - 2. Make compensation for all damages to the site that result from the use of inferior materials, equipment or workmanship;
 - 3. Be liable for all personal injuries that result from the use of inferior materials, equipment or workmanship.
- C. A minimum one-year warranty must be submitted for the installation of the graphics and signage.
 - 1. The warranty is to state that the Sign Contractor is responsible for a safe, sound, secure and as vandal-proof as possible graphics/signage installation. If, within the one-year period, repairs and/or compensation are needed that result from unsafe or unsound sign installation, or lack of proper engineering, the Sign Contractor shall promptly:
 - a. Correct the installation to make it safe, sound and secure;
 - b. Compensate for all damages to the site that result from unsafe, unsound, or insecure installation;
 - c. Be liable for all personal injuries that result from unsafe, unsound or insecure installation.
- D. A minimum one-year warranty must be submitted on all painted surfaces, finishes and sign panel graphics. This warranty should cover peeling, cracking, blistering, discoloring, and all other abnormal occurrences regarding the painted surfaces, finishes, or sign panel fabrication / application.
- E. A minimum one-year warranty must be submitted on material life and a warranty against cracking, peeling and discoloring of all vinyl graphics. The guarantee period for each item above begins on the date that a written project approval or final payment is received by the Sign Contractor from the Owner or Owner's Representative.

1.010 GRAPHICS, ARTWORK AND ELECTRONIC FILES

- A. For graphics specified in the drawings, the designer shall only furnish graphic design electronic files in a format that already exists or was created during designing the project. Files are likely to have been prepared in graphic design industry standard computer software on PC platform computer hardware. The contract document drawings and layouts for the work shall not be transferred or transmitted to the contractor. Contractors are responsible for obtaining any necessary fonts and software that are used in the work or that will enable the contractor to open any files requested from the designer.

PART 2 - PRODUCTS

2.01 GENERAL

- A. The design intent for this project is that the Sign Contractor shall use, whenever, possible, standard size and readily available materials to reduce the cost of manufacturing the contents of this package. All materials shall be of the highest quality and shall meet all industry standards.
- B. All materials used in the construction and installation of this project shall be non-corrosive.

2.02 ALUMINUM POLE

- A. 3" OD Extruded Smooth Aluminum Pole :
 - 1. Comply with the following industry standards:
 - a. 3" OD
 - b. 2.75" ID
 - c. Min. .125" Wall
 - d. Min. 12' length
- B. Pole Base
 - 1. Model SB-33 Manufactured by Brandon Industries or approved equal
 - a. Two-Piece Cast Aluminum Base for 3" OD Round Pole
 - b. 24" height, 7" Width
- C. Finial
 - 1. Model: FINA3 Manufactured by Brandon Industries or approved equal
 - 2. Cast Aluminum, Acorn Finial for 3" OD
 - 3. Height: 6.75", Width 3.125"
- D. Sign Trim / Frame
 - 1. Cast aluminum sign trim to fit sign panel dimensions as shown on the plans and details.
- E. Sign Panel
 - 1. Aluminum panels, signs must meet MUTCD standards for sheeting requirements.
 - 2. Refer to plans for sizes and types of signs.
 - 3. Shop drawings for Custom sign graphic panels must be approved prior to ordering.

2.03 FASTENERS & HARDWARE

- A. All fasteners used in the production or installation of this project shall be non corrosive, and be installed in a manner that will not create potentially corrosive imperfections in other materials/environments.
- B. All fasteners to be utilized in the manufacturing and installation of this project shall be identified on the shop drawings and samples submitted to the Architect for final review and approval.

PART 3 - EXECUTION

3.01 GENERAL

- A. Written dimensions shall take precedence over scaled dimensions on all drawings.

- B. If a disagreement is found between the written specifications and/or message schedule and those found on the specification drawings, or within the written specifications themselves, the Sign Contractor shall submit a written notice of the discrepancy to the Designer for clarification. If the discrepancy will affect the bid submittal the written notification shall be submitted at least five days prior to the bid due date so that a clarification notice may be prepared and submitted to all bidders. If the disagreement is discovered at a time such that formal clarification cannot be forwarded to all bidders, then the bidder shall submit the bid based on the written specifications. Written specifications shall take precedence over notes found on the drawings.
- C. The Sign Contractor shall be responsible for the engineering of all signage construction details and signage installation details for the signage being produced as part of this contract. The seal and signature of an engineer registered in the State of Georgia shall be included on all shop drawings along with all calculations related to the approval of engineered details. Neither the Owner, or the Designer shall be held liable for any liability resulting from negligence on the part of the Sign Contractor and/or the Sign Contractor's Engineering Consultant for damage or bodily harm related to signage construction details or installation details.

3.02 CONSTRUCTION AND FABRICATION WORKMANSHIP

A. Aluminum Fabrication:

1. All sign faces are to be smooth and even, free from imperfections and disfiguring caused process such as welding, fasteners, ungrounded welds, "oil-canning", puckering or any other conditions not specifically mentioned herein, prior to application of paint, vinyl, ink, etc.
2. All finish work, unless specified on the drawings, shall be smooth, free from abrasion, tool marks, visible welds, exposed fasteners or similar defects prior to application of paint, vinyl, ink, etc.
3. All corners, reveals, and joints shall be milled to match adjoining pieces and shall be fabricated to match the dimensions indicated in the approved Sign Shop Drawings.
4. No brake bending or forming of the exterior corners of the sign units shall be acceptable unless otherwise noted in the Sign Specification Drawings. All aluminum parts shall be saw cut. All external welds shall be continuous, filled and ground smooth so that the finished seams are not visible in the finished product.
5. Internal welds shall be structurally sound and eliminate racking.
6. There shall be no bare aluminum in contact with any other metals, woods or concrete. Contact surfaces shall be separated by a heavy body bituminous paint or by a gasket.
7. Seams which must occur in a sign face, shall be filled and finished smooth prior to priming and painting of the finished sign unit. Seams shall not be visible in the finished product and shall be constructed in a manner that will insure that the finished seam will not "crack" or "protrude" over time.

B. Typography & Graphics:

1. The Sign Contractor is responsible for providing or obtaining all symbol artwork used in this project and illustrated in the Symbol Specifications or Specification Drawings. All symbols, to be used in this project must be shown in the submitted shop drawings for approval prior to production.

2. Typefaces and symbols for this project are illustrated in the Typography & Symbol Specifications of this document. The Sign Contractor is responsible for using the exact typefaces and symbols illustrated in the Sign Specification Drawings. If the Sign Contractor is unsure of a typeface's identity or a symbol's details, the Sign Contractor shall consult with the Designer.
3. Silk Screened Graphics
 - a. All photo silk screened graphics shall be sharp, without irregular or serrated edges, and exactly true to letter style or design form.
 - b. All ink applications shall be applied per the manufacturers recommended specifications for the surface on which the ink shall be applied.
 - c. Ink shall not be applied until the preceding coat has dried.
 - d. Application of ink shall be even and consistent without variation in the color. The ink application shall be opaque to avoid "shadowing" from background colors.
 - e. All Silk-screen inks used shall be those specified by the manufacturer for interior or exterior use.
4. Applied Screened Graphics
 - a. All vinyl typography, symbols and graphics shall be precision machine cut utilizing current computer capabilities. Only in exceptional cases is hand cutting of vinyl graphics permitted and must be disclosed at time of bid submittal.
 - b. All vinyl graphics shall be cut sharp and even without serrated edges, and exactly true to the graphics form.
 - c. Vinyl graphics shall be applied per the manufacturer's recommendations. Air bubbles or wrinkles in the finished surface will not be acceptable or approved.
 - d. In situations where the vinyl film is being applied to a painted surface, the Contractor must take precautions to insure that the painted surface has dried thoroughly to prevent damage to the vinyl caused by out-gassing of the curing paint surface.
 - e. All applied vinyl graphics shall be installed per manufacturer's specifications.

C. Color and Finish

1. Refer to the Sign Specification Drawings to determine the colors/materials for each signage or graphic element. Color & Material reference numbers are designated on the Sign Specification Drawings. Refer to the Color Schedule for color designations.
2. Coatings and finishes are to accurately match the colors specified by the Designer and color samples approved per the color submittal process.
3. All coating applications shall be smooth, even and consistently uniform. The cured surface shall have a uniform finish that matches the specified color and finish.
4. Color breaks that occur on the visible portions of the signage or graphics shall be sharp and even without serration or color bleed.
5. All splatters, drips, spills or over sprays shall be removed or corrected prior to final inspection by the Designer.
6. Exact identification of all coatings and finishes shall be identified in the Shop Drawing submittal and shall indicate the method of application.
7. All finished coatings and finishes shall receive a protective clear coat to aid in the durability of the finish as well as aid in the ease of cleaning.
8. All colors and finishes shall be applied per the manufacturer's specifications or recommendations for the material to receive the coating.

3.03 PRODUCT INSPECTION

- A. Prior to shipment to site for installation, all finished and completed graphics and signage shall be inspected in the contractor's shop by the Designer. All signage shall be completed, labeled and displayed in a manner that will provide for an expeditious review by the Designer.

3.04 LABELING, STORAGE, DELIVERY

- A. All products shall be stored in protective packaging to prevent damage. Any completed product must be stored in a bonded storage facility until installation.
- B. All sign products shall be packaged for protection from damage during shipment to the project site. All products shall be clearly labeled for easy identification while in the protective packaging. Identification shall include sign type number and sign location number per the contract drawings and plans.
- C. The Contractor is responsible for any damage which occurs during the shipment of graphics and signage related products to the project site.

3.05 INSPECTION OF SITE

- A. Surfaces to receive graphics and signage shall be free from defects and imperfections that would prevent an acceptable installation.
- B. Commencement of work in any space shall constitute acceptance by the Contractor of surfaces to receive signage as being in a satisfactory condition to permit an acceptable installation. If the Contractor's inspection of the application surfaces discloses unsatisfactory conditions, he shall notify the Designer in writing and await further instruction; otherwise, no claims will be considered for unsatisfactory work due to real or alleged faulty surfaces.

3.06 INSTALLATION, ERECTION, APPLICATION

- A. Perform work in accordance with the plans and details.
- B. Install decorative sign assembly in accordance with manufacturer's instructions at locations indicated on the drawings. Install decorative signage assembly plumb, and anchor decorative sign assembly securely in place.
- C. Minor damages to finish shall be repaired in accordance with the manufacturer's instructions and as approved by the Engineer. Remove and replace damaged components that cannot be successfully repaired as determined by the Engineer.
- D. If the Sign Contractor does not feel it will be possible to meet the final completion date due to the delay by the Owner's review of shop drawings, a written report must be submitted to The Owner and the Owner/Owner's Construction Manager outlining the specific areas of concern. This report must be filed at least two weeks prior to the installation deadline in order to avoid penalties being levied against the Sign Contractor.
- E. Signage locations: Prior to installation, the Sign Contractor and an Owner representative shall conduct a final walk through to stake out all sign locations.
- F. The Contractor is responsible for providing all materials and equipment necessary to properly locate and document the exact sign placement and orientation in the field.

1. Marking materials shall not disfigure or permanently mar the installation environment and must be removed immediately following signage installation.
 2. Sign markers shall indicate the Sign Location Number, Sign Type Number, and Sign Face if applicable.
- G. If the Sign Contractor elects to sub-contract graphics/signage installation, the Sign Contractor must have a Project Manager on-site at all times during the installation process.
- H. The Sign Contractor shall at all times guard from damage or loss, the areas around each sign, and shall replace or repair any loss or damage. The Owner may withhold payment or make such deductions as deemed necessary to insure reimbursement for loss or damage to property through negligence of the Sign Contractor or his agents. The Sign Contractor shall at all times guard against injury to persons within the sign facility site and the sign site.
- I. During the installation phase of the project, the Sign Contractor shall structure the work and provide adequate and qualified personnel to insure the least amount of inconvenience and interruption of normal daily activities of adjacent property owners/residents. Working hours shall have the approval of the Owner.
- J. All debris relating to signage installation must be removed from the areas of the project after completion of the installation phase.
- K. The Owner or an Owner Representative will conduct a post installation inspection of the sign units only after all signage and graphics are installed. To prevent damage to the sign units between installation and final review the Sign Contractor must take precautions to protect the individual sign units. In addition, the Sign Contractor must provide The Owner with a detailed installation schedule and completion time so that the final review may be conducted in a timely manner. Liability for sign units damaged between installation and final review shall be resolved between the Sign Contractor and the subcontractor for the sign if a subcontractor is used. Otherwise, all cost shall be borne by the Sign Contractor.
- L. Timing of Signage Installation / Hours of Installation shall be at the direction of the Owner.

3.03 PROTECTION

- A. Work in progress shall be protected at all times from staining, scratching, chipping or other damage.
- B. Provide final protection in a manner acceptable to the fabricator and installer until Date of Substantial Completion.
- C. Acrylic shall be removed from protective wrapping only as required to facilitate installation. Care shall be taken in handling acrylic sheets to prevent scratching, chipping or crazing.

3.04 CLEANING AND ADJUSTMENTS

- A. Clean exposed surfaces promptly after completion of installation in accordance with manufacturer's written cleaning instructions.
- B. Remove and replace damaged signage and graphics with new graphics free of defects.
- C. Clean exposed metal work with cleanser recommended by the manufacturer. Do not use harsh chemicals or abrasive matter in cleaning signage. Surfaces with stains or imperfections, which cannot be corrected or cleaned, shall be replaced to the satisfaction of the Owner without additional cost to the Owner.

- D. Signs shall be free of tape, packing paper, dirt smudges and other foreign materials.
- E. All installed signage and graphics shall be left level and fully cleaned on the Date of Substantial completion by the Contractor.

3.05 EXTRA PARTS

- A. Loose parts of sign assemblies, and/or special tools shall be itemized and supplied to the Owner upon completion of the project.

3.06 PAYMENT

- A. Payment for the decorative signage shall be lump sum and shall include all items such as concrete footing, pole, finial, sign frame, sign aluminum panels, finishes, graphics, sign attachment to pole, anchoring and installation of sign assembly. The payment is full compensation for all excavation, furnishing and installation of decorative signage, materials, disposal of materials, cost of furnishing all tools, safety devices, labor, equipment, and all other necessary items to complete the work.

END OF SECTION

PART I- GENERAL

1.01. RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02. RELATED WORK (Sections to consult)

- A. Section 02200 – Landscaping
- B. Section 02500 – Paving and surface
- C. Section 03000 – Concrete work
- D. Section 04200 – Masonry
- E. Division 16 Sections for electrical service and connections for motor operators, controls, limit switches other powered devices and for system disconnect switches

1.03. REFERENCES

American Society for Testing and Materials (ASTM), Fifth edition.

- ASTM-A82: Cold Drawn steel wire , Plain, for Concrete Reinforcement.
- ASTM-A185: Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.
- A123/A123M-02 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
- A 641 (1989) Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
- A1008 Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy (HSLA) and HSLA with Improved Formability
- A787-01 Standard Specification for Electric-Resistance-Welded Metallic-Coated Carbon Steel Mechanical Tubing
- A513-00 Standard Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing
- A653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
- A500 (1993) Standard Specification for Cold formed welded and seamless carbon steel structural tubing in round shapes.
- B 6 (1987) Standard Specification for Zinc
- B 117 (1990) Standard Test Method of Salt Spray (Fog) Testing.
- B 221 (1995) Standard Specification for Aluminum and aluminum-alloy extruded bars, rods, wire, shapes and tubes.
- D 2247 (1988) Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.
- D 2794 (1990) Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
- D 3359 (1990) Standard Test Methods for Measuring Adhesion by Tape.
- F 900 (1984) Standard Specification for industrial and commercial swing gates.
- F 934 (1989) Standard Specification for Standard Colors for Polymer-Coated Chain Link Fence Materials.
- F 1184 (1988) Standard Specification for industrial and commercial horizontal slide gates.
- F 1043-11A Standard Specification for Strength and Protective Coatings on Steel Industrial Chain Link Fence Framework
- F2919 Standard Specification for Welded Wire Mesh Fence Fabric (Metallic-Coated or Polymer Coated) with Variable Mesh Patterns or Meshes Greater than 6 sq. in. [3871 mm²] in Panels
- A121 Standard Specification for Metallic-Coated Carbon Steel Barbed Wire
- F626 Standard Specification for Fence Fittings

1.04. SUBMITTALS

- A. Product Data: Material descriptions, construction details, dimension of individual components and profiles, and finishes for the following:
 - 1. Fence and gate posts, rails, and fittings.
 - 2. Gates and hardware.
 - 3. Gate operators, including operating instructions.
 - 4. Motors: Show nameplate data, ratings, characteristics, and mounting arrangements.
- B. Shop Drawings: Show locations of fence, each gate, posts, rails, and details of gate swing, or other operation, hardware, and accessories. Indicate materials, dimensions, sizes, weights, and finishes of components. Include plans, elevations, sections, gate swing and other required installation and operational clearances, and details of post anchorage, attachment and bracing. Installation procedures and instructions by manufacturer describing all details for a typical fence and gates.
 - 1. Gate Operator: Show locations and details for installing operator components, switches, and controls. Indicate motor size, electrical characteristics, drive arrangement, mounting, and grounding provisions.
 - 2. Wiring Diagrams: Power and control wiring [and communication features] [and access control features]. Differentiate between manufacturer-installed and field-installed wiring and between components provided by gate operator manufacturer and those provided by others.
- C. Samples for Initial Selection: Manufacturer's color charts shown on its internet site.
- D. Samples for Verification: Request a color chip from the manufacturer.
- E. Qualification Data: For firms and persons specified in "Quality Assurance" article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- F. Maintenance Data: Request the maintenance manual for the gate operator.

1.05. SUBSTITUTE PRODUCTS

To enable all tenders to be judged equitably, they shall be based on the specified products in this document and shown on the drawings:

- A. The proposal for any substitute products must be attached to their tender separately, identifying the substitute product by its trade name along with any savings it may represent.
- B. Following the opening of the tender, only those substitutes proposed by the lowest bidder of the specified products will be considered.
- C. All substitute approval requests shall be accompanied by manufacturing drawings and specifications, and they meet all specifications for design, size gauge of metal parts and fabrication.
- D. Each substitute sample must be presented to the owner/consultant within seven days following the opening of tenders. After this time, the bidder will be required to supply the original specified product.
- E. The owner/consultant reserves the right to grant or deny approval for proposed substitutions without prejudice to this rights and his decision shall be final.

The above conditions apply to this section independently of any other clauses on the subject found in this document.

1.06. QUALITY ASSURANCE

A. Installer Qualifications: an experienced installer who has completed fences and gates similar in material, design, and extent to those indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. Source Limitations for Fences and Gates: obtain each color, grade, finish, type, and variety of components for fences and gates from one source with resources to provide fences and gates of consistent quality in appearance and physical properties.

C. Electrical Components, Devices, and Accessories: listed and labelled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

D. UL Standard: Provide gate operators that comply with UL 325.

E. Emergency Access Requirements: comply with requirements of authorities having jurisdiction for automatic gate operators serving as a required means of access.

1.07. PROJECT CONDITIONS

A. Existing Utilities: do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Architect not less than [two] <Insert number> days in advance of proposed utility interruptions.

2. Do not proceed with utility interruptions without Architect's written permission.

B. Field Measurements: verify layout information for fences and gates shown on drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

PART II - THE PRODUCT

2.01. MANUFACTURER:

OMEGA II FENCE SYSTEMS™

A division of Metaltech - Omega inc.
1735, St-Elzear west
Laval (Quebec), Canada
H7L 3N6

Tel: 800-836-6342 / 450-686-9600

Fax: 450-681-5318

Email: customerservice@omegatwo.com

Web site: www.omegafence.com

Products from qualified manufacturers who have five years or more experience manufacturing galvanized chain link fencing framework and swing gates will be considered by the architect if they meet all specifications for design, size, gauge of metal parts and fabrication.

Panel, eye-U-brackets and end-to end connector manufactured by Omega II Fence Systems. Other chain link fences hardware, posts and gates must be obtained from another single source.

2.02. COATINGS

A. Zinc coating:

1. The wire meshes is coated with 0.5 oz./sq.ft. (150 g/m²) zinc in conformity with ASTM A 641 (1989) Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire, known as galvanized before welding (GBW).
2. The fence posts, the swing gate frame and posts are zinc coated (galvalume process) – 0.90 oz/sq.ft. (275 g/m²) as per ASTM A653.

B. The polyester surface coating color shall be standard black or any optional color like dark green, textured taupe brown, see Omega Web site - or [color chart as per a RAL code].

Polyester coating to be minimum 4 mils applied by an electrostatic method. Coating shall cover all surfaces of the wire and post sections. Coating shall be capable of withstanding the following tests:

1. Mechanical adhesion test as per ASTM D 3359 (1990) - Method B.
2. Shock resistance tests as per ASTM D 2794 (1990).
3. Salt spray testing with a min. of 1,000 hrs without red rust appearance, as per ASTM B 117 (1990).
4. Humidity resistance in a weather meter chamber as per ASTM D 2247 (1988).
5. Exposure to ultraviolet light with exposure of 1000 hours using apparatus Type E and 63°C as per ASTM D1499

2.03. MATERIALS

2.03.1. MODEL "ELITE" FENCE AND ACCESSORIES

A. Height shall be: 4 ft. (1230 mm), 6 ft. (1830 mm), or 8 ft. (2430 mm) or a multiple of stacked panels.

B. **Model "ELITE" – Steel Mesh Fence Panels:** Fabricated welded wire mesh panels, 98-7/8" (2511mm) wide, formed by one vertical wire of 0.192" (4.88 mm) placed between two horizontal wires of 0.225" (5.72 mm), as per ASTM-A185 & A853. The wires are welded by resistance weld at each crossing to form rectangles 1-15/16" x 7 7/8" (50mm x 200mm). The cold rolled wire shall have a tensile strength of at least 75,000 psi (515 Mpa) and a 3150 lbs (1430 Kg) break strength for an individual wire. One end of the vertical wires of the panel shall exceed 1" (25 mm) from the last or first horizontal wire thereby creating a spiked top or bottom depending of its position when installed. The other end is cut flush. The mesh panel shall be zinc-coated steel wire conforming to specification ASTM A 641 (1989) Class 1. A 4 mils polyester powder coating is applied on the mesh.

Note: Panel camber may not exceed 0.094" (2.5 mm).

- C. **The 2” or 3” (50mm or 75 mm) Square posts** are to be installed in-ground and/or a flanged applications. The size and the gauge of the posts shall be as shown in table 2 for the various height dimensions: Unlike chain link there is no need for larger end or corner posts because the panels are self-supporting. The posts are cold rolled from 1008 grade steel and meet ASTM 500 and ASTM A787-01. Minimum requirement from the post selection performance table 1.

TABLE 1

Post Selection Performance table: Maximum Horizontal Load (lbs)

Typical available posts	4'H (1245 mm)	5'H (1549 mm)	6'H (1778 mm)	8'H (2464 mm)
2 x 2 (50x50) 16 Ga (1,6mm)	329	263	--/--	--/--
2 x 2 (50x50) 11 Ga (3,0mm)	578	463	385	289
3 x 3 (75x75) 11 Ga (3,0mm)	1383	1106	922	691

Minimum requirement for the 2” x 2” (50 mm x 50 mm) post: gauge 16 (1,6 mm) for 4'H (1230 mm) and 5'H (1524 mm) panel - gauge 11 (3,0 mm) for 6'H (1830 mm) and 8'H (2430 mm) panel.

The length of the posts are minimum 24 in. to 36 in. (610 mm to 914 mm) more than the actual height of the fence for installation in the ground depending on local land code requirements (frost line).

- D. **The 2” or 3” (50mm or 75 mm) Universal post bracket kits** :The ELITE attachment “ Universal bracket kit”, includes one of each part : 12 gauge (2,6mm) steel collar and wire retaining plate 1/4” x 1” (6,3mm x 25 mm), nut , washer and carriage bolt 5/16” x 1-1/4” (8,0mm x 32 mm), all galvanized steel. For 90° turn, used the same bracket. For different angles, used the “Universal angle brackets”.

The 2” or 3” (50mm or 75mm) U Shape Bracket kit : The attachment “ U Shape Bracket” includes the following components : a stainless steel U rod Ø5/16” (Ø8mm), a rear flange in PVC 3-1/2” x 1-1/2” x 1-1/8” (88.7mm x 37.8mm x 28.4mm), a forehead support in PVC 2-3/8” x 5/8” x 1-1/16” (60.4mm x 15.2mm x 27.5mm), cosmetic plastic caps and nuts (M8).

Bracket kit requirement per panel

Panels	Universal bracket	U Shape bracket
(4'H) 1230mm	6	6
(6'H) 1830mm	6	6
(8'H) 2430mm	8	8

- E. **The Special Panel Fitting - SPF** enables a panel to be fastened to any vertical or horizontal surface, such as a steel, concrete beam or a wood post. All hot dip galvanized.

When wanting to fasten the panel to something other than a post, [use one or more] of the (3) different models described below:

- 1) The **SPF-W kit**, for mounting on a vertical surface, consists of an L-shaped slotted plate, which accommodates a 1 ¾” (45mm) vertical adjustment and a retaining plate that holds two vertical wires when bolted together.
- 2) The **SPF-C kit**, for horizontal surfaces, uses the same “L” shaped slotted plate and (2) wire retaining plates.
- 3) The **SPF-P kit** connects two panels together.

- F. **Post caps**: are made out of an aluminum alloy for dimension posts 2 in. x 2 in. (50 mm X 50 mm), 3 in. x 3 in. (76 mm X 76 mm) and 4 in. x 4 in. (102 mm X 102 mm). For larger dimensions, the caps are made of galvanized steel.

- G. **Polyester powder coating:** (see article 2.02B)

- H. **Concrete:** Concrete Mixture: Normal-weight concrete with not less than 3000 psi (20.7 Mpa) compressive strength (28 days), 3 in. (75 mm) slump, and contain "coarse aggregate" of a minimum diameter of 0.2 in. (5 mm) to a maximum of 3/4" (20 mm) maximum size aggregate.

- I. **Option: Overhang:** the 45° extension have the same dimensions as the post 2 in. x 2 in. or 3 in. x 3 in. (50mm X 50mm or 75mm X 75mm) and measuring a minimum 1ft. 6-1/8 in. (460 mm) length. They are welded at the end of the square post by forming an angle of 45° and provided with two (2) kits of fasteners Universal by post to receive a panel of 1ft. 4-1/2 in. (420mm). Moreover larger dimensions are available on request.

- J. **Barbed wire supporting arms:** Pressed steel arms with provisions for attaching 3 rows of barbed wire. Arms shall withstand 250 lb. (113 kg) downward pull at outermost end of arm without failure. Arms are fastened to the posts.

- K. **Barbed wire:** Zinc or aluminum coated steel wire, double strand, 12 gauge, twisted line wire with 4 point barbs, spaced approximately (choose one) 3" (75 mm) or 5" (125 mm) on center conforming to ASTM A121.

2.03.2. SINGLE / DOUBLE SWING GATES

- A. **Gate frames:** Omega swing gates shall be made in accordance with ASTM F900 (1984) using galvanized square steel tube 16 ga (1.6 mm). The frame is made from two vertical tubes of 1-1/2 in. x 1-1/2 in. (38 mm X 38 mm) and from two horizontal tubes of 2 in. x 2 in. (50 mm X 50 mm) welded at intersections to create a rigid frame. If the gate is over 8 ft. (2430mm) high or 8 ft. (2430 mm) wide, a supplementary vertical support of 1-1/2 in. x 1-1/2 in. (38 mm X 38 mm) is needed.
 - If the gate height or width exceeds 7 ft. (2134 mm), both vertical tubes must be 11 Ga (3,0 mm)

- B. **The gate posts** are cold rolled from 1008 grade steel. Dimension corresponding Dimensions correspond Posts are to include cap and SPF-W kit for adjacent panel mounting.

Single frame gate opening	Square post size
6 ft. or less (1830 mm) or less	3 in. x 3 in. (76 mm X 76 mm)
6.1 ft. (1860 mm) to 13.5 (4115 mm)	4 in. x 4 in. (102 mm x 102 mm)
13.6 ft. (4145 mm) to 16 ft. (4875 mm)	6 in. x 6 in. (152 mm x 152 mm)
16 ft. (4876 mm) and over	Custom by manufacturer

The length of the posts are minimum 36 in. (914 mm) more than the actual height of the fence for installation in the ground depending on local land code requirements (frost line).

- C. **Mesh section:** (see article 2.03.1B).

- D. **Gate hardware:** in conformity with ASTM F900 (1984) for hinges, latch, drop rods, shall be hot-dip galvanized steel, and sized to assure proper gate operation. Non moving parts shall be powder coated.

- E. **Hinge:** structurally designed to support all gates without deformation during opening and closing.

- F. **Latch:** Clamp-on gravity system that is self latching.

- G. **Gate Keeper for double leafed models:** Gate keeper consist of mechanical device with gravity-lock system that fasten each gate leaf when in full open position.

H. **Double gates hardware:** Consists of

- 1) One drop bar to secure in closed position one of the gate leaves, complete with stop pipe to engage the center drop rod.
- 2) Self-locking device with padlock eyes as an integral part of latch.

I. **OPTIONAL Keyed lock-box: LOCINOX** [single-lever] or [double-lever] model.

2.03.3. CANTILEVER GATES

- A. **Omega II cantilever slide gates** shall be fabricated in accordance with ASTM F1184 Class 2 as well as F2200 when gate is automated. Gate frame members are all made of aluminum extrusions 6061-T6 following ASTM B221. Each gate frame consists of a top track, a bottom track, vertical uprights & diagonal braces. Components shall be welded together forming a rigid one-piece frame integrating the top & bottom track. Vertical uprights shall be positioned on the gate frame, up to approximately 8 ft. (2 438 mm) apart and dividing the opening section of the frame into equal sections as well as the tail section, each opening section will be reinforced with one (1) diagonal brace & each tail section will be cross braced using two (2) diagonal braces. Each gate having 30ft (9 144 mm) of opening or less includes; 2 truck assemblies with their support brackets, gate latch (if manually operated), gate catch, bottom stabilizing brackets & all hardware needed for installation. Gates over 26 ft. (7924mm) in single opening shall be shipped in 2 parts and field spliced with special attachments provided by manufacturer.

Gate single opening	Overhang length	Overall length
4 ft. (1 219 mm)	2 ft. (609 mm)	6 ft. (1 828 mm)
8 ft. (2 438 mm)	4 ft. (1 219 mm)	12 ft. (3 657 mm)
16 ft. (4 876 mm)	8 ft. (2 438 mm)	24 ft. (7 315 mm)
24 ft. (7 315 mm)	12 ft. (3 657 mm)	36 ft. (10 972 mm)
30 ft. (9 144 mm)	15 ft. (4 572 mm)	45 ft. (13 716 mm)

For gate openings 31 ft. (9 449 mm) to 40 ft. (12 192 mm), top track is replaced with a double top track weighing 7.42 lb/ft (11.06 kg/m). Double top track also requires additional truck assemblies, bracket systems & hardware.

Gate single opening	Overhang length	Overall length
31 ft. (9 448 mm)	15.5 ft. (4 724 mm)	46.5 ft. (14 173 mm)
40 ft. (12 192 mm)	20 ft. (6096 mm)	60 ft. (18 288 mm)

For gate openings 41 ft. (12 496mm) to 60 ft. (18 288mm), a 24 in. (609 mm) wide rigid box frame truss is made. The truss shall consist of two (2) side frames, constructed similar to the standard single gate, separated by square cross members & diagonal truss bridging. Each side frame shall have a single top track to provide support to the truss from both sides. 2 trucks per track will be provided for a total of 4 trucks for each gate. Opposite support posts will be joined at the top by welding a steel plate between them to maintain truck assemblies in alignment.

Gate single opening	Overhang
41 ft. (12 496 mm) to 60 ft. (18 288 mm)	Custom by manufacturer

- B. Mesh section: Panels will be sized for the fence sections of the gate opening, slid in place & secured using proper brackets & hardware (see article 2.03.1B).
- C. Vertical Uprights are 2 in. X 2 in. (50 mm x 50 mm) 6061-T6 aluminum square extrusion weighing 1.02 lb/ft (1.52 kg/m). Their number & position will be determined by the opening.
- D. Bracing will be done with 1 in. X 2 in. (25 mm x 50 mm) 6061-T6 aluminum rectangular extrusion weighing 0.81 lb/ft (1.21 kg/m). Their number & position will be determined by the opening.

- E. Top Track is a 6061-T6 aluminum extrusion weighing 5.43 lb/ft (8.09 kg/m). It combines the necessary features for the gate to slide and to facilitate welding assembly. Track will resist a reaction load of 2000 lb (907 kg).
- F. Bottom Track is a 6061-T6 aluminum extrusion weighing 3.37 lb/ft (5.02 kg/m). It combines the necessary features for the gate to resist swaying & to facilitate welding assembly.
- G. Truck Assembly: Swivel type, zinc plated body with 4 sealed & lubricated ball bearings, 2 in. (50 mm) in diameter by 9/16 in. (14 mm) in width, and 2 horizontal rolling wheels to ensure truck alignment in track. Trucks mount on post brackets using 3/4 in. (19 mm) diameter machined stud with reduced shank. Truck assembly designed to withstand same reaction load as track.
- H. Gate accessories & hardware: Malleable iron or steel, galvanized after fabrication. Latches provide the possibility for padlocking.
- I. Bottom Guide: Each assembly shall consist of one (1) 2 in. (50 mm) diameter ball bearing hidden inside the bottom track, adjustable in height to maintain gate frame plumb and in proper alignment.
- J. Gate Posts: Gate posts shall be 4 in. (100 mm) hot-dipped galvanized steel square sections weighing 7.2 lb/ft (10.7 kg/m). Pipe shall have a minimum 1.8 oz/sq.ft. (549 g/m²) zinc coating meeting ASTM F1234. The steel shall meet requirements of ASTM A500, Grade B with a minimum yield strength of 40,000 psi (276 MPa). Provide 1 latch post and 2 support posts for single slide gate and 4 support posts for double track slide gates. Bi-parting will require twice the amount of support posts but no latch post. The length of the posts are minimum 36 in. (914mm) more than the actual height of the fence for installation in the ground depending on local land code requirements (frost line).
- K. Coatings:
 - 1.Paint primer:
 - a. Epoxy-vinyl paint primer is applied to cantilever gate aluminum frame in 1 layer by spray paint process. Primer shall cover all visible surfaces.
 - 2.Paint Frame coat:
 - a. The acrylic surface coating color shall be standard black or any optional color, see Omega Web site – or color chart as per RAL code.
 - b. Acrylic coating is applied in 1 layer by spray paint process.
 - 3.Panel coat: (See article 2.02 B)
- L. Concrete: (See article 2.03.1H)

2.04. GATE OPERATOR [\(Note\)](#)

(This section describes typical gate operator systems. For detailed precisions and supplementary information, please contact gate operator vendors.)

A. General: Provide factory-assembled automatic gate operation system designed for gate size, type, weight, construction, use, traffic-flow patterns, and operation frequency. Provide operation system for gate specified, of size and capacity and with features, characteristics, and accessories suitable for Project conditions, recommended [and provided]by gate manufacturer complete with electric motor and factory-prewired motor controls, remote-control stations, control devices, power disconnect switch, obstruction detection device, lockable weatherproof enclosures protecting controls and all operating parts, and accessories required for proper operation. Provide enclosures with corrosion-resistant-protective and decorative finish and two keys per lock. Include wiring from motor controls to motor. Coordinate operator wiring requirements and electrical characteristics with building electrical system.

- 1. Provide operator designed so motor may be removed without disturbing limit-switch adjustment and without affecting auxiliary emergency operator.
- 2. Provide operator with UL [approval] [-approved components].

3. Provide electronic components with built-in troubleshooting diagnostic feature.
 4. Provide unit designed and wired for both right-hand/left-hand opening, permitting universal installation.
- B. Comply with NFPA 70.
- C. Control Equipment: Comply with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6, with NFPA 70, Class 2 control circuit, maximum 24-V ac or dc.
- D. Electrohydraulic Operation: Provide unit designed for [gate] [surface] [concrete base/pad] [pedestal] [post] <Insert mounting> mounting; consisting of electric motor, pump, hydraulic actuator to suit gate type, valves, [heater to maintain constant temperature,] and [cold-weather] hydraulic fluid[; with hydraulic locking in both directions].
- E. Electromechanical Operation: Provide unit designed for [gate] [surface] [concrete base/pad] [pedestal] [post] <Insert mounting> mounting; consisting of electric motor and factory-prewired motor controls, starter, speed control device, chain-drive assembly, [brake,] clutch or torque limiter, and as follows:
1. Enclosed worm gear reducer, roller chain drive.
 2. Enclosed worm gear and chain and sprocket reducers, roller chain drive.
 3. V-belt and [worm gear] [chain and sprocket] reducers, roller chain drive.
 4. Enclosed worm gear reducer, wheel and rail drive.
- F. Operation Cycle Requirements: Design gate operator to operate for not less than the following duty and cycles per hour. One cycle equals one gate opening plus one gate closing.
1. Medium Duty: 10 cycles per hour.
 2. Heavy Duty: 25 cycles per hour.
 3. Peak Duty: 20 cycles per hour at peak periods.
 4. <Insert requirements for duty and cycles per hour or day.>
- G. Gate Operation Speed: [Minimum 45 fpm (0.229 m/s)] [Minimum 60 fpm (0.305 m/s)] <Insert speed>.
- H. Electric Motors: High-starting torque, [reversible,] [single-direction,] continuous-duty, insulated electric motors, complying with NEMA MG 1, sized to start and operate size and weight of gate considering Project's service conditions without exceeding nameplate ratings or considering service factor.
1. Service Factor: According to NEMA MG 1, unless otherwise indicated.
 2. Enclosure: [Totally enclosed, nonventilated or fan-cooled motors, fitted with plugged drain] <Insert another enclosure>.
 3. Thermal Protection: Internal [manual] [automatic] reset.
 4. Motors Smaller Than 1/2 hp: [Single phase] [Polyphase], <Insert voltage rating,> 60 Hz. [Motor horsepower as recommended by operator manufacturer] [Motor horsepower as indicated on Drawings] <Insert motor horsepower>.
 5. Motors 1/2 hp and Larger: Polyphase, <Insert voltage rating,> 60 Hz. [Motor horsepower as recommended by operator manufacturer] [Motor horsepower as indicated on Drawings] <Insert motor horsepower>.
- I. Remote Controls: Electric controls separated from gate and motor and drive mechanism, with [NEMA ICS 6, Type 1] [NEMA ICS 6, Type 4] <Insert another type of enclosure> enclosure for [surface] [recessed or flush] [concrete base/pad] [pedestal] [post] <Insert mounting> mounting, and with space for additional optional equipment. Provide the following remote-control device(s):
1. Control Station: Keyed, two-position, switch-operated control station located remotely from gate, with on and off functions. Provide two keys per station.
 2. Control Station: Keyed, three-position, switch-operated control station with open and close functions and spring return to off position [with stop button]. Provide two keys per station.
 3. Control Station: Momentary-contact, single-button-operated control station with open and close functions.
 4. Control Station: Momentary-contact, three-button-operated control station with open, close, and stop positions, [and with key switch to lock out open and close buttons. Provide two keys per station].

5. Card Reader: Functions only when authorized card is presented. Magnetically coded, single-code system activated by coded card [and permitting four different access time periods]. Provide insertion-reader-type, face-lighted unit fully visible at night.
6. Card Reader: Functions only when authorized card is presented. Easily programmable, multiple-code capability permitting validating or voiding of individual cards [and permitting four different access time periods]. Provide face-lighted unit fully visible at night.
- Reader Type: [Touch plate] [Swipe] [Insertion] [Proximity].
 - Features: [Timed anti-passback] [Limited-time usage] [Capable of monitoring and auditing gate activity].
7. Digital Keypad Entry Unit: Functions only when authorized code is entered. Multiple-code capability of not less than [5] [100] [500] <Insert another number to suit Project> possible individual codes.
8. Digital Keypad Entry Unit: Functions only when authorized code is entered. Easily programmable, multiple-code capability permitting validating or voiding of not less than [100] [2500] [10,000] <Insert another number to suit Project> possible individual codes, consisting of [1 to 6] <Insert number> digits, [and permitting four different access time periods]. Provide face-lighted unit with [metal-keyed] [keyless-membrane] keypad fully visible at night.
- Features: [Timed anti-passback] [Limited-time usage] [Capable of monitoring and auditing gate activity].
9. Radio Control: Digital system consisting of code-compatible universal coaxial receiver, [one per gate] [where indicated on Drawings], remote antenna with coaxial cable and mounting brackets, and [one permanently mounted] [four portable] <Insert number and use condition to suit Project> transmitter[s] per receiver designed to operate gates. Provide easily programmable transmitter with multiple-code capability permitting validating or voiding of not less than [1000] [10,000] <Insert another number to suit Project> codes per channel configured for the following functions:
- Transmitters: Single-button operated, with open function.
 - Transmitters: Single-button operated, with open and close functions.
 - Transmitters: Three-button operated, with open, close, and stop functions.
 - Provide transmitters featuring [two] [three] [four] <Insert another number to suit Project> independent channel settings controlling separate receivers for operating more than one gate from each transmitter.
10. Telephone Entry System: Hands-free voice-communication system for connection to building telephone system with digital-entry code activation of gate operator [auxiliary keypad entry].
- Residential System: Designed to be wired to same line with telephone.
 - Multiunit System: Designed to be wired to a dedicated telephone line, with capacity to access [20] [100] <Insert number> telephones [and with electronic directory].
11. Vehicle Loop Detector System: System including automatic closing timer with adjustable time delay before closing [timer cut-off switch] and loop detector designed to [open and close gate] [hold gate open until traffic clears] [reverse gate] <Insert function>. Provide electronic detector, with adjustable detection patterns, adjustable sensitivity and frequency settings, and panel indicator light designed to detect presence or transit of a vehicle over an embedded loop of wire and to emit a signal activating the gate operator. Provide number of loops consisting of multiple strands of wire, number of turns, loop size, and method of placement at location shown on Drawings, as recommended in writing by detection system manufacturer for function indicated.
- Loop: Wire, in size indicated for field assembly, and sealant; style for [pave-over] [saw-cut] installation.
 - Loop: Factory preformed in size indicated; style for [pave-over] [saw-cut] installation.
12. Vehicle Presence Detector: System including automatic closing timer with adjustable time delay before closing [timer cut-off switch] and presence detector designed to [open and close gate] [hold gate open until traffic clears] [reverse gate] <Insert functions>. Provide [retroreflective] [emitter/receiver] type detector, with adjustable detection zone pattern and sensitivity, designed to detect the presence or transit of a vehicle in gate pathway by interrupting an infrared beam in zone pattern and to emit a signal activating the gate operator.
- J. Obstruction Detection Devices: Provide each motorized gate with automatic safety sensor(s). Activation of sensor(s) causes operator to immediately function as follows:
- Action: Reverse gate in both opening and closing cycles and hold until clear of obstruction.
 - Action: Stop gate in opening cycle and reverse gate in closing cycle and hold until clear of obstruction.
 - Internal Sensor: Built-in torque or current monitor senses gate is obstructed.

4. Sensor Edge: Contact-pressure-sensitive safety edge, profile, and sensitivity designed for type of gate and component indicated, in locations as follows. Connect to control circuit using [take-up cable reel] [self-coiling cable] [gate edge transmitter and operator receiver system].

- a. Along entire gate leaf leading edge.
- b. Along entire gate leaf trailing edge.
- c. Across entire gate leaf bottom edge.
- d. Along entire length of gate posts.
- e. Along entire length of gate guide posts.
- f. Where indicated on Drawings.
- g. <Insert extent and location.>

5. Photoelectric/Infrared Sensor System: Designed to detect an obstruction in partition's path by interruption of an infrared beam in the zone pattern without obstruction contacting gate.

K. Limit Switches: Adjustable switches, interlocked with motor controls and set to automatically stop gate at fully retracted and fully extended positions.

L. Emergency Release Mechanism: Quick disconnect release of operator drive system of the following type of mechanism, permitting manual operation if operator fails. Design system so control circuit power is disconnected during manual operation.

1. Type: Integral fail-safe release, allowing gate to be pushed open without mechanical devices, keys, cranks, or special knowledge.
2. Type: Mechanical device, key, or crank-activated release.

M. Operating Features: Include the following:

1. Digital Microprocessor Control: Electronic programmable means for setting, changing, and adjusting control features [with capability of monitoring and auditing gate activity]. Provide unit that is isolated from voltage spikes and surges.
2. Fully Systems Compatible: With controlling circuit board capable of accepting any type of input from external devices.
3. Master/Slave Capability: Control stations designed and wired for gate pair operation.
4. Automatic Closing Timer: With adjustable time delay before closing [and timer cut-off switch].
5. Open Override Circuit: Designed to override closing commands.
6. Reversal Time Delay: Designed to protect gate system from shock load on reversal in both directions.
7. Maximum Run Timer: Designed to prevent damage to gate system by shutting down system if normal time to open gate is exceeded.
8. Clock Timer: [24-hour] [Seven-day] <Insert time period> programmable for regular events.

N. Accessories: Include the following:

1. Mounting kit [including pedestal].
2. Audio Warning Module: Provide ADA-compliant audible alarm sounding three to five seconds in advance of gate operation and continuing until gate stops moving.
3. Visual Warning Module: Provide ADA-compliant visible [constant-] [strobe-] light alarm sounding three to five seconds in advance of gate operation and continuing until gate stops moving.
4. Battery Backup System: Battery-powered drive and access control system, independent of primary drive system, opening gate if power fails. <Insert additional requirements.>
5. External electric-powered lock with delay timer allowing time for lock to release before gate operates.
 - a. Type: [Solenoid] [Magnetic] for swing gate.
 - b. Type: [Solenoid] [Magnetic] for slide gate.
6. [Fire] [Postal] box.
7. Fire [strobe] [siren] sensor.
8. Intercom System: <Insert requirements.>
9. Instructional, Safety, and Warning Labels and Signs: [According to UL 325] [Manufacturer's standard for components and features specified] [As indicated on Drawings] <Insert requirements>.

PART 3 – EXECUTION

3.01. EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for [a verified survey of property lines and legal boundaries,] site clearing, earthwork, pavement work, and other conditions affecting performance.
 - Do not begin installation before final grading is completed, unless otherwise permitted by Architect.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02. PREPARATION

Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of 500 ft. (152.5 m) or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.

3.03. INSTALLATION GENERAL

- A. Install fencing on established boundary lines inside property line
- B. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacing indicated, in firm, undisturbed or compacted soil.
- C. Post Setting: Set posts in concrete footing. Protect portion of posts above ground from concrete splatter. Place concrete around posts and consolidation. Using mechanical devices to set posts is not permitted. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during placement and finishing operations until concrete is sufficiently cured.
 - 1. Dimensions and Profile: As indicated on Drawings.
 - 2. Space line posts uniformly at center to center.
 - 3. Exposed Concrete Footings: Extend concrete 2 in. (50 mm) above grade, smooth, and shape to shed water.
 - 4. Concealed Concrete Footings: Stop footings 2 in. (50 mm) <Insert dimension> below grade [as indicated on Drawings] to allow covering with surface material.
 - 5. Posts Set into Concrete in Sleeves: Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts have been inserted into sleeves, fill annular space between post and sleeve with [non shrink, non-metallic grout,] [anchoring cement,] mixed and placed to comply with anchoring material manufacturer's written instructions, and finished sloped to drain water away from post.
 - 6. Posts Set into Concrete in Voids: Form or core drill holes not less than 5 in. (125 mm) deep and ¾ in. (20 mm) larger than OD of post. Clean holes of loose material, insert posts, and fill granular space between post and concrete with [non shrink, non-metallic grout,] [anchoring cement,] mixed and placed to comply with anchoring material manufacturer's written instructions, and finished sloped to drain water away from post.
 - 7. Flange Post Installation: Bolt mounting plates attached to each post to slab or structure as indicated, using expansion bolts.

3.04. FENCE INSTALLATION – Model ELITE

- A. Terminal Posts: Locate terminal end, corner, and gate posts at changes in horizontal or vertical alignment of [15 degrees or more] [30 degrees or more] [as indicated on Drawings] <Insert requirement>.
- B. Square post installation 2 in. or 3 in. (50 mm or 75 mm): Post hole shall be a minimum of 8 in. (200 mm) in diameter and 42 in. (1070 mm) in depth. Once the concrete is set, the mesh sections are installed with the Universal Bracket kits 2 in. or 3 in. (50mm or 75 mm), always install flush with horizontal wire of the panel (no gap). Post spacing are for 2 in.(50mm) post 97-3/4 in. (2483 mm) c/c with an adjustment of $\pm 1-1/2$ in. (38 mm) and for the 3 in.(75mm) post 98-3/4 in. (2508 mm) c/c of the post with an adjustment of $\pm 1-1/2$ in. (38 mm) on each side.
- C. For the fence to follow slopes, it is required to step the fence sections. The Universal bracket on square posts can be slid along the post at the desired height and should always be install flush with horizontal wire (no gap).
- D. When faced with a steep slope, it will be necessary to order longer posts and panels cut in half as to keep the gap under the panel to a minimum.
- E. Mesh Panels: Vertical wire extensions [pointing up for security or down for safety]. The fence panel shall be installed a distance of a minimum of 1-1/4 in. (30 mm) and maximum of 2 in. (50 mm) above the ground surface.
- F. Upon cutting or trimming, a post or a wire mesh section, apply a zinc rich primer to the exposed ends and finish with the matching touch-up paint supplied by the manufacturer.

3.05. CAST-IN-PLACE CONCRETE

- A. General: Comply with ACI 301 for cast-in-place concrete.
- B. Materials: Portland cement complying with ASTM C 150 <Insert type if required>, aggregates complying with ASTM C 33, and potable water [for ready-mixed concrete complying with ASTM C 94]. [Measure, batch, and mix Project-site-mixed concrete according to ASTM C 94.]
 - 1. Concrete Mixture: Normal-weight concrete with not less than 3000 psi (20.7- Mpa) compressive strength (28 days), 3-inch (75-mm) slump, and contain " coarse aggregate " of a minimum diameter of 1/5 in. (5 mm) to a maximum of 3/4 in. (20 mm) maximum size aggregate. A 5% to 7% air entrained or according to recommendation of section 03000.
- C. Materials: Dry-packaged concrete mix complying with ASTM C 387 for normal-weight concrete mixed with potable water according to manufacturer's written instructions.

3.06. GROUT AND ANCHORING CEMENT

- A. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout, recommended in writing by manufacturer, for exterior applications.
- B. Erosion-Resistant Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with potable water at Project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended in writing by manufacturer for exterior applications.

3.07. GATE INSTALLATION & ADJUSTMENT

- A. Install gate posts in accordance with manufacturer's instructions.
- B. B .Concrete Set Gate Posts: Drill holes in firm, undisturbed or compacted soil. Holes shall have a diameter 4 times greater than outside dimension of post, and depths approximately 6 in. (152mm) deeper than frost level. Excavate deeper as required for adequate support in soft and loose soils, and for posts with heavy lateral loads. Set post bottom 36 inches (914mm) below surface when in firm, undisturbed soil. Place concrete around posts in a continuous pour, tamp for consolidation. Trowel finish around post and slope to direct water away from posts. Check each post for vertical and top alignment, and maintain in position during placement and finishing operations.
- C. Install gates perfectly horizontal and levelled (at junction), plumb, and secure for full opening without interference.
- D. D. Attach hardware so to have the nuts inside the property thus making the assembly tamper-proof which will prevent unauthorized removal. Install ground-set items in concrete for anchorage.
- E. Adjust hardware for smooth operation and lubricate where necessary to operate smoothly, easily, and quietly, free from binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.

3.08. GATE OPERATOR INSTALLATION

(Indicative only. Consult local professional for proper design.) (See notes section 2.4.)

- A. General: Install gate operators according to manufacturer's written instructions, aligned and true to fence line and grade.
- B. Excavation for [Support Posts] [Pedestals] [Concrete Bases/Pads]: Hand-excavate holes for bases/pads, in firm, undisturbed or compacted soil to dimensions and depths and at locations as required by gate operator component manufacturer's written instructions and as indicated on Drawings.
- C. Concrete Bases/Pads: Cast-in-place or precast concrete, made of not less than 20.7-Mpa (3000-psi) compressive strength (28 days), [depth not less than 12 in. (300 mm)] <Insert depth 6 in. to 12 in. (150 to 300 mm) below frost line or detail on Drawings>, dimensioned and reinforced according to gate operator component manufacturer's written instructions and as indicated on Drawings.
- D. Vehicle Loop Detector System: [Cut grooves in pavement and] bury and seal wire loop according to manufacturer's written instructions. Connect to equipment operated by detector. Comply with NFPA 70 and manufacturer's written instructions for grounding of electric-powered motors, controls, and other devices.

3.09. GROUNDING AND BONDING

(Indicative only. Consult local professional for proper design.)

- A. Fence Grounding: Install at maximum intervals of [1500 ft. (450 m)] <Insert a lesser distance where grounding resistance is high> except as follows:
 - 1. Fences within 100 ft. (30 m) of Buildings, Structures, Walkways, and Roadways: Ground at maximum intervals of [750 ft. (225 m)] <Insert a lesser distance where grounding resistance is unusually high>.
 - 2. Gates and Other Fence Openings: Ground fence on each side of opening.
 - 1.1 Bond metal gates to gate posts.
 - 1.2 Bond across openings, with and without gates, except openings indicated as intentional fence discontinuities. Use No. 2 AWG wire and bury it at least 18 in. (460 mm) below finished grade.
 - 3. Conductors: Bare, solid wire for No. 6 AWG and smaller; stranded wire for No. 4 AWG and larger.
 - 3.1. Material Above Finished Grade: [Copper] [Aluminum].
 - 3.2. Material On or Below Finished Grade: Copper.
 - 3.3. Bonding Jumpers: Braided copper tape, 1 in. (25 mm) wide, woven of No. 30 AWG bare copper wire, terminated with copper ferrules.
 - 4. Connectors and Ground Rods: Listed in UL 467.
 - 4.1. Connectors for Below-Grade Use: Exothermic welded type.
 - 4.2. Ground Rods: Copper-clad steel.
 - Size: 5/8 in. by 96 in. (16 mm by 2400 mm).
- B. Protection at Crossings of Overhead Electrical Power Lines: Ground fence at location of crossing and at a maximum distance of 150 ft. (45 m) on each side of crossing.
- C. Fences Enclosing Electrical Power Distribution Equipment: Ground as required by IEEE C2, unless otherwise indicated.
- D. Grounding Method: At each grounding location, drive a ground rod vertically until the top is 6 in. (150 mm) below finished grade. Connect rod to fence with No. 6 AWG conductor. Connect conductor to each fence component at the grounding location.
- E. Bonding Method for Gates: Connect bonding jumper between gate post and gate frame.
- F. Connections: Make connections so possibility of galvanic action or electrolysis is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.
 - 1. Use electroplated or hot-tin-coated materials to ensure high conductivity to make contact points closer in order of galvanic series.
 - 2. Make connections with clean, bare metal at points of contact.
 - 3. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
 - 4. Make aluminum-to-galvanized-steel connections with tin-plated copper jumpers and mechanical clamps.
 - 5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.
- G. Bonding to Lightning Protection System: If fence terminates at lightning-protected building or structure, ground the fence and bond the fence grounding conductor to lightning protection down conductor or lightning protection grounding conductor complying with NFPA 780.

3.010. FIELD QUALITY CONTROL- GROUNDING

(Indicative only. Consult local professional for proper design.)

- A. Ground-Resistance Testing Agency: [Owner will engage] [Engage] a qualified independent testing agency to perform field quality-control testing.
- B. Ground-Resistance Tests: Subject completed grounding system to a megger test at each grounding location. Measure ground resistance not less than two full days after last trace of precipitation, without soil having been moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance. Perform tests by two-point method according to IEEE 81. Desired Maximum Grounding Resistance Value: 25 ohms. Excessive Ground Resistance: If resistance to ground exceeds desired value, notify Architect promptly. Include recommendations to reduce ground resistance and proposal to accomplish recommended work.
- C. Report: Prepare test reports, certified by testing agency, of ground resistance at each test location. Include observations of weather and other phenomena that may affect test results.

3.011. ADJUSTING (For gate operator only.)

- A. Gate: Adjust gate to operate smoothly, easily, and quietly, free from binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.
- B. Automatic Gate Operator: Energize circuits to electrical equipment and devices. Adjust operators, controls, safety devices, [alarms,] and limit switches.
 - 1. Electrohydraulic Operator: Purge operating system, adjust pressure and fluid levels, and check for leaks.
 - 2. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation. Test controls [, alarms,] and safeties. Remove damaged and malfunctioning units, replace with new units, and retest.
- C. Lubricate hardware [, gate operator,] and other moving parts.

3.012. DEMONSTRATION (For gate operator only.)

- A. Engage a factory-authorized service representative to train Owner's personnel to adjust, operate, and maintain gates.
 - 1. Test and adjust [operators,] [controls,] [alarms,] [safety devices,] hardware, and other operable components. Replace damaged or malfunctioning operable components.
 - 2. Train Owner's personnel on procedures and schedules for starting and stopping, troubleshooting, servicing, and maintaining equipment and schedules.
 - 3. Review data in maintenance manuals. Refer to Division 1 Section "Contract Closeout." and/ or Section "Operation and Maintenance Data."
 - 4. Schedule training with Owner (, through Architect,) with at least seven days' advance notice. END OF SECTION 02821

3.013. MAINTENANCE

- A. Inspection
 - 1. A thorough visual inspection shall be done annually.
 - 2. This inspection must include overall verification of physical condition.
- B. Moveable parts shall be adjusted, if needed, every 5 years.
- C. In areas of extreme winter conditions, entire installation must be free of excessive ice and snow accumulation.

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION **Section 700 –** **Grassing** **(Seeding and Sodding)**

700.1 General Description

This work includes preparing the ground, furnishing, planting, seeding, hydroseeding, fertilizing, sodding, and mulching disturbed areas within the project limits as shown on the Plans.

700.1.1 Definitions

General Provisions 101 through 150.

700.1.2 Related References

A. Standard Specifications

Section 160—Reclamation of Material Pits and Waste Areas

Section 163—Miscellaneous Erosion Control Items

Special Provision Section 708 – Plant Topsoil

Section 718—Wood Fiber

Section 822—Emulsified Asphalt

Section 882—Lime

Section 890—Seed and Sod

Section 891 Fertilizers

Section 893—Miscellaneous Planting Materials

Section 895—Polyacrylamide

B. Referenced Documents

QPL 33

QPL 84

700.1.3 Submittals

Submit manufacturer's product expiration date along with written instructions to ensure proper application, safety, storage, and handling of Polyacrylamide products used in The Work.

Product Data: For each type of product indicated in the landscape plans.

Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture stating the botanical and common name and percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.

Product Certificates: For existing surface soil and imported topsoil.

1. Results of analysis of topsoil indicating required nutrient and lime application rates.

Quality Assurance

Installer's Qualifications: A qualified landscape installer whose work has resulted in successful law / sod and native grass and wildflower seed mix establishment. Installer field supervision is required to maintain an experienced staff when planting.

700.2 Materials

Use materials that meet the requirements of the following Specifications:

Material	Section
Wood Fiber Mulch	718.2
Agricultural Lime	882.2.01
Seed	890.2.01
Sod	890.2.02
Fertilizer	891.2.01
Plant Topsoil	893.2.01
Mulch	893.2.02
Inoculants	893.2.04
Tackifiers	QPL 33
Anionic Polyacrylamide	QPL 84 & Section 895

A. Seeds

Whenever seeds are specified by their common names, use the strains indicated by their botanical names.

B. Water

Obtain the water for grassing from an approved source. Use water free of harmful chemicals, acids, alkalis, and other substances that may harm plant growth or emit odors. Do not use salt or brackish water.

C. Agricultural Lime

Agricultural lime rates will be based on a laboratory soil test report. The Contractor is responsible for ensuring the tests are performed by an approved laboratory. Provide a copy of test results to the Engineer. Refer to Section 882 Lime and GSP 18 of the Sampling and Testing Inspection manual for additional information on rates, use, handling and sampling procedures.

D. Fertilizer Mixed Grade

Fertilizer analysis and rates will be based on a laboratory soil test report. The Contractor is responsible for ensuring the tests are performed by an approved laboratory. Provide a copy of test results to the Engineer. Refer to Section 891 Fertilizer and GSP 18 of the Sampling and Testing Inspection manual for additional information on rates, use, handling and sampling procedures.

E. Mulch

Use straw or hay mulch according to [Subsection 700.3.05.G](#).

Use wood fiber mulch in hydroseeding according to [Subsection 700.3.05.F.1](#).

700.2.01 Delivery, Storage, and Handling

General Provisions 101 through 150.

700.3 Construction Requirements

700.3.1 Personnel

General Provisions 101 through 150.

700.3.2 Equipment

Use grassing equipment able to produce the required results.

Never allow the grading (height of cut) to exceed the grassing equipment's operating range.

A. Mulch Material Equipment

Use mulching equipment that uniformly cuts the specified materials into the soil to the required control depth.

B. Hydroseeding Equipment

For hydroseeding equipment, see [Subsection 700.3.05.F](#).

700.3.3 Preparation

General Provisions 101 through 150.

700.3.4 Fabrication

General Provisions 101 through 150.

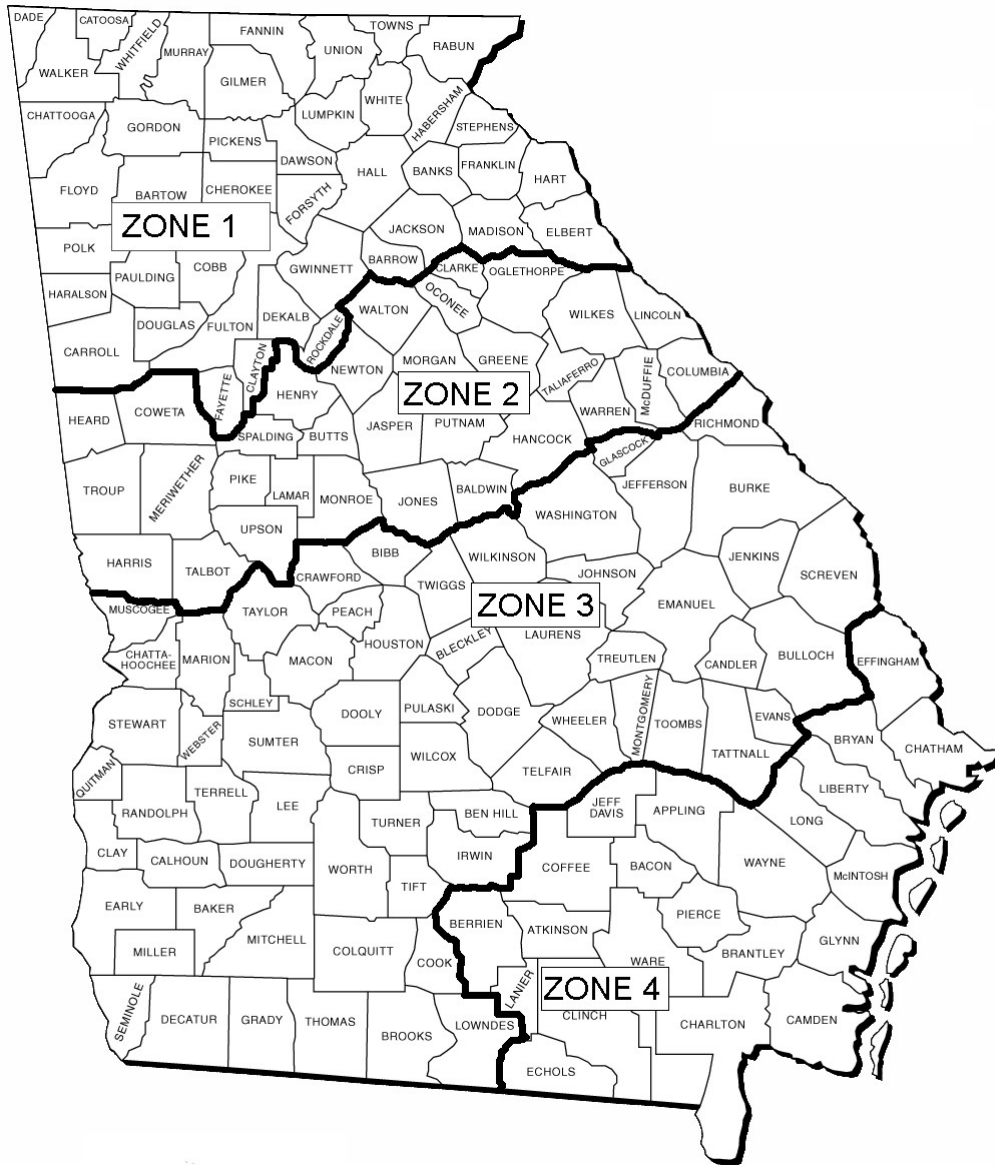
700.3.5 Construction

Follow the planting zones, planting dates, types of seed, seed mixtures, and application rates described throughout this Section. The Engineer has the authority to alter the planting dates as set forth by a period of 2 weeks. This 2-week period may be applied to either the beginning of the specified planting and/or to the end of the end of the specified planting season.

In general:

- Obtain the Engineer's approval before changing the groundcover type.
- Do not use annual rye grass seeds with permanent grassing.
- Follow the planting zones indicated on the [Georgia State Planting Zone Map, below](#).
- Sod may only be installed when not dormant, weather permitting.
- For permanent grassing, apply the combined amounts of all seeds for each time period within each planting zone and roadway location listed in the [Seeding Table](#), below. Do not exceed the amounts of specified seed.

PLANTING ZONE MAP



NON-NATIVE GRASS SEEDING TABLE 1

(Temporary and Permanent Seed Types for Shoulders, Medians and Slopes 3:1 or Flatter)

USE ONLY IF DIRECTED BY ENGINEER / LANDSCAPE ARCHITECT

Common Name	Botanical Name	Class/Type	Rate /Acr	Planting Zone	Planting Dates
Common Bermuda Grass (Hulled)	<i>Cynodon dactylon</i>	Required Permanent Grass	10 (11)	1	April 16 – August 31
Common Bermuda Grass (Un-hulled)			10 (11)		
Common Bermuda Grass (Hulled)	<i>Cynodon dactylon</i>	Required Permanent Grass	10 (11)	2,3,4	April 1 – October 15
Common Bermuda Grass (Un-hulled)			10 (11)		
Bahaia Grass	<i>Paspalum motatum</i>		10 (11)		
Rye Grass, Millet, Cereal Grass (Oats)	<i>Lolium penne</i> ssp. <i>Multiflorum</i> , <i>Echinochloa cursgalli</i> , <i>Avena sativa</i>	Temporary Grass	50 (56)	1	September 1- April 15
Rye Grass, Millet, Cereal Grass (Oats)	<i>Lolium penne</i> ssp. <i>Multiflorum</i> , <i>Echinochloa cursgalli</i> , <i>Avena sativa</i>	Temporary Grass	50 (56)	2,3,4	October 16- March 31

NON-NATIVE SEEDING TABLE 2

(Temporary and Permanent Seed Types

for back slopes, fill slopes and areas which will not be
subject to frequent mowing, slopes steeper than 3:1)

USE ONLY IF DIRECTED BY ENGINEER / LANDSCAPE ARCHITECT

Common Name	Botanical Name	Class/Type	Rate/Acre	Planting Zone	Planting Dates
Interstate Lespedeza	<i>Lespedeza sericea</i>	Permanent Grass	50(56)	1,2	March 1 – August 31
Weeping Lovegrass	<i>Eragrostis curvula</i>	Temporary Grass	10(11)		
Interstate Lespedeza	<i>Lespedeza sericea</i>	Permanent Grass	75(84)	1,2	September 1- February 28
Tall Fescue	<i>Festuca arundinacea</i>	Temporary Grass	50(56)		
Interstate Lespedeza	<i>Lespedeza sericea</i>	Permanent Grass	50(56)	3,4	April 1 – October 31
Weeping Love Grass	<i>Eragrostis curvula</i>	Temporary Grass	10(11)		
Interstate Lespedeza	<i>Lespedeza sericea</i>	Permanent Grass	50(56)	3,4	November 1 – March 31
Weeping Love Grass	<i>Eragrostis curvula</i>	Temporary Grass	10(11)		

**NATIVE GRASS SEEDING
(RIPARIAN BUFFER MIX)**

For Non-mowable Slopes or Areas Designated as Permanent Riparian Buffer Seed Mix.

Plant native seed mixes on back slopes, fill slopes and areas which will not be subject to frequent mowing (slopes steeper than 3:1) or as shown on the landscape plans.

A. Riparian Buffer Mix

Manufacturer: Ernst Conservation Seeds
8884 Mercer Pike
Meadville, PA 16335
Website: Ernstseed.com Phone: (800) 873-3321

Use seed mix number: **ERNMX-178**

See plan sheets/plant lists for detailed native grass seed mix/ riparian buffer seed mix locations. Install per manufacturer's recommendations.

TABLE 5: TEMPORARY GRASS - SPECIES, SEEDING RATES AND PLANTING DATES

Species	Rates per 1000 sq. ft.	Rates per Acre	Planting Date By Zone		
			1 & 2	2	3 & 4
Rye (Grain)	3.9 lbs	168 lbs	8/1 - 11/30	8/15 - 12/1	9/1 - 2/28
Ryegrass	0.9 lbs	40 lbs	8/1 - 11/30	9/1 - 12/15	9/15 - 1/1
Rye & Annual Lespedeza	0.6 lbs 0.6 lbs	28 lbs 24 lbs	3/1 - 4/1	2/1 - 3/1	2/1 - 3/1
Weeping Lovegrass	0.1 lbs	4 lbs	3/15 - 6/15	3/15 - 7/15	3/15 - 7/15
Sudangrass	1.0 lbs	60 lbs	4/1 - 8/31	4/1 - 8/31	3/15 - 8/1
Browntop Millet	1.1 lbs	50 lbs	4/1 - 6/30	4/1 - 7/15	4/1 - 7/15
Wheat	3.9 lbs	168 lbs	9/1 - 12/31	9/1 - 12/31	9/15 - 1/31

When stage construction or other conditions prevent completing a roadway section continuously, apply temporary grassing to control erosion. Temporary grassing is used to stabilize disturbed areas for more than sixty (60) calendar days. Temporary grass may be applied any time of the year, utilizing the appropriate seed species and application rate as shown in the chart above. Apply mulch to areas planted in temporary grass at the rate of ¾ inch to 1.5 inches. Do not place slope mats on areas planted in temporary grass.

A. Ground Preparation

Prepare the ground by plowing under any temporary grass areas and preparing the soil as follows:

1. Slopes 3:1 or Flatter

On slopes 3:1 or flatter, plow shoulders and embankment slopes to between 4 in and 6 in (100 mm and 150 mm) deep.

Plow front and back slopes in cuts to no less than 6 in (150 mm) deep. After plowing, thoroughly disk the area until pulverized to the plowed depth.

2. Slopes Steeper Than 3:1

Serrate slopes steeper than 3:1 according to Plan details when required.

On embankment slopes and cut slopes not requiring serration (sufficient as determined by the Engineer), prepare the ground to develop an adequate seed bed using any of the following methods as directed by the Engineer:

- Plow to a depth whatever depth is practicable. Use a spiked chain.
- Walk with a cleated track dozer. Scarify.
- Disking cut slopes and fill slopes is not required.

3. All Slopes

a. Obstructions

Remove boulders, stumps, large roots, large clods, and other objects that interfere with grassing or may slide into the ditch.

b. Topsoil

Spread topsoil stockpiled during grading evenly over cut and fill slopes after preparing the ground.

Push topsoil from the top over serrated slopes. Do not operate equipment on the face of completed serrated cuts.

4. Native Restoration Areas, Riparian Areas, Stream Restoration Areas, and Wetland and Stream Mitigation Areas.

For Permanent Grassing in native restoration areas, multitrophic native planting areas, riparian areas, stream restoration areas, and wetland and stream mitigation areas, provide the minimum ground preparation necessary to provide seed to soil contact. Riparian areas may also be seeded using the no-till method. The no-till method is defined by planting permanent grass seeds using a drill-type seeder over existing vegetation without plowing or tilling soil. Ensure that existing vegetation is less than 3 inches in height (this may be achieved by mowing or using a mechanical string trimmer).

B. Grassing Adjacent to Existing Lawns

When grassing areas adjacent to residential or commercial lawns, the Engineer shall change the plant material to match the type of grass growing on the adjacent lawn. The Contract Unit Price will not be modified for this substitution.

C. Temporary Grassing

Apply temporary grassing according to [Subsection 163.3.05.F](#). Determine lime requirements by a laboratory soil test. Refer to seeding Table 5 for species, amounts of seed and planting dates.

In March or April of the year following planting and as soon as the weather is suitable, replace all areas of temporary grass with permanent grass by plowing or overseeding using the no-till method. If the no-till method is used, ensure that temporary grass is less than 3 inches in height (this may be achieved by mowing). Additional mulch will be required only if the temporary grass does not provide adequate mulch to meet the requirements of [Subsection 700.3.05.G, "Mulching"](#).

Temporary grass, when required, will be paid for according to [Section 163](#).

Projects that consist of asphalt resurfacing with shoulder reconstruction and/or shoulder widening: Type II Wood Fiber Blanket is used to stabilize disturbed areas, no till seeding will be used when permanent grassing is applied and the areas will not be re-disturbed.

D. Applying Agricultural Lime and Fertilizer Mixed Grade

Apply and mix lime and fertilizer as follows:

1. Agricultural Lime

Uniformly spread agricultural lime on the ground at the approximate rate determined by the laboratory soil test.

- a. Agricultural Lime may be used as filler material in mixed grade fertilizer in lieu of inert material. The use of agricultural lime as filler material is to be shown on the fertilizer bag or invoice from the supplier. Do not deduct any amount of fertilizer when lime is used as filler.

2. Fertilizer Mixed Grade

Uniformly spread the fertilizer selected according to [Subsection 700.2.D](#) over the ground or by use of hydroseeding. For bid purposes base estimated quantities on an initial application of 400 lb/acre of 19-19-19.

3. Mixing

Before proceeding, uniformly work the lime and fertilizer into the top 4 in (100 mm) of soil using harrows, rotary tillers, or other equipment acceptable to the Engineer.

On cut slopes steeper than 3:1, other than serrated slopes, reduce the mixing depth to the max-

imum practical depth as determined by the Engineer.

Omit mixing on serrated slopes.

4. Native Restoration Areas, Multitropic Native Planting Areas, Riparian Areas, Stream Restoration Areas, and Wetland and Stream Mitigation Areas

Omit the application of lime and fertilizer within riparian areas.

E. Seeding

Prepare seed and sow as follows:

1. Inoculation of Seed

Inoculate each kind of leguminous seed separately with the appropriate commercial culture according to the manufacturer's instructions for the culture.

When hydroseeding, double the inoculation rate.

Protect inoculated seed from the sun and plant it the same day it is inoculated.

2. Sowing

Weather permitting, sow seed within 24 hours after preparing the seed bed and applying the fertilizer and lime.

Sow seed uniformly at the rates specified in the seeding tables. Use approved mechanical seed drills, rotary hand seeders, hydroseeding equipment, or other equipment to uniformly apply the seed. Do not distribute by hand.

To distribute the seeds evenly sow seed types separately, except for similarly sized and weighted seeds. They may be mixed and sown together.

Do not sow during windy weather, when the prepared surface is crusted, or when the ground is frozen, wet, or otherwise non-tillable.

3. Overseeding

Temporary grass areas that were prepared in accordance with [Subsection 700.3.05.A](#), may be overseeded using the no-till method. The no-till method is defined by planting permanent grass seeds using a drill-type seeder over existing temporary grass without plowing or tilling soil and in accordance with [Subsection 700.3.05.C](#).

4. Riparian Seed Mix shall be used when specified in the Plans. The seed, shall be applied as Permanent Grassing within those areas designated on the Plans. The kinds of seed, shall be used according to the appropriate Planting Dates given in the plans.

F. Hydroseeding

Hydroseeding may be used on any grassing area. Under this method, spread the seed, fertilizer, and wood fiber mulch in the form of a slurry. Seeds of all sizes may be mixed together. Apply hydroseeding as follows:

1. Use wood fiber mulch as a metering agent and seed bed regardless of which mulching method is chosen. Apply wood fiber mulch at approximately 500 lbs/acre (560 kg/ha).
2. Prepare the ground for hydroseeding as for conventional seeding in [Subsection 700.3.05.A](#).
3. Use specially designed equipment to mix and apply the slurry uniformly over the entire seeding area.
4. Agitate the slurry mixture during application.
5. Discharge slurry within one hour after being combined in the hydroseeder. Do not hydroseed when winds prevent an even application.
6. Closely follow the equipment manufacturer's directions unless the Engineer modifies the application methods.
7. Mulch the entire hydroseeded area according to [Subsection 700.3.05.F.1](#), above, and [Subsection 700.3.05.G](#), below.

Native Restoration Areas, Multitropic Native Planting Areas, Riparian Areas, Stream Restora-

tion Areas, and Wetland and Stream Mitigation Areas may be hydroseeded. When hydroseeding in these areas only use water, seed and wood fiber mulch.

G. Mulching

Except as noted in [Subsection 700.3.05.B](#) and [Subsection 700.3.05.C](#), apply mulch immediately after seeding areas as follows:

Areas with permanent grass seed and covered with slope mats or blankets will not require mulch.

Evenly apply straw or hay mulch between 3/4 in and 1-1/2 in (20 mm and 40 mm) deep, according to the texture and moisture content of the mulch material.

Mulch shall allow sunlight to penetrate and air to circulate as well as shade the ground, reduce erosion, and conserve soil moisture. If the type of mulch is not specified on the Plans or in the Proposal, use any of the following as specified.

1. Mulch with Tackifier

Apply mulch with tackifier regardless of whether using ground or hydroseeding equipment for seeding.

- a. Mulch uniformly applied manually or with special blower equipment designed for the purpose. When using a blower, thoroughly loosen baled material before feeding it into the machine so that it is broken up.
 - b. After distributing the mulch initially, redistribute it to bare or inadequately covered areas in clumps dense enough to prevent new grass from emerging (if required).
Do not apply mulch on windy days.
 - e. Apply enough tackifier to the mulch to hold it in place. Immediately replace mulch that blows away. If distributing the mulch by hand, immediately apply the
- tackifier uniformly over the mulched areas.

Tackifier: Use a tackifier listed in the Laboratory Qualified Products Manual and apply at the manufacturer's recommended rates.

2. Walked-in-Mulch

Apply walked-in-mulch on slopes ranging in steepness from 5:1 to 2:1 and treat as follows:

- a. Immediately walk it into the soil with a cleated track dozer. Make dozer passes vertically up and down the slope.
- b. Where walked-in-mulch is used, do not roll or cover the seeds as specified in [Subsection 700.3.05.E.3](#).

3. Apply only wheat straw mulch on Riparian Areas, Stream Restoration Areas, and Wetland and Stream Mitigation Areas after they have been seeded. The wheat straw mulch is to be applied with a maximum thickness of 1 inch.

H. Sod

Furnish and install sod in all areas shown on the Plans or designated by the Engineer.

1. Kinds of Sod

Use only one of the following varieties:

Bermuda Tif Tuf

Geo Zoysia

Sod shall be nursery-grown and be accompanied with a Georgia Department of Agriculture Live Plant License Certificate or Stamp. Sod shall consist of live, dense, well-rooted material free of weeds and insects as described by the Georgia Live Plant Act.

2. Type And Size Of Sod:

Furnish either big roll or block sod. Ensure that big roll sod is a minimum of 21 inches wide by 52 feet long. Minimum dimensions for block sod are 12 inches wide by 22 inches long.

Ensure all sod consists of a uniform soil thickness of not less than 1 inch.

3. Ground Preparation

Excavate the ground deep enough and prepare it according to [Subsection 700.3.05.A](#) to allow placing of sod. Spread soil, meeting the requirements of [Subsection 893.2.01](#), on prepared area to a depth of 4 inches.

4. Application of Lime and Fertilizer

Apply lime and fertilizer according to [Subsection 700.3.05.D](#) within 24 hours prior to installing sod.

5. Weather Limitation

Do not place sod on frozen ground or where snow may hinder establishment.

6. Install Sod

Install Sod as follows:

- Place sod by hand or by mechanical means so that joints are tightly abutted with no overlaps or gaps. Use soil to fill cracks between sod pieces, but do not smother the grass.
 - Stake sod placed in ditches or slopes steeper than 2:1 or any other areas where sod slipping can occur. Use wood stakes that are at least 8 in (200 mm) in length and not more than 1 in (25 mm) wide.
 - Drive the stakes flush with the top of the sod. Use a minimum of 8 stakes per square yard (meter) to hold sod in place.
- Once sod is placed and staked as necessary, tamp or roll it using adequate equipment to provide good contact with soil.
- Use caution to prevent tearing or displacement of sod during this process. Leave the finished surface of sodded areas smooth and uniform.

7. Watering Sod

After the sod has been placed and rolled or tamped, water it to promote satisfactory growth. Additional watering will be needed in the absence of rainfall and during the hot dry summer months. Water may be applied by Hydro Seeder, Water Truck or by other means approved by the Engineer.

8. Dormant Sod

Dormant sod can be installed. However, assume responsibility for all sod through establishment and until final acceptance.

9. Establishment

Sod will be inspected by the Engineer at the end of the first spring after installation and at the time of Final Inspection. Replace any sod that is not live and growing. Any cost for replacing any unacceptable sod will be at the Contractor's expense.

I. Application of Nitrogen

Apply nitrogen at approximately 50 lbs/acre (56 kg/ha) when specified by the Engineer after plants have grown to 2 inches (50 mm) in height.

One application is mandatory and must be applied before Final Acceptance.

Apply nitrogen with mechanical hand spreaders or other approved spreaders capable of uniformly covering the grassed areas. Do not apply nitrogen on windy days or when foliage is damp.

Do not apply nitrogen between October 15 and March 15 except in Zone 4.

1. Native Restoration Areas, Multitropic Native Planting Areas, Riparian Areas, Stream

Restoration Areas, and Wetland and Stream Mitigation Areas

Do not apply nitrogen to these areas.

J. Application of Polyacrylamide (PAM)

1. Prepare soil according to project Plans and Specifications prior to applying PAM.
2. Apply PAM according to manufacturer's recommendations and the requirements listed herein.
3. Apply Polyacrylamide (PAM) to all areas that receive permanent grassing.
4. Apply PAM (powder) before grassing or PAM (emulsion) to the hydroseeding operation.
5. Use only anionic PAM.
6. Ensure that the application method provides uniform coverage to the target and avoids drift to non-target areas including waters of the state.
7. Achieve > 80% reduction in soil loss as measured by a rainfall simulator test performed by a certified laboratory (1 hour storm duration, 3 inches (75 mm) rainfall per hour).
8. Ensure uniform coverage to the target area and minimize drift to non-target areas. Apply anionic PAM to all cut and fill slopes, permanently grassed or temporarily grassed, either prior to grassing or in conjunction with hydroseeding operations. Mulch will not be eliminated.
9. Use application rates in accordance with manufacturer's instructions.
10. Do not exceed 200 lbs/acre/year (224 kg/ha/year).
11. Do not include polyacrylamide when planting in Riparian Areas, Stream Restoration Areas, and Wetland and Stream Mitigation Areas

700.3.6 Quality Acceptance

The Engineer may require replanting of an area that shows unsatisfactory growth for any reason at any time.

Except as otherwise specified or permitted by the Engineer, prepare replanting areas according to the Specifications as if they were the initial planting areas. Use a soil test or the Engineer's guidance to determine the fertilizer type and application rate, then furnish and apply the fertilizer.

700.3.7 Contractor Warranty and Maintenance

A. Plant Establishment

Before Final Acceptance, provide plant establishment of the specified vegetation as follows:

1. Plant Establishment
Preserve, protect, water, reseed or replant, and perform other work as necessary to keep the grassed areas in satisfactory condition.
2. Watering
Water the areas during this period as necessary to promote maximum growth.
3. Mowing
Mow seeded areas of medians, shoulders, and front slopes at least every 6 months.
Avoid damaging desirable vegetation.
In addition, mow as necessary to prevent tall grass from obstructing signs, delineation, traffic movements, sight distance, or otherwise becoming a hazard to motorists.
Do not mow lespedezas or tall fescue until after the plants have gone to seed.
4. Do not mow riparian areas, stream restoration areas, or wetland and stream mitigation areas after planting.

B. Additional Fertilizer Mixed Grade

Apply fertilizer based on the initial soil test report at half the recommended rate each spring after initial plant establishment. For bid purposes apply 200 lbs/acre of 19-19-19. Continue annual applications until Final Acceptance. This additional fertilizer will be measured and paid for at the

Contract Unit Price for fertilizer mixed grade.

Do not apply additional fertilizer to Native Restoration Areas, Multitropic Native Planting Areas, Riparian Areas, Stream Restoration Areas, and Wetland and Stream Mitigation Areas.

C. Growth and Coverage

Provide satisfactory growth and coverage, ensuring that vegetation growth is satisfactory with no bare spots larger than 1 ft² (0.1 m²). Bare spots shall comprise no more than 1 percent of any given area. An exception is given for seed not expected to have germinated and shown growth at that time.

D. Permissible Modifications

When all Items of the work are ready for Final Acceptance except for newly planted repaired areas or other areas with insufficient grass, the Contractor may fill the eroded areas or treat bare areas with sod obtained, placed, and handled according to [Subsection 700.3.05.H](#).

Carefully maintain the line and grade established for shoulders, front slopes, medians, and other critical areas.

Sod as described above will not be paid for separately, but will be an acceptable substitute for the satisfactory growth and coverage required under this Specification. These areas treated with sod are measured for payment under the Item for which the sod is substituted.

700.4 Measurement

A. Permanent Grassing (Native Seed Mixes)

Permanent Grassing will be measured for payment by the acre (hectare).

B. Mulches

Straw or hay mulch applied to permanent grassing areas will be measured by the ton (megagram). Wood fiber mulch furnished by the Contractor for permanent grassing is not measured for separate payment.

C. Quantity of Sod

Sod is measured for payment by the number of square yards (meters) , surface measure, completed and accepted.

D. Water

Water furnished and applied to promote a satisfactory growth is not measured for payment.

E. Quantity of Lime and Fertilizer Mixed Grade

Lime and fertilizer are measured by the ton (megagram). Lime used as a filler in fertilizer is measured by the ton (megagram).

F. Quantity of Nitrogen Used for Permanent Grassing

Nitrogen is measured in pounds (kilograms) based on the weight of fertilizer used and its nitrogen content.

G. Replanting and Plant Establishments

No measurement for payment is made for any materials or work required under [Subsection 700.3.06](#) and [Subsection 700.3.07](#).

H. Temporary Grass

Temporary grass is measured for payment by the acre (hectare) according to [Section 163](#).

I. Seeded Native Restoration Areas, Multitropic Native Planting Areas, Riparian Areas, Stream Restoration Areas, and Wetland and Stream Mitigation Areas

Seeded Native Restoration Areas, Multitropic Native Planting Areas, Riparian areas, Stream Restoration area, and Wetland and Stream Mitigation areas will be measured by the acre (hectare). and included under the pay item "Native Restoration and Riparian Seeding".

700.4.01 Limits

General Provisions 101 through 150.

700.5 Payment

As grassing and planting progress, the Contractor will receive full measurement and payment on regular monthly estimates provided the work complies with the Specifications.

A. Permanent Grassing (Native Seed Mixes)

Permanent grassing will be paid for at the Contract Price per acre (hectare), complete and in place. Payment is full compensation for preparing the ground, seeding, wood fiber mulch, polyacrylamide, and providing plant establishment, soil tests and other incidentals.

B. Straw or Hay Mulch

Straw or hay mulch required for Permanent Grassing will be paid for according to [Section 163](#).

C. Fertilizer Mixed Grade

Fertilizer mixed grade will be paid for at the Contract Price per ton (megagram). Payment is full compensation for furnishing and applying the material.

D. Lime

Lime will be paid for at the Contract Price per ton (megagram). Lime used as filler in fertilizer will be paid for per ton (megagram). Payment is full compensation for furnishing and applying the material.

E. Nitrogen

Nitrogen will be paid for at the Contract Price per pound (kilogram) of nitrogen content. Payment is full compensation for furnishing and applying the material.

F. Sod

Sod will be paid by the square yard (meter) in accordance with the following schedule of payments. Payment is full compensation for ground preparation, including addition of topsoil, furnishing and installing live sod, and for Plant Establishment.

1. 70% of the Contract Price per square yard will be paid at the satisfactory completion of the installation.
2. 20% of the Contract Price will be paid upon satisfactory review of sod which is healthy, weed free and viable at the inspection made at the end of the first spring after installation..
3. 10% of the contract price will be paid upon satisfactory review of sod that is healthy, weed free and viable at the Final Acceptance.

G. Temporary Grass

Temporary Grass will be paid for under [Section 163](#).

H. Seeded Native Restoration Areas, Multitropic Native Planting Areas, Riparian Areas, Stream Restoration Areas, and Wetland and Stream Mitigation Areas

Seeded Native Restoration Areas, Multitropic Native Planting Areas, Riparian areas, Stream Restoration area, and Wetland and Stream Mitigation areas will be paid for at the Contract Price per

acre (hectare), complete and in place. Payment is full compensation for preparing the ground, seeding, and providing plant establishment and other incidentals. and included under the pay item "Native Restoration and Riparian Seeding".

Payment will be made under:

Item No. 700	Permanent grassing	Per acre (hectare)
Item No. 700	Agricultural lime	Per ton (megagram)
Item No. 700	Fertilizer mixed grade	Per ton (megagram)
Item No. 700	Fertilizer nitrogen content	Per pound (kilogram)
Item No. 700	Sod	Per square yard (meter)
Item No. 700	Native Restoration and Riparian Seeding	Per acre (hectare)

700.5.01 Adjustments

General Provisions 101 through 150.

END OF SECTION

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION Section 702 –0000 Vine, Shrub and Tree Planting

702.1 General Description

- A. This work includes furnishing and planting vines, shrubs, trees and plants, and Landscape Maintenance Bond requirements.
- B. Related Work: Drawings and general provisions of the contract, including General Conditions and Standard Specification sections apply to this section.

702.1.1 Definitions

General Provisions 101 through 150.

702.1.2 Related References

C. Standard Specifications

Section 108—Prosecution and Progress

Section 214—Mitigation Site Construction

Section 700—Grassing

Section 708—Plant Topsoil

Section 882—Lime

Section 891—Fertilizers

Section 893—Miscellaneous Planting Materials

D. Referenced Documents

Standardized Plant Names

ANSI A300 Part 1 Pruning Standards

ANSI Z60.1 American Standards for Nursery Stock

702.1.3 Submittals

A. Certificates of Inspection

Submit certificates of inspection with the invoice for each shipment of plants as required by law for transportation.

File certificates with the Engineer before the material is accepted. Plants may be rejected at the site regardless of Federal or State government inspections at the place of growth.

B. Substitutions

When both primary and alternate plants are specified, use the alternate only after providing written proof that the primary plants specified are not available. In this case a Supplemental Agreement is not required to use the alternate plants.

When a primary or an alternate plant cannot be furnished, provide the Engineer written proof that neither is available. A Supplemental Agreement is required for substitute plants in this case.

Use approved substitute plants, as designated by the Engineer, equal in value to specified plants. Request substitutions at least thirty (30) days before the end of the planting season in the area.

C. Contractor Submittal of Landscape Nursery Material

The Contractor shall furnish field-grown trees complying with ANSI Z60.1, with healthy root systems developed by root pruning and transplanting. Provide well-shaped, fully branched, healthy, vigorous stock free of disease, insects, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement. Provide written verification and photos of ten representative trees from the supplying nursery for review with the submittal. Provide a photograph of a sample tree root system with the submittal.

1. Furnish trees with the following characteristics:

Root System Development:

- a. 100% mechanically root pruned with a vibrating blade during the first three years of the tree's life.
- b. Trees shall have been field grown in heavy clay soil and irrigated with drip irrigation.
- c. Trunk flare shall be visible above ground from the nursery.

Canopy Development

- a. Strong central leader to the top of the canopy. The tip of the leader on the main trunk must be intact and its terminal bud must be the highest part of the tree.
- b. No branch shall have a diameter greater than 2/3 of the trunk diameter measured directly above the branch crotch. The tree crown must be structurally uniform. Branches shall be evenly distributed around the trunk. The crown shall be full of foliage which is evenly distributed around the tree.

2. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of rootball, which shall begin at root flare according to ANSI Z60.1.
3. Provide photos of tree root system meeting the requirements above 7 days prior to bid date for landscape architect's approval. Provide signed statement from grower describing root-pruning history & include grower name, contact, address, and phone number.
4. Landscape contractor shall submit confirmed order and documentation to landscape architect for trees within 15 business days of the bid award of the general contractor.

702.2 Materials

Ensure that materials meet the requirements of the following Specifications:

Material	Section
Water	700.2.B
Agricultural Lime	882.2.01
Fertilizers	891.2.01
Plant Topsoil	893.2.01
Landscape Mulch	893.2.02
Vines, Shrubs, Trees, and Miscellaneous	893.2.03
Tree Paint	893.2.06
Prepared Plant Topsoil	893.2.07
Stakes	893.2.08
Organic Soil Additives	893.2.09

A. Plant Specifications

Furnish plants according to the plant name and Specifications included on the plan sheets.

1. Plant Names

Ensure that the botanical and common names of plants specified conform to the most current edition of Standardized Plant Names, as adopted by the American Joint Committee on Horticultural Nomenclature.

2. Plants should be clearly labeled at the nursery. Labels should remain on the plants until inspected by the engineer.

3. Grades

Ensure that plants meet the grade requirements of the most current American Nursery and Landscape Association ANSI Z60.1 and any other requirements.

Caliper used for establishing plant grades or trunk sizes is measured according to the American Nursery and Landscape Association ANSI Z60.1. Plant trees with straight stems and symmetrical branches according to their natural growth. Trees with broken or damaged terminal or main stems will be rejected. There shall be a single dominant leader to the top of the all large canopy shade trees. There can be a double leader in the top 10% of the tree height.

Trees should be rooting into the root ball so that soil or media remains intact and trunk and root ball move as one when lifted, but not root bound. The trunk should bend when gently pushed and should not be loose so it pivots at or below the soil line.

There shall be no roots greater than 1/10 diameter of the trunk circling more than one-third the way around in the top half of the root ball. Roots larger than this may be cut provided they are smaller than one-third the trunk diameter.

The leaf-bearing crown should be full and uniform. Leaves should show no evidence of chlorosis, necrosis, disease or insect infestation.

B. Bare root seedlings

Use nursery-grown bare root seedlings which are a minimum of three (3) feet (1 meter) in height above the ground with a 1/4 inch (6.35mm) caliper, and a minimum primary root length of five inches (5) unless specified differently on the plan drawings.

Use approved substitute plants, as designated by the Engineer, equal in value to specified plants. Request substitutions at least 30 calendar days before the end of the planting season in the area. Wet swale bare root *Juncus effuses* shall be fresh divisions with a full, dense root base.

C. Nursery Plants

Unless otherwise specified, use plants stock-grown in a licensed nursery under intensive care and cultivation for at least one year. The largest branches of shade trees should be spaced at least 6 inches apart. The branch system shall be normally developed and free of disease, injurious insects, disfiguring knots, sun-scald, injuries, bark abrasions, dead or dry wood, broken terminal growth, or other disfigurements. Stems should show no evidence of die-back. Ensure that proper certificates of inspection and a complete list of the nursery growers accompany nursery grown plants. See Subsection 893.2.03.

D. Plant Topsoil

Plant topsoil mix shall contain topsoil defined within the Section 893. Organic soil additives shall not exceed 50% of the mixture. All organic soil additives shall be fully composted. Contractor shall submit samples of the proposed soil mix for approval. See section 893.

E. Approval and Selection of Materials and Work

Select materials and execute operations required under the Specifications and drawings with the approval of the Engineer. Remove rejected materials from the site promptly.

702.2.01 Delivery, Storage, and Handling

A. Bare-Rooted Plants

Protect bare root plants from drying out until planted. Uncovered roots without moisture-loss gel coating shall be exposed to air no longer than 15 minutes.

B. Balled and Burlapped Plants (B&B)

1. Burlap shall be a natural biodegradable material. Do not use synthetic burlap.
2. Replace plants rejected because of broken or loose balls, or balls of less diameter than that specified.
3. Protect the roots of balled and burlapped plants from moisture loss, unless they are planted immediately after they are delivered.
4. Plants shall be harvested with the ball of earth in which they are growing intact.

C. Container-Grown Plants

Keep container-grown plants moist but well drained until planted. Handle plants by the container or soil ball and not by the top growth.

D. Heeled-in Plants

Properly maintain heeled-in plants until they are planted. Do not allow plants to remain heeled-in over the summer or for over 30 days without the Engineer's consent.

E. Injury Prevention

Injured plants will be rejected. Protect tops of shrubs and trees while in transit to prevent windburn.

702.3 Construction Requirements

702.3.1 Personnel

General Provisions 101 through 150.

702.3.2 Equipment

General Provisions 101 through 150.

702.3.3 Preparation

A. Inspect Plant Material before Digging

The Engineer will inspect trees or plants from the bidder's source for acceptability and conformity to specification requirements for approval by the Engineer. When rejecting the trees or plants, the Engineer reserves the right to pursue and examine other sources of plants to find acceptable specimens. This change will not constitute an increase in cost to the State.

B. Clear and Grub

Clear and grub the planting area before planting or beginning to prepare the plant bed, unless noted differently on the plans. See Section 201.

C. Prepare Plant Bed

Prepare for planting as follows:

1. Planting Limits

Stake planting limits according to Plan details and the Engineer. Have the Engineer approve the method of plant identification before planting.

For median plantings, keep any woody plant a minimum of 3 feet (1m) from the edge of the plant bed to avoid vegetative growth into the roadway.

For stream buffers identified as "Stream Buffer" or "wet swales", on plans, the plant species shall be planted in a random, intermixed manner throughout the entire planting area. At the edges of the planting zone, keep new plants a minimum of 8 feet (2.4m) from existing trees or permanent structures.

2. Applications of Soil Additives
 - a. Apply fertilizer and lime to the plant bed according to the soil test report.
 - b. Spread an organic soil additive, (See Subsection 893.2.09), evenly throughout the designated area to at least 2 in (50 mm) deep. Thoroughly dig it into the soil to at least 6 in (150 mm) deep using a rotary hoe type tiller or other equipment that evenly mixes the soil, lime, fertilizer, and organic soil additive.
 - c. Till the area until the surface is smooth and free of weeds, roots, rocks, and other debris, to the satisfaction of the Engineer.
 - d. If the planting area lies within a multitrophic native planting area, stream buffer, wetland, wet swale, or marsh the addition of fertilizer or lime is prohibited.

702.3.4 Fabrication

General Provisions 101 through 150.

702.3.5 Construction

A. Seasonal Limitations for Planting

For geographic seasonal limitations, refer to the Planting Zones Map found in Subsection 700.3.05. Plant in Zones 1 and 2 between October 15 and March 15. Plant in Zones 3 and 4 between November 1 and January 1.

B. Planting Operations

Plant using the method called for on the details and plan sheets. Before beginning planting of each area, have available the necessary materials including prepared plant topsoil (see Subsection 893.2.07), water, stakes, and mulch. Plants shall be installed as straight/upright as possible. Any plants found to be leaning or broken will not be accepted or paid for by the engineer.

When seasonal limitations and weather conditions permit, continuously water, mulch, guy, provide tree guards, and stake as indicated on the plans and details until completing the last operation.

After completing planting, provide a method for retaining water adjacent to the plant according to the details shown on the Plans or as directed by the Engineer.

Protect marsh restoration areas from vehicles and machinery. Typical protective barriers are not to be used in tidal areas. Stakes that remain secure and are taller than the highest tide, flagged with highly visible flagging tape, are required to mark the area to be protected and off-limits for vehicles and machinery.

1. Planting By the Pit Method

a. Placing Bare-Rooted Plants

Plant bare-rooted plants delivered to the pit area. Protect roots from drying out until placing them in the pit.

1. Center plants in pits and spread roots as they originally grew.
2. Cover and prepare the topsoil according to details shown on the Plans.

b. Placing Balled and Burlapped Plants

Immediately plant these plants after they are delivered to the pit site.

1. The pit diameter shall be a minimum of 3 times the diameter of the rootball. Center the ball in the prepared pit, leaving the top of the ball 1 in (25 mm) above the top of the ground for settlement.
2. Cut away and remove the top 1/3 of burlap from the rootball. Cut all ropes and twine, pull the nails, and drop the remaining burlap to the bottom of the hole. Cut away and remove all wire from the root ball.
3. Partially fill the pit with prepared plant topsoil and compact the soil enough to hold the ball firmly. Add mycorrhizal inoculant to plant topsoil if specified in plans.
4. Equipment: Whenever possible a telehandler with side-tilt carriage forks (brands such as LULL or JLG) machine rated to handle weights of root balls and trees

should be used to set root balls in planting pits. Forks should always be carefully positioned above root ball to lift root ball by strapping on top of the root ball with four pick-up points for even weight distribution. Prior to setting root ball in planting pit, forks should be adjusted so that tree is plumb. Place root ball at a level where trunk flare will be 1 to 2" above surrounding finished grade after settling.

5. Backfill / Water: Backfill and tamp in 6" lifts until ½ complete. Saturate the planting hole with water. After ½ backfill, watering, and the tree is plumb, then add backfill to just below the top horizontal ring of the wire basket, completely saturate planting hole. Adjust root ball (if necessary) by adjusting forks to make tree straight and plumb and at proper depth. Do not remove forks until tree is straight and plumb, backfill is settled, and root ball is stable.
6. Remove Forks: After above items have been completed and tree is straight and plumb with root ball stable and at proper depth, gently remove forks and also remove:
 - a. The synthetic strap
 - b. Any cardboard packaging,
 - c. The top portion of the wire basket down to and including the first horizontal ring,
 - d. The burlap from the top portion of the root ball.
7. Backfill / Water: Complete the backfill and thoroughly saturate with water, repeat this step if necessary to make absolutely certain that air pockets do not exist in the backfill.
8. When soil on top of root ball is distorted or not perpendicular to tree trunk: Even root balls with excellent root systems grown and harvested at proper depth can sometimes become distorted during shipping and handling.

Actions to take if soil on top of root ball has become distorted:

- A. If soil is bulging or distorted on the top surface of the root ball:
 - i. Very gently tamp the area of bulging or distorted soil as much as possible so that soil is perpendicular to trunk.
 - ii. If soil is still bulging or distorted, very gently (with a sharp shovel or spade) cut and remove remaining bulge.
- B. Root ball distortion can be minimized by:
 - i. Providing as much advance notice as possible so that select trees will be able to best manage soil moisture during harvest, loading, and shipping.
 - ii. Coordinating scheduling so that trees will not be shipped during significant rain.
 - iii. Following the previous handling planting and care instructions.

When a tree is handled, moved, adjusted, straightened, etc. more than the minimum steps covered in these instructions, the possibility of root ball distortion and other damage increases. Root balls that are moved when extremely wet are the most likely to become distorted or damaged.

9. Staking: Immediately after backfill has settled & the tree is straight & plumb, stake tree to provide stability until root system is thoroughly established in the backfill. Check staking as needed to make sure trunk damage does not occur. Check to confirm that tree and root ball are stable before removing staking.
10. Mulch: Mulch the area over the root ball to a depth no deeper than 1 ½" to 2". Keep all mulch away from the trunk flare.
11. Straightening: If for any reason trees need straightening, trees can be straightened by carefully digging out all backfill around the root ball, attaching seat belt strap to the wire basket and lifting. Never pull, push, or put pressure on the trunk (refer to actions B.3 – B.12 for information to complete this process). If tree roots are significantly established in the backfill, it is best for the health of the trees to wait until dormancy to straighten trees, since roots outside the original root ball will be cut.

c. **Placing Container-Grown Plants**

When the container is delivered to the pit site, split the container from top to bottom and carefully remove the plant.

1. The pit diameter shall be a minimum of 3 times the diameter of the rootball. Spread into the hole any major roots growing around the container or prune them to remove any circular growth.
2. Place the ball in the center of the prepared pit, leaving the top of the ball 1 in (25 mm) above the top of the ground for settlement.
3. Partially fill the pit with prepared plant topsoil and compact the soil enough to hold the ball firmly. Add mycorrhizal inoculant to plant topsoil if specified in plans.

d. **Completing Pit Plantings**

After placing pit plantings, water plants thoroughly the same day regardless of weather or soil moisture conditions.

1. After the water has soaked in, add prepared plant topsoil and compact firmly up to 2 in (50mm) below the adjacent ground.
2. Stop compacting when the compacted prepared topsoil is 2 in (50 mm) below the adjacent ground.
3. Fill the remainder of each pit with loose, prepared plant topsoil according to the details shown on the Plans.
4. Prepare the loose topsoil to retain water adjacent to the plant according to the Plans or as directed by the Engineer.

2. **Planting using a Dibble, Hoedad, or Reinforced Planting Shovel for Wet Swale and Bare Root Seedlings.** Planting shall only be done when there is adequate moisture in the ground and when the ground is not frozen.

Provide proper root positioning and contact with the soil, and eliminate all air pockets around roots. Roots of seedlings shall not be pinched or bent in a sideways or upturned direction.

Each tree, division, or seedling shall be inserted into the hole such that the root collar of the tree will be at ground level after backfilling is complete. Allowance for burying the root collar below ground level shall not exceed one-half inch in depth. In no case shall planting result in the root collar remaining above ground level. The soil back-filled around the root system shall be compacted sufficiently to support the plant. Mow or use a string trimmer to a height of 1 in (25 mm) in the area designated for restoration. Do not trim wet swales or retention basins where standing water is present.

Grass the area designated for restoration with a native restoration or riparian seed mix and apply wheat straw mulch to the area before planting seedlings.

Plant within 48 hours after mowing or string trimming the site.

3. **Restoration and enhancement of tidal marsh areas** are subject to possible wave energy, requiring the use of a plant anchor for each plant. See planting plan sheets and details for plant anchor and anchoring descriptions.

C. Landscape Mulching

1. **For Pit Plantings**

Follow these requirements when mulching for pit plantings:

- a. Where the distance between plants is 8 ft (2.4 m) or less, spread mulch throughout and 3 ft (900 mm) beyond the outermost plants. Where plants are more than 8 ft (2.4 m) apart, apply mulch in a circular fashion around each plant, forming a ring 5 ft (1.5 m) in the outside diameter.
- b. If plant pits are greater than 5 ft (1.5 m) in diameter, ensure that the mulch extends out to cover the berm as shown in the planting details on the Plans.

- c. Apply mulch within 3 days of planting at least 4 in (100 mm) in depth to obtain a compacted depth of at least 3 in (75 mm).
 - d. Compaction occurs naturally. Check compaction at least two months after spreading and exposing the mulch to the elements.
 - e. If the compacted depth is less than 3 in (75 mm), apply additional mulch to deficient areas within 1 month following notification.
 - f. Apply mulch to a uniform depth and remove lumps for a neat appearance. Tuck mulch neatly against all paving edges, drainage structures, and where planting beds meet grassed areas.
 - g. Leave a 1 in (25 mm) to 2 in (50 mm) ring of non-mulched area directly around all tree trunks.
 - h. Do not mulch with Cypress Mulch.
2. For Plantings using a Dibble, Hoedad, or Reinforced Shovel
Apply landscape mulch according to Subsection 702.3.05.C.1 with the following exceptions:
- a. Apply mulch before planting.
 - b. Use only wheat straw mulch in restoration areas.
 - c. Ensure that the mulch coverage is open enough to allow seed germination to take place and dense enough to conserve moisture in the seed bed.
3. For Native Multitrophic or Stream Buffer Restoration Planting Areas, wheat straw shall be the only types of mulch used.
4. Do not mulch wet swale or retention ponds where standing water is present.

D. Wrapping

Do not wrap the trunks of tree unless specified in the plans. When wrapping is specified, tightly wrap the trunks of deciduous trees over 1.25 in (32 mm) in caliper. Wrap in strip burlap or waterproof crepe tree wrapping paper or other approved materials.

- 1. Begin wrapping at the ground and extend spirally up and beyond the first rosette of branches with an overlap of one half the width of the wrapping material.
- 2. Tie the wrapping material securely with binder twine spaced every 12 in (300 mm) for the full length of the wrapping. Wrap immediately after planting.

E. Staking and Guying

- 1. Do not use staking and guying unless specified in the plans or details.
- 2. Perimeter Staking
- 3. Place perimeter stakes 2 in x 2 in x 36 in (50 mm x 50 mm x 900 mm). Stake the perimeter of indicated regenerated areas within specified planting dates according to the Plans or as directed by the Engineer. Place as many stakes as necessary to keep trees and rootball straight, upright, and plumb.
- 4. Vine, Shrub, and Miscellaneous Plant Staking
- 5. Use stakes to identify isolated vines, shrubs, and miscellaneous plants outside of solid mulched beds according to Plan details.
- 6. Tree Staking and Guying
- 7. Stake trees using a system that will prevent trees from leaning or tilting and keep the root ball stable until the roots become anchored. The system should allow the top some movement and flexibility without damaging the tree. Nylon guying straps of accepted size and quality shall be used.
- 8. Replace at no additional expense to the Department, any staking and guying materials that break or loosen.

F. Pruning

1. Prune plants on the site before planting and after initial inspection by the Engineer as needed for the health of the plant. Never prune severely to get plants to meet Specifications.
 - a. Follow ANSI A300 Part 1 standards and use approved tools designed for pruning.
 - b. Lopping, topping, or shearing trees or shrubs is not permitted.
 - c. Prune back damaged, scarred, frayed, split, and skinned branches, limbs, and roots to live wood nearest to the next sound, outside lateral bud, branch, limb, or root.
 - d. Leave the terminal leaders or buds in trees intact.
 - e. Prune roots, when necessary, as directed by the Engineer.
 - f. Prune Crape Myrtles to maintain natural form only. Severely cutting back or stump pruning crape myrtles is not permitted. Remove sucker growth from Crape Myrtles.
 - g. Damaged, scarred, frayed, split and skinned branches, limbs and roots shall be pruned back to live wood nearest to the next viable outside lateral bud, branch, limb or root.

G. Watering

1. Apply water in a manner to prevent erosion. Water plants deeply and thoroughly at the time of planting. Water after applying fertilizer called for in Subsection 702.3.05.H and as necessary to maintain enough moisture to promote plant growth.
 - a. Apply enough water to wet the soil to a depth slightly below the roots. Direct the water to the ground around the plant, not the tops.
 - b. Do not allow plant foliage to dry out or plants to defoliate from lack of water. Remove plants in such condition from the site immediately. Apply supplemental watering to maintain vigorous growth and to keep plants moist and as directed by the Engineer.
 - c. Apply water once per week throughout the planting season in which the plants are installed. Follow Subsection 702.3.07.B and 702.3.07.C for shrub and tree watering requirements throughout the life of the project.
 - d. If required irrigation water shall be transported via watering truck and administered by hand watering.
 - e. The Contractor is responsible for monitoring all plant material vitality, soil moisture level, and climatic conditions as they pertain to watering. Maintain accurate rainfall measurements for Project until Final Inspection and until expiration of Landscape Maintenance Bond. The Contractor shall install and maintain a minimum of three (3) rain gauges spaced evenly along Project.

H. Spring Application of Fertilizer

1. Method and Rate of Application

Follow these requirements when applying fertilizer in the spring:

a. Trees

Apply a slow-release fertilizer according to soil test results. Assume 8-12-12 with a rate of 1 cup (0.25 L) per caliper inch of tree for bidding purposes.

b. Shrubs and vines

Fertilize shrubs according to soil test results with a slow release fertilizer by spreading fertilizer around the base of the plant and working it into the soil by hand. Assume 6-12-12 with a rate of 0.5 cup (0.12 L) per foot of shrub height for bidding purposes.

Bed Areas

Spread fertilizer on bed areas (defined by method of planting in Subsection 702.3.05.B), over the mulch according to soil test results. Assume 3 lbs/100ft² of 6-12-12 for bidding purposes. Thoroughly water in the plants.

c. Native Restoration or Stream Buffer Areas

The addition of fertilizer or lime is prohibited within the native restoration or stream buffer planting areas.

2. Time of Spring Fertilizer Application

Apply fertilizer in the spring in Zones 1 and 2 (with reference to the Planting Zones specified in Subsection 702.3.05.A) between April 1 and April 15. Apply between March 15 and April 1 for Zones 3 and 4. For late plantings, do not apply fertilizer less than 30 days after the plantings.

3. Additional Fertilizer

Approximately one month after the spring fertilizer is applied; the Engineer will inspect planted areas and determine if an additional application of fertilizer is needed for any plant or group of plants.

If the Engineer determines additional fertilizer is required, apply fertilizer according to soil test results between June 15 and July 15th.

I. Tree Guards for Stream Buffer Saplings

Each planted bare root, sapling-sized plant shall be fitted with a tree guard to protect the saplings from wildlife browsing. The tree guards shall be at least 36 inches tall, with appropriately sized wooden stakes or bamboo to securely support the tree guard [i.e., a 4-foot (1.2 meter) stake for a 36 inch (914.4 mm) guard]. Mesh tube-type tree guards are required.

Vexar tubes, or equivalent, are to be used. All tree guards shall be removed from the saplings at final inspection.

J. Restoration and Cleanup

Restore areas where existing grass has been damaged or scarred during planting operations at no expense to the Department. Restore the disturbed areas to their original conditions as directed by the Engineer. Clean up debris, spoil piles, and containers and leave the Project area clean.

Clean up and remove all debris, spoil piles, containers, water reservoirs, trash, etc. and leave the project area in an acceptable condition. Inspect all installed erosion control devices weekly and clean out or repair as required. Remove all erosion control devices at final acceptance unless otherwise instructed by the Engineer.

702.3.6 Quality Acceptance

Preserve the plants in a healthy growing condition and keep plants moist, particularly during drought conditions (no rain for any two week period). The acceptability of the plant material planted and maintained as specified will be determined at the end of an warranty and landscape maintenance bond period.

Plant all plants in one planting season unless otherwise approved by Engineer.

A. Final Inspection

The Department will make the final inspection of the plants during May, following any needed re-placements during the previous planting season. Assume responsibility for the plants until the Final Acceptance of the Project or a portion of the Project.

702.3.7 Contractor Warranty and Landscape Maintenance Bond Requirements

The Contractor guarantees and will replace, at no additional cost to the owner, 100% of the plants which, in the opinion of the landscape architect/ Owner representative, fail to maintain a healthy, vigorous condition for the entire (1) one-year warranty starting after final acceptance of the project. Landscape Maintenance Bond shall be for one-year starting after final acceptance of the project. The Landscape Maintenance Bond includes maintenance as outlined in this special provision. The Landscape Maintenance Bond also includes maintaining all sod, seeded areas, and wildflower areas, refer to Plans and Special Provision Section 700 – Grassing (Sodding and Seeding) and Special Provision Section 701 – Wildflower Seeding. Replacement plant material shall meet all specifications as listed in the drawings and on the plant list in regard to species, variety, color, and quality. Size of replacement plant material shall equal that of the plant which is being replaced and/or the size of existing adjacent like specimens.

The Contractor is responsible for “treating” problem plant material and shall outline immediate steps to correct problems or improve performance of the plant.

In the event that the performance of the landscape maintenance contractor should fail to satisfy the expectations and standards set forth in the maintenance specifications as interpreted by the owner and the landscape architect, the owner reserves the right to obtain others to perform such duties and/or not release the landscape maintenance bond.

Inspections: The owner, or the designated owner’s representative, will make periodic reviews of the entire site as related to visual aspects and the contractor’s performance. The contractor will, on the sole judgment of the designated representative, make repairs and adjustments as directed during the site visit.

Schedule: Prior to starting this contract the contractor will provide the owner with a detailed schedule of how he expects to accomplish this work/maintenance along with a statement of anticipated labor forces. The schedule is to include target dates for all cycle and periodic work, time estimates for task completion, staffing requirements, etc...

Project maintenance includes, but is not limited to, mowing, edging, watering, cultivating, weeding, pesticide and herbicide control, pruning, repairing, adjusting guys and stakes, and performing other work as ordered by the Engineer until final acceptance and for the landscape maintenance bond duration.

Promptly remove from the Project area dead plants or those that no longer conform to the requirements of Subsection 702.2.A.2.

Mow sod area of the Project up to a maximum of six times per calendar year. Do not mow native seed mix areas, restoration areas, wet swales, or riparian mitigation sites.

A. Leaning Trees

Straighten leaning trees as directed by the Engineer. Follow Staking and Guying requirements for replacements or repairs as per Subsection 702.3.05.E.

B. Shrub Maintenance

1. Pruning

Prune dead or diseased limbs to provide for plant health and appearance as directed by the Engineer.

2. No regular shrub pruning or maintenance is necessary, as the intent is for shrubs to grow together to form a mass or grouping. Prune or thin shrubs only by direction of landscape architect.

3. Landscape Mulching

Continuously maintain shrub and tree beds with a clean, freshly mulched appearance using the mulch originally specified. See Subsection 702.3.05.C. Do not mulch shrub and tree beds within riparian mitigation sites.

a. Apply a 2 in (50 mm) loose layer of specified mulch (top-dressing) on top of all areas, including tree pits, initially mulched, at the following times:

1. In August and April or as directed by the Engineer.

4. Applying Fertilizer

See Subsection 702.3.05.H.

5. Applying Pesticides

a. Inspect all planted or seeded vegetation for insects, grubs, mites, diseases, etc., once every two weeks. Apply insecticides, fungicides, and herbicides according to the manufacturer’s recommendations to effectively control or eradicate the problem.

b. Perform all pesticide applications under the direct supervision of a trained licensed commercial pesticide operator whose license includes subcategory 27 – Right of Way Pest Control. Carry the pesticide license/certification on the work site during applications. Carry all labeling associated with the chemical being applied at the work site.

c. Submit all product information data sheets and EPA approval numbers on all pesti-

- cides proposed to be used prior to application for approval.
 - d. Notify the Engineer a minimum of 48 hours prior to any and all pesticide applications.
 - e. Add a blue dye to all spray applications unless approved otherwise by the Engineer.
 - f. Monitor the weather and spray under proper weather conditions. Spraying shall not occur when the weather is greater than 10 miles per hour.
 - g. Wear the proper safety attire. Wear long sleeve shirts, long pants, gloves, and safety glasses. Wear or use any additional protective safety attire or gear as recommended by the product's manufacturer.
 - h. Repair any damage that is a result of mishandling or misuse of materials, at no expense to the Department, to the satisfaction of the Engineer.
 - i. For stream buffer and marsh restoration areas, pesticides are not to be used unless approved by the Department Ecology Manager.
6. Edging
- a. Edge all shrub pits, shrub beds, and tree pits once a month throughout the life of the project such that the vee-cut edging detail specified on the plans is maintained. Prevent grass and weeds from growing over or into the shrub beds and tree pits.
 - b. Use equipment specifically designed for edging. Line trimming equipment shall not be used.
7. Watering
- a. Check all planted material once a week throughout the contract for dryness by removing the mulch from their base and "sampling the soil" approximately 4 in (100mm) deep. Water if the soil is not moist.
 - b. Water all planted material if a drought (no rain for two weeks) occurs. Provide the water required to meet the watering requirements.
 - c. Water each plant thoroughly until the ground is saturated to a depth slightly below the root ball. Apply water in a manner to prevent erosion.
8. Weed Control
- Perform weed control throughout the project, a minimum of once every two weeks, in all areas within the project limits to maintain tree pits, shrub beds, sidewalks, curb and gutter, walkways, ditch paving, concrete medians, and other pavement weed free. Meet the following conditions:
- a. Perform weed control to prevent weeds from becoming established, setting seed, or from becoming visible in the planting beds.
 - b. Completely remove all undesirable plants (weeds) by hand pulling. Removal of weeds may be accomplished using herbicides if approved by the Engineer. However, the use of herbicides is prohibited in stream buffer areas unless approved by the Department Ecology Manager.
 - c. Apply an approved pre-emergent herbicide twice each year, once in the spring and once in the fall, throughout the contract. The use of pre-emergent herbicides is prohibited in stream buffer areas. Apply pre-emergent to all shrub beds and tree pits. Notify the Engineer 48 hours prior to spraying. Use a blue dye in all applications unless approved otherwise by the Engineer.
 - d. Eradicate all invasive exotic pest plants found within the project limits throughout the life of the project, including stream buffer and marsh areas. Volunteer, non-invasive plant material within stream buffer restoration areas is acceptable.
 - e. Dispose off site on a daily basis all weed, exotic plants, clippings, litter, and debris generated.
9. Policing
- Remove debris such as paper, broken limbs, bottles, cans, etc., a minimum of the first and third week of each month from all areas within the project limits while maintaining the site.
10. Mitigation Areas

Pruning, mulching, edging, and applying spring fertilizer are not required within wet swales, native restoration areas, stream buffers and regenerated forest areas.

C. Tree Maintenance

1. Watering
See Subsection 702.3.07.B.6
2. Landscape Mulch
See Subsection 702.3.07.B.2
3. Fertilizer
See Subsection 702.3.05.H.
4. Abnormal Conditions
Periodically (once every two weeks) observe trees and shrubs for abnormal conditions such as insects, borers, web worms, red spiders, etc., and immediately treat.
5. Sucker Growth
Remove sucker growth once a month. Sucker growth is the shoots that sprout out around the base of the tree trunk.
6. Pruning and Deadwood
Remove deadwood at least two times a year. Prune dead branches. Paint cuts, and wounds or scars with tree paint only when specified in the plans. Do not top Crape Myrtles. See Subsection 702.3.05.F.
7. Pesticide Control

NOTE: Apply pesticides as necessary to control harmful insects and diseases. Follow the manufacturer's instructions. See Subsection 702.3.07.B.4. NOTE: Use chemicals according to Federal, State and county directives on environmental control that carry an EPA approval number.

8. Weed Control
See Subsection 702.3.07.B
9. Staking and Guying
Remove all support guy wires, strapping and stakes from plants which have gone through one complete growing season.

702.4 Measurement

A. Plants

Plants of the name and size specified are measured for payment according to the number planted that are still living and viable and in an acceptable condition at the time of Final Acceptance. A viable plant must have a minimum of 75 percent of the leaf-bearing crown with healthy foliage.

B. Fertilizer

Spring application fertilizer applied to planted and regenerated areas will be the actual number of pounds (kilograms) placed and accepted. Fertilizer, lime, and plant topsoil used in prepared plant topsoil or plant bed preparation are not measured for separate payment. For stream buffer and marsh areas, the addition of fertilizer or lime is prohibited.

C. Perimeter Stakes

Perimeter stakes is not measured for payment unless such item is shown as a separate Pay Item in the Proposal.

D. Clearing and Grubbing

Clearing and grubbing is not measured for payment unless the Item is shown as a separate Pay Item in the Proposal.

E. Landscape Mulch

The quantity of landscape mulch and top-dressing measured for payment will be the actual number of square yards (meters) completed as specified and accepted. The presence of weeds or other growth, or foreign material, will be cause for rejection.

702.4.01 Limits

General Provisions 101 through 150.

702.5 Payment

A. Plants

Plants measured for payment will be paid for as follows:

1. After planting satisfactorily, the Department will pay 80 percent of the Contract Unit Price bid per each on the next estimate.
2. Until Final Acceptance, perform all required maintenance according to Subsection 702.3.07 when necessary or as ordered by the Engineer.

If the Contractor fails to properly maintain the landscaping, daily charges shall be assessed against any money due or that may become due the Contractor in accordance with the schedule of deductions shown in Subsection 108.08, but not less than \$150 per calendar day, and will continue until project maintenance is approved by the Engineer.

The charges are in addition to those specified for delay or failure in completing the Work within the specified time.

3. At Final Acceptance, the Department will pay the remaining 20 percent less the Full Contract Unit Price bid per each plant not accepted.

Payments are full compensation for furnishing, planting, replanting as required, pruning, staking, guying, soil conditioning, and preparing plant beds, including applying additives, digging plant pits, preparing plant topsoil and mulch, disposing of waste material, and maintaining the plants till final acceptance and till the end of the Landscape Maintenance Bond.

B. Fertilizer

All grades of fertilizer applied in the spring, measured as specified above, are paid for at the Contract Price per pound (kilogram) or per ton (megagram), whichever is indicated in the Proposal. Payment is full compensation for furnishing and applying and for watering regenerated areas.

For native restoration, stream buffer and marsh restoration areas, the addition of fertilizer or lime is prohibited.

C. Perimeter Stakes

Perimeter stakes will not be measured for payment. The cost will be included in the overall contract price.

D. Landscape Mulch

Landscape mulch measured for payment will be paid for as follows:

1. After mulching satisfactorily, the Department will pay 80% of the Contract Unit Price bid per square yard (meter) for the 1st landscape mulch application.
2. As directed by the engineer or a month before the final inspection (April or August), the contractor shall complete 2nd landscape mulch application (topdressing), the Department will pay 20% of the Contract Unit Price bid per square yard (meter). Such payment shall be full compensation for furnishing, installing, topdressing, and maintaining mulch as required.
3. Do not mulch marsh restoration areas.

4. Do not apply additional applications of mulch after the initial application in stream buffer restoration areas.

E. Plant Topsoil

Plant Topsoil measured for payment will be paid for as follows:

1. Plant topsoil, eligible for payment, will be paid for at the Contract Unit Price per cubic yard. Payment is full compensation for furnishing the material, removing objectionable matter from the material, loading and unloading, stockpiling and removing from the stockpile, hauling, spreading, preparing the ground, pulverizing, mixing, remising, and for all maintenance.

Payment will be made under:

Item No. 702	Plant Name and Size	Per each
Item No. 702	Fertilizer, Spring Application	Per ton (megagram)
Item No. 708	Plant Topsoil	Per cubic yard
Item No. 702	Landscape Mulch	Per square yard (meter)
Item No. 702	Spring Application Fertilizer	Per pound (kilogram)
Item No. 702	Perimeter Stakes	Per each
Item No. 702	Bare Root Seedling Planting	Per each

702.5.01 Adjustments

General Provisions 101 through 150.

END OF SECTION

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION

Section 708 – Plant Topsoil

708.1 General Description

This work includes furnishing and applying approved plant topsoil at the locations shown on the Plans or as directed by the Engineer and according to these Specifications.

708.1.1 Definitions

General Provisions 101 through 150.

708.1.2 Related References

A. Standard Specifications

Section 104—Scope of Work

Section 106—Control of Materials

Section 107—Legal Regulations and Responsibility to the Public

Section 893—Miscellaneous Planting Materials

B. Referenced Documents

General Provisions 101 through 150.

708.1.3 Submittals

A. Product Data: For each type of product.

1. Include recommendations for application and use.
2. Include test data substantiating that products comply with requirements.
3. Include sieve analysis for aggregate materials.
4. Material Certificates: For each type of imported soil, soil amendment and fertilizer before delivery to the site, according to the following:
 - a. Manufacturer's qualified testing agency's certified analysis of standard products.
 - b. Analysis of fertilizers, by a qualified testing agency, made according to AAPFCO methods for testing and labeling and according to AAPFCO's SUIP #25.
 - c. Analysis of nonstandard materials, by a qualified testing agency, made according to SSSA methods, where applicable.

B. Samples: For each bulk-supplied material, 1 gal. volume of each in sealed containers labeled with content, source, and date obtained. Each sample shall be typical of the lot of material to be furnished; provide an accurate representation of composition, color, and texture. Samples to be for imported material and on-site stockpiled soil. Soil samples must be approved by Landscape Architect prior to importing or spreading on-site material.

C. Informational Submittals:

1. Qualification Data: For each testing agency.
2. Preconstruction Test Reports: As specified in "Preconstruction Testing," article.
3. Field quality-control reports

708.1.4 Quality Assurance

Testing Agency Qualifications: An independent, state-operated, or university-operated laboratory; experienced in soil science, soil testing, and plant nutrition; with the experience and capability to conduct the testing indicated; and that specializes in types of tests to be performed.

708.1.5 Preconstruction Testing

- A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction soil analyses on existing on-site soil and imported soil.
 - 1. Notify Architect seven days in advance of the dates and times when laboratory samples will be taken.
- B. Preconstruction Soil Analyses: For each unamended soil type, perform testing on soil samples and furnish soil analysis and a written report containing soil-amendment and fertilizer recommendations by a qualified testing agency performing the testing according to "Soil-Sampling Requirements" and "Testing Requirements" articles.
 - 1. Have testing agency identify and label samples and test reports according to sample collection and labeling requirements.

708.1.6 Soil Sampling Requirements

- A. General: Extract soil samples according to requirements in this article.
- B. Sample Collection and Labeling: Have samples taken and labeled by Owner or state-certified, licensed, or registered soil scientist under the direction of the testing agency.
 - 1. Number and Location of Samples: Minimum of three representative soil samples from varied locations and as directed by architect for each soil to be used or amended for landscaping purposes.
 - 2. Procedures and Depth of Samples: According to USDA-NRCS's "Field Book for Describing and Sampling Soils."
 - 3. Division of Samples: Split each sample into two, equal parts. Send half to the testing agency and half to Owner for its records.
 - 4. Labeling: Label each sample with the date, location keyed to a site plan or other location system, visible soil condition, and sampling depth.

708.1.7 Testing Requirements

- A. General: Perform tests on soil samples according to requirements in this article.
- B. Physical Testing:
 - 1. Soil Texture: Soil-particle, size-distribution analysis by one of the following methods according to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods":
 - Sieving Method: Report sand-gradation percentages for very coarse, coarse, medium, fine, and very fine sand; and fragment-gradation (gravel) percentages for fine, medium, and coarse fragments; according to USDA sand and fragment sizes.
 - Hydrometer Method: Report percentages of sand, silt, and clay.
 - 2. Total Porosity: Calculate using particle density and bulk density according to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods."
 - 3. Water Retention: According to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods."

4. Saturated Hydraulic Conductivity: According to SSSA's "Methods of Soil Analysis - Part 1- Physical and Mineralogical Methods"; at 85% compaction according to ASTM D 698 (Standard Proctor).
- C. Chemical Testing:
1. CEC: Analysis by sodium saturation at pH 7 according to SSSA's "Methods of Soil Analysis - Part 3- Chemical Methods."
 2. Clay Mineralogy: Analysis and estimated percentage of expandable clay minerals using CEC by ammonium saturation at pH 7 according to SSSA's "Methods of Soil Analysis - Part 1- Physical and Mineralogical Methods."
 3. Metals Hazardous to Human Health: Test for presence and quantities of RCRA metals including aluminum, arsenic, barium, copper, cadmium, chromium, cobalt, lead, lithium, and vanadium. If RCRA metals are present, include recommendations for corrective action.
 4. Phytotoxicity: Test for plant-available concentrations of phytotoxic minerals including aluminum, arsenic, barium, cadmium, chlorides, chromium, cobalt, copper, lead, lithium, mercury, nickel, selenium, silver, sodium, strontium, tin, titanium, vanadium, and zinc.
- D. Fertility Testing: Soil-fertility analysis according to standard laboratory protocol of SSSA NAPT NCR-13 including the following:
1. Percentage of organic matter.
 2. CEC, calcium percent of CEC, and magnesium percent of CEC.
 3. Soil reaction (acidity/alkalinity pH value).
 4. Buffered acidity or alkalinity.
 5. Nitrogen ppm.
 6. Phosphorous ppm.
 7. Potassium ppm.
 8. Manganese ppm.
 9. Manganese-availability ppm.
 10. Zinc ppm.
 11. Zinc availability ppm.
 12. Copper ppm.
 13. Sodium ppm and sodium absorption ratio.
 14. Soluble-salts ppm.
 15. Presence and quantities of problem materials including salts and metals cited in the Standard protocol. If such problem materials are present, provide additional recommendations for corrective action.
 16. Other deleterious materials, including their characteristics and content of each.
- E. Organic-Matter Content: Analysis using loss-by-ignition method according to SSSA's "Methods of Soil Analysis - Part 3- Chemical Methods."
- F. Recommendations: Based on the test results, state recommendations for soil treatments and soil amendments to be incorporated to produce satisfactory planting soil suitable for healthy, viable plants indicated. Include, at a minimum, recommendations for nitrogen, phosphorous, and potassium fertilization, and for micronutrients.
1. Fertilizers and Soil Amendment Rates: State recommendations in weight [per 1000 sq. ft. (100 sq. m) for 6-inch (150-mm).
 2. Soil Reaction: State the recommended liming rates for raising pH or sulfur for lowering pH according to the buffered acidity or buffered alkalinity in weight [per 1000 sq. ft. (100 sq. m) for 6-inch (150-mm).

708.2 Materials

A. Plant Topsoil Materials

Use plant topsoil that meets the requirements of Subsection 893.2.01.

In addition to Section 893 - Stockpiled or On-Site Soil:

1. Excavation: Excavate soil from designated area(s) to a depth of 6 inches (150 mm) unless otherwise specified on the plans and stockpile until amended. Provide soil test results and amend as necessary. Provide amended soil test results and samples for approval by engineer prior to spreading on-site.
2. Unacceptable Materials: Clean soil of concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials that are harmful to plant growth.
3. Unsuitable Materials: Clean soil to contain a maximum of 8 percent by dry weight of stones, roots, plants, sod, clay lumps, and pockets of coarse sand. Screening Pass unamended soil through a 2-inch (50-mm) sieve to remove large materials.

B. Sources of Material

Except as modified in this Section, furnish plant topsoil material according to Section 106.

1. Plant Topsoil Obtained from the Work

The requirements of Subsection 104.06, "Right in and Use of Material Found on the Work" are in effect for plant topsoil obtained from the Work.

- a. Obtain the quantity of plant topsoil called for on the Plans.
- b. Use plant topsoil material present on the Project as long as the topsoil meets the Specifications applying to the Item.
- c. Excavate for topsoil only within the construction limits of the Project. Obtain topsoil from embankment areas, excavation areas, or borrow excavation pits.
- d. When obtaining plant topsoil from borrow excavation pits or the roadway, cross section the excavated areas a second time before beginning regular excavation.

2. Plant Topsoil Furnished by the Contractor

When insufficient material is obtainable from the Work, obtain additional topsoil offsite.

The Contract Price will include the costs necessary to locate, purchase, and deliver the required amount of acceptable material to the Work.

708.2.01 Delivery, Storage, and Handling

For the purpose of measurement, the Contractor may haul plant topsoil in any type of vehicle, provided the vehicle when loaded to capacity and traveling over public roads and streets meets the provisions of Subsection 107.14, "Load Restrictions."

When using pans or scrapers, the capacity will be the manufacturer's rated capacity.

Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and compliance with state and Federal laws if applicable.

Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Do not move or handle materials when they are wet or frozen.
4. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.

708.3 Construction Requirements

708.3.1 Personnel

General Provisions 101 through 150.

708.3.2 Equipment

General Provisions 101 through 150.

708.3.3 Preparation

General Provisions 101 through 150.

708.3.4 Fabrication

General Provisions 101 through 150.

708.3.5 Construction

A. General Requirements

Unless otherwise specified in the Plans, uniformly spread plant topsoil to at least 2 in (50 mm) loose depth.

1. Erosion Control

Unless otherwise specified in the Plans, only use plant topsoil on slopes where the gradient is 3:1 or flatter.

To reduce loss of plant topsoil by erosion, place the soil shortly before and in conjunction with grassing operations. Place topsoil and complete grassing within specified seasonal limits.

2. Spreading Procedure

Before applying plant topsoil, scarify the designated areas 6 in to 8 in (150 mm to 200 mm) deep.

Mix the plant topsoil, lime when required, and the first application fertilizer with the underlying soil when preparing the soil for grassing. Spread and smooth the topsoil uniformly.

B. Plant Topsoil Obtained From The Work

1. Stockpiling

When obtaining topsoil from the work site, strip and stockpile the topsoil in suitable locations in advance of grading operations.

Just before grassing, remove the plant topsoil from the stockpile and spread it over the designated areas.

If grassing is started before grading operations are finished, if feasible, haul the topsoil from undisturbed areas before grading begins directly to the areas designated for the topsoil, eliminating the cost of stockpiling and removing the stockpile.

2. Surplus Material

When stockpiling more material than specified in the Contract, use the surplus material as additional plant topsoil material if directed by the Engineer.

After constructing the Item, use the surplus material left in the stockpiles to maintain the Item or to fill washes that occur within a reasonable haul distance.

Otherwise, remove or dress down the remaining material as directed by the Engineer, without additional compensation.

C. Plant Topsoil Furnished by Contractor

When locating, obtaining, and paying for plant topsoil from pits outside the right-of-way, excavate the topsoil and haul it directly to the designated areas just before the planting begins.

Notify the Engineer, according to Subsection 893.2.01, "Plant Topsoil," of the source of the material. The Engineer will inspect the topsoil. If the material is suitable, the Engineer will specify the permissible excavation depth. If the permissible excavation depth is exceeded, the material obtained from the areas will be rejected.

708.3.6 Quality Acceptance

After placing the plant topsoil, replace material lost by erosion at no expense to the Department.

708.3.7 Contractor Warranty and Maintenance

General Provisions 101 through 150.

708.4 Measurement

Accepted plant topsoil for this Item is measured by the cubic yard (meter) of material delivered in vehicles to the designated areas for plant topsoil. Only vehicles loaded to full capacity are measured for payment. No payment will be made for material delivered in partially filled vehicles.

Plant topsoil is not measured for payment when it is used for an Item that includes the cost of the plant topsoil in the price bid per Unit for the Item.

708.4.01 Limits

General Provisions 101 through 150.

708.5 Payment

Plant topsoil, eligible for payment, will be paid for at the Contract Unit Price per cubic yard (meter). Payment is full compensation for furnishing the material, removing objectionable matter from the material, loading and unloading, stockpiling and removing from the stockpile, hauling, spreading, preparing the ground, pulverizing, mixing, remixing, and for all maintenance.

Payment will be made under:

Item No. 708.	Plant topsoil	Per cubic yard (meter)
---------------	---------------	------------------------

708.5.01 Adjustments

General Provisions 101 through 150.

END OF SECTION

City of Canton Etowah River Park Trail Extension

SPECIAL PROVISION SECTION-999-9000 MISCELLANEOUS CONSTRUCTION ALLOWANCE

Supplemental to GDOT Standard Specification;

Pay Item No. 999-9000 is intended for Miscellaneous Construction Allowance, which may or may not be required to construct the project. The Allowance shall be directed by the City Engineer/Project Manager. The Contractor shall not be reimbursed for Miscellaneous Items, unless he has **in writing specific authorization to proceed with the work from the City of Canton City Engineer.**

In the event that the scope of the project, and therefore this contract, needs to be adjusted, either by adding or deducting work, The Contractor agrees to furnish all services, labor, material, demolition (removal), overhead, profit, insurance, tools, equipment, transportation, supervision and other items necessary to complete the installation of the additional construction items for **Unit Price that has been provided in the Bid Proposal Form.**

If the City request additional work to be performed that is not listed as a Unit Price in the Bid Proposal Form, the Contractor agrees to make every effort to negotiate an acceptable price with the City. If the City of Canton is unable to negotiate an agreeable price with the Contractor, the City of Canton reserves the right to negotiate both price and warranties with specialty contractors for the completion of the work. The Contractor will then be required to include the work that is authorized, and utilizing the City authorized specialty subcontractor. The additional work will be billed under the Miscellaneous Construction items.

Section 999.2 Payment for Miscellaneous Construction Items:

Payment will be only for amounts authorized and approved by the City Engineer.

Final Payment to the Contractor may or may not equal 100% of the Item No. 999-9000 Miscellaneous Construction Allowance included in the Bid Proposal Form.

At the completion of the project, the remaining balance of the Miscellaneous Construction Allowance, will be reduced from the Total Contract Amount.

The intended purpose of the 999-9000 Miscellaneous Construction Allowance is to be used for unforeseen conditions.